Coronavirus (COVID-19) vaccine certification: evidence paper update

November 2021

Scottish Government
Riaghaltas na h-Alba
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Contents

1. Executive Summary

This paper provides an update on the latest evidence relating to options for the vaccine certification scheme in Scotland. Evidence is drawn from available literature, from the first four weeks of the operation of the exiting scheme, from attitudinal data and from international experience.

Current state of the epidemic

The COVID-19 epidemic continues to pose considerable challenges, with case rates currently averaging around 3,000 per day, an increase from October. COVID-19 related acute hospital admissions have fluctuated over the past month but have recently started to decrease. Case rates and age standardised hospital admissions are considerably lower in vaccinated vs unvaccinated individuals.

Modelling indicates uncertainty over hospital occupancy and intensive care in the next four weeks. Hospitals are currently at, or very close to, capacity and have been in this position for many weeks now with several Health Boards operating within an environment of unprecedented pressure and heightened risk plus a requirement for military support. This is likely to be driven by COVID-19 cases and delayed discharges but also may reflect that patients with higher acuity are now requiring admission. As we prepare for winter, our primary and secondary health and social care services are facing arguably the most significant and increasing pressures and demands in the history of the NHS.

Vaccine uptake has progressed extremely well in the Scottish adult population with approximately 79% of 18 to 29 year olds and 77% of 16 to 17 year olds having received the first dose of the vaccine. Around 96% of people aged 40 and over have received two doses, but uptake of a second dose remains lower in people in their 30s (77.5%) and 18-29 (68.9%).

Existing vaccine certification scheme

The scheme was announced on 1 September 2021, and while there are emerging data on some of these effects, there is as yet incomplete information about the longer term effects on the pandemic, wider society, and the economy. The COVID status app has been downloaded 1.5 million times as of 13 November. 478,014 paper copies and 1.2 million PDF versions have also been downloaded. These figures do not represent unique users as the app can be used on several devices and paper/pdf copies produced several times by individuals. Vaccine uptake has slightly increased since the scheme was announced, although it is not possible to directly attribute rises to the introduction of certification. The proportion of those aged 12+ with a first dose rose from 86.0% to 90.5%. The proportion of those aged 12+ with a second dose rose from 77.6% to 82.2%.

Current situation in Europe

Cases, hospitalisations and deaths have been increasing in Europe since late September. Governments are increasing the strictness of, or reintroducing, interventions - including vaccine certification. Norway and Denmark have reintroduced vaccine certification in response to rising cases. Certification is widespread across other countries in Europe and

in some other parts of the world. In most cases these schemes include indoor hospitality and leisure facilities in addition to events and nightclubs currently certified in Scotland. The majority of comparator countries accept a negative antigen test or recovery as a condition of entry as well as vaccination, although a negative test is no longer accepted in Austria and some parts of Germany. Wales extended the scope of vaccine certification on 15 November to include cinemas, theatres and concert halls, where both a negative antigen test and vaccination status is accepted.

Extending the vaccine certification scheme

Looking at the approaches adopted in other countries and advice from SAGE, the potential approaches to extending the current Scottish scheme would be to: Extend the range of settings; include testing, either as an option or alongside vaccination; include recovery as well as testing or vaccination; timestamp for boosters to allow for waning.

There are no real life studies directly comparing the effect on transmission for certification schemes based on testing only, vaccination (or previous infection) only, or both. However, EMG/SPI-M/SPI-B (SAGE subgroups) state that all these approaches could be considered to increase the potential impact on transmission and vaccine uptake. There is evidence of vaccine waning in some groups. The effectiveness of certification over the next 4-6 weeks and across the festive season on transmission therefore depends on boosters being rolled out quickly. If booster take up is high, certification will retain its effectiveness against transmission until there is more waning.

Including testing as an alternative depends on the accuracy of the tests and how they will be used by the public. The optimal testing strategy in order to gain access to a higher risk setting would be to take the test as close as practically possible to entry. LFTs are less sensitive than PCR but have the advantage of providing rapid results, and SAGE has endorsed the benefits that rapid antigen testing (such as LFTs) could have on reducing transmission. Awareness and use of LFTs in Scotland is high. Opinion polling carried out by YouGov on 5/6 October indicated that almost nine in ten are aware that everyone can now access testing. 41% have ordered or collected self-administered LFD tests, an increase since late August (35%). Of those who have ordered or collected tests, nine in ten have used them.

It should be noted that proof of vaccination can be open to manipulation, including fake certificates. Some countries have implemented fines and prosecution for individuals found using counterfeit certificates and for businesses found not to be checking certificates. Including testing as part of the scheme could address some of these risks.

Public attitudes and societal impacts

A key objective of the certification scheme is to encourage vaccine take-up. For some vaccine hesitant people, vaccine passports are perceived to be a reason why they would get vaccinated in the future. However, for others, vaccine passports were seen as coercive measures to control the population and violate privacy.

YouGov polling from Oct 5/6 found that 74% of respondents agree that the certification scheme has advantages, in particular encouraging people to get vaccinated (52% agree), making venues and events safer places to visit (49% agree), and in helping to prevent businesses having to close (44% agree). Overall support for the scheme is 59%, with around a quarter (24%) opposing it and 13% neither supporting nor opposing. The most commonly selected disadvantage of the scheme (62% agree) is that people who are vaccinated can still be carrying the virus, followed by it will be difficult for venues and events to check (47%).

Certification may have advantages for people who are more vulnerable to COVID-19 such as those with pre-existing conditions who are still choosing to avoid places where they believe risks are higher. Conversely, unvaccinated groups and those who have been vaccinated but with a non-MHRA recognised vaccine (unless this recognition changes) would be excluded from premises that require certification. The harms associated with this along with any issues related to wider societal and equality impacts should be carefully examined via EQIA and CRWIA assessments.

Potential economic impact

If the certification scheme is expanded it would affect a wider range of sectors and activities. In addition if testing is added to the existing scheme this would have implications for those already included. An expansion or changes could affect: the events industry; the sports sector; late night venues; entertainment venues and hospitality venues. This represents a significant number of businesses and organisations across Scotland.

The picture on impacts on business from the existing certification scheme is still emerging. From feedback received to date, nightclubs and late night settings have reported implementation challenges and substantial turnover losses among members affected by certification. Trade bodies have highlighted concerns regarding potential cancellations of Christmas bookings and the potential impact of footfall losses from certification on financial viability of affected businesses.

Large events affected have experienced additional implementation costs and report reductions in ticket sales and reduced capacities associated with certification. Public awareness of certification has been mixed and concerns have been expressed about non-MHRA vaccines not being accepted. There are reports of drop offs in attendance compared to ticket sales, increased waiting time to access venues and anecdotal feedback of increased aggression towards security staff and stewards in some contexts. A small number of sporting events in Scotland have been affected by the existing scheme although there has been generally good compliance with certification requirements among those attending matches. Stakeholders have reported that additional stewarding has been necessary to implement certification as currently designed.

If the scheme were expanded, the sectors that would be affected by certification are also those that have been hard hit by the long periods of closures and limits on their operating capacity as a result of measures taken to address the pandemic. Some of the sectors potentially affected are also seasonal businesses, with a substantial portion of annual turnover being generated in December. Businesses will incur increased costs if certification is expanded. The magnitude of these costs will be closely linked to the level of enforcement expected from businesses, the footprint of venues and flow of customers at venues and events. There may also be impacts on suppliers and those involved in the organisation and staging of live events.

Conclusion

Scotland already has in place a range of baseline measures to reduce the likelihood of infectious people mixing with others and transmitting the virus, including wearing face coverings in indoor public settings, testing and isolation, providing contact details when going to certain venues, requirements for international travel and guidance on working from home. We also have vaccination and boosters. But to suppress the virus further we are now faced with a choice. This is to limit social contacts and the risk of infection by closing venues, limiting group sizes and advising people not to meet other. Alternatively we can enable people to meet up in a lower risk way by using certification to reduce the risk that an infectious person will be present in a higher risk setting.

The current vaccine certification scheme has been in operation for a number of weeks. Over that time it has likely contributed to a small rise in vaccinations amongst the younger age group. SAGE advise that including a wider range of settings may increase the usefulness of certification as a measure to reduce infection. Wider international evidence suggests that expanding the settings included in any certification scheme may encourage older individuals who are not yet vaccinated to take up the vaccine.
Including a wider range of settings may also lead to a better understanding of the fact that the pandemic is still with us and continues to present a current threat. It will introduce some costs for a wide range of businesses. However, in a situation where cases are rising and hospitals are operating at capacity it allows higher risk settings to remain open as safely as possible, and to continue to trade.
There are advantages of including evidence of a negative test as an alternative to proof of vaccination. It will ensure that individuals not able to provide evidence of certification (those vaccinated with a non-MHRA approved vaccine, for example) can gain access to venues and may also address concerns about counterfeit certification. However, LFTs have limitations regarding their sensitivity and even proof of a negative test cannot completely remove the risk that someone is carrying the virus. These factors, as well as the wider body of evidence in this report, need to be carefully considered in any decisions about extending or modifying the vaccine certification scheme in Scotland.

2. Background

Following on from the Covid status certification evidence paper published on 29 September this paper provides an update of the evidence available at 16 November focusing on the potential impact of a range of options for expanding the vaccination certification scheme.

It adopts a four harms approach covering the direct harms of COVID-19, the indirect health harms and the social and economic harms. Evidence is drawn from clinical and scientific literature, from the first four weeks of the operation of the exiting scheme, from attitudinal data and from international experience. The methodology adopted is outlined in **Annex A**

3. The current state of the epidemic.

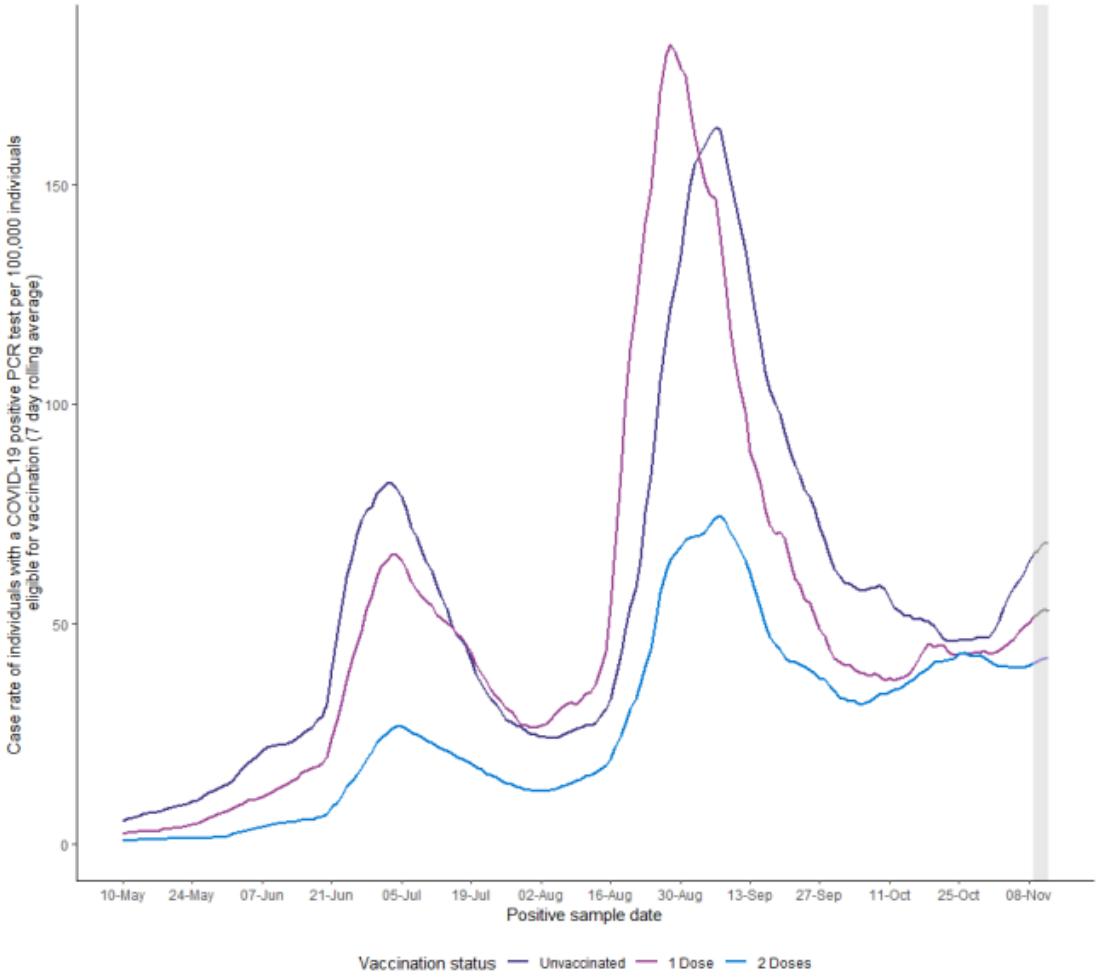
3.1 Cases, hospitalisations and deaths

In late August 2021, COVID-19 cases reached a higher peak than the last wave of cases in July 2021. Cases then declined and remained relatively stable throughout October but have started increasing in early November, and remain high across most local authorities[1]. Case rates are lower in fully vaccinated individuals, than unvaccinated and partially vaccinated individuals (Figure 1).

Cases remained broadly stable at around 2,500 new cases a day on average throughout October, but we have seen a gradual increase in cases over the past two weeks (ending 14 November) which are now at around 3,000 new cases a day. In the latest week (ending 14 November) cases increased across all age groups under 60, but fell for those 60+.

[1] COVID-19 Daily Dashboard | Tableau Public accessed on 17 November, data relate to 14 November

Figure 1: COVID-19 rate per 100,000 individuals eligible for vaccination by vaccination status, 7-day rolling average from 10 May 2021 to 12 November 2021.



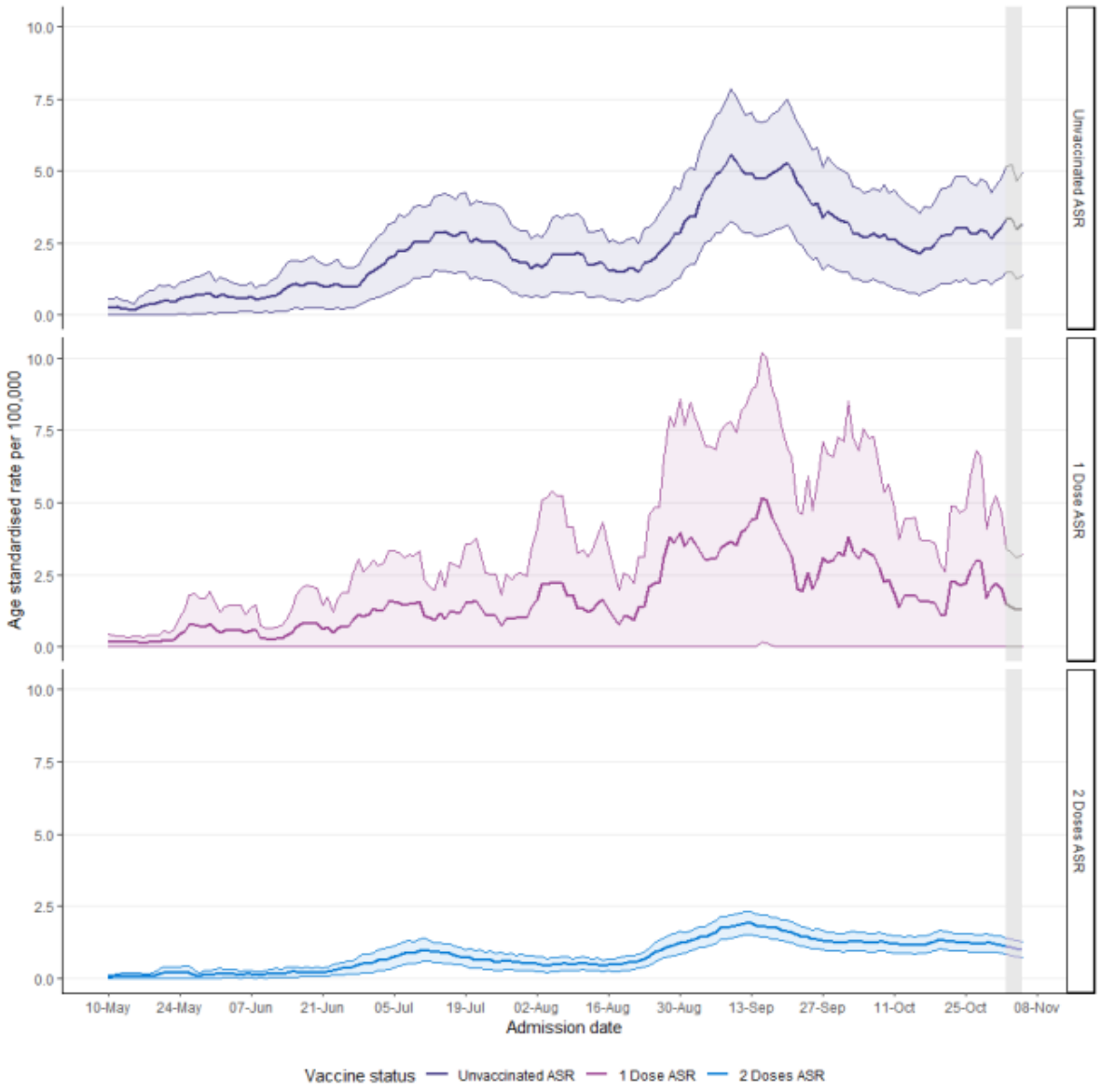
Note: Vaccination status is determined as at the date of PCR specimen date. The data displayed within the greyed-out section (3 days) are considered preliminary and are subject to change as more data is updated.

Source: Public Health Scotland - Scotland COVID-19 Statistical Report

COVID-19 related acute hospital admissions fluctuated over the past month but started to decrease[2]. Hospitalisation rates are higher among unvaccinated individuals (Figure 2).

Figure 2: Age-standardised hospitalisation rate of acute hospital admissions where an individual had a COVID-19 positive PCR test up to 14 days prior, on admission, or during their stay in hospital, per 100,000 individuals eligible for COVID-19 vaccination by vaccination status, seven-day rolling average from 10 May 2021 to 12 November 2021

[2] Source: Daily COVID-19 Cases in Scotland - Daily Case Trends By Health Board - Scottish Health and Social Care Open Data (nhs.scot) Accessed 28 September 2021 with data up to 24 September 2021.



Note: Vaccination status is determined as at the date of positive PCR test. The data displayed within the greyed-out section (1 week) are considered preliminary and are subject to change as more data is updated. 95% confidence intervals are shown as the shaded regions. Age-standardised hospitalisation rates are per 100,000 people per week, standardised to the 2013 European Standard Population.

Source: Public Health Scotland COVID-19 Statistical Report 22 September 2021

Of those individuals that have been fully vaccinated, from 29 December 2020 to 5 November 2021, 0.034% have died with COVID-19 recorded as an underlying or contributory cause of death[3].More information on the current situation as of 12th November in Scotland can be found in the Coronavirus (COVID-19) state of the epidemic 12 November 2021 - gov.scot (www.gov.scot) which is updated and published on a weekly basis[4].

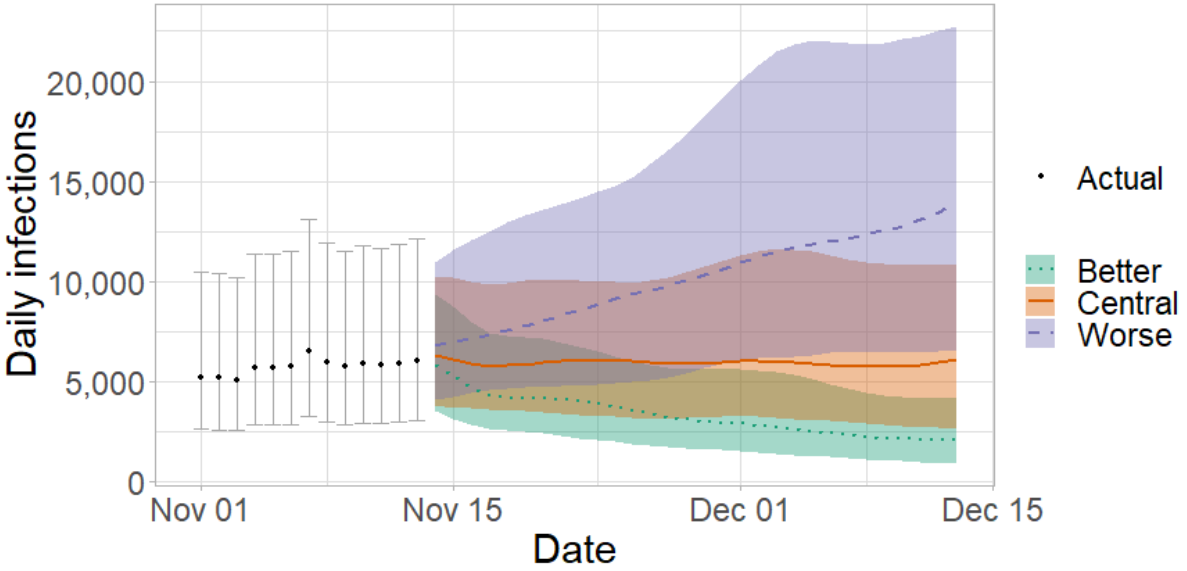
[3] Coronavirus (COVID-19): state of the epidemic - gov.scot (www.gov.scot)
[4] Coronavirus (COVID-19): state of the epidemic - gov.scot (www.gov.scot)

3.2 Forecasts for the medium term

Predictions of the impact of Covid-19 on the NHS in terms of estimated number of infections, hospitalisations and ICU over the coming weeks are modelled by Scottish Government analysts (Figures 3, 4 & 5) and show three projections over the four weeks to 13th December.

'Central' assumes that infections will rise or plateau at the current level, resulting from a small rise in transmission. 'Worse' assumes a larger rise in transmission from the current level. 'Better' assumes a small drop in transmission[5].

Figure 3: Medium term projections of modelled total new daily infections, adjusting positive tests[6] to account for asymptomatic and undetected infections, from Scottish Government modelling, based on positive test data reported up to 15th November.

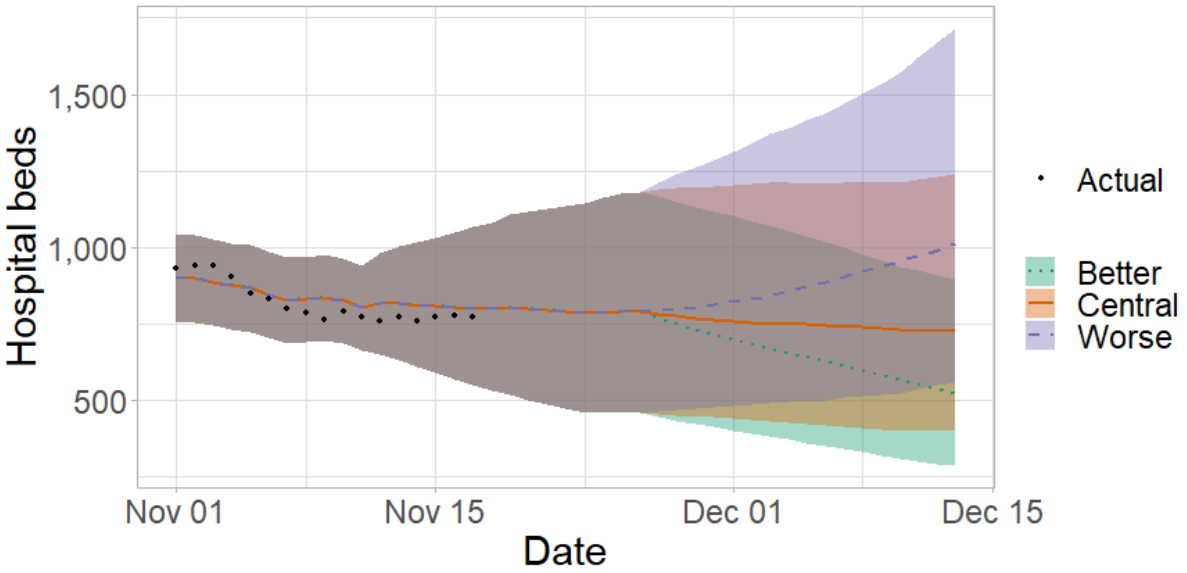


Source : Coronavirus (COVID-19): modelling the epidemic (issue no. 78) - gov.scot (www.gov.scot)

Figure 4 shows the impact of the projections on the number of people in hospital. The modelling includes all hospital stays, whereas the actuals only include stays up to 28 days duration that are linked to Covid-19. Hospital and ICU occupancies have plateaued. There continues to be uncertainty over hospital occupancy and intensive care in the next four weeks.

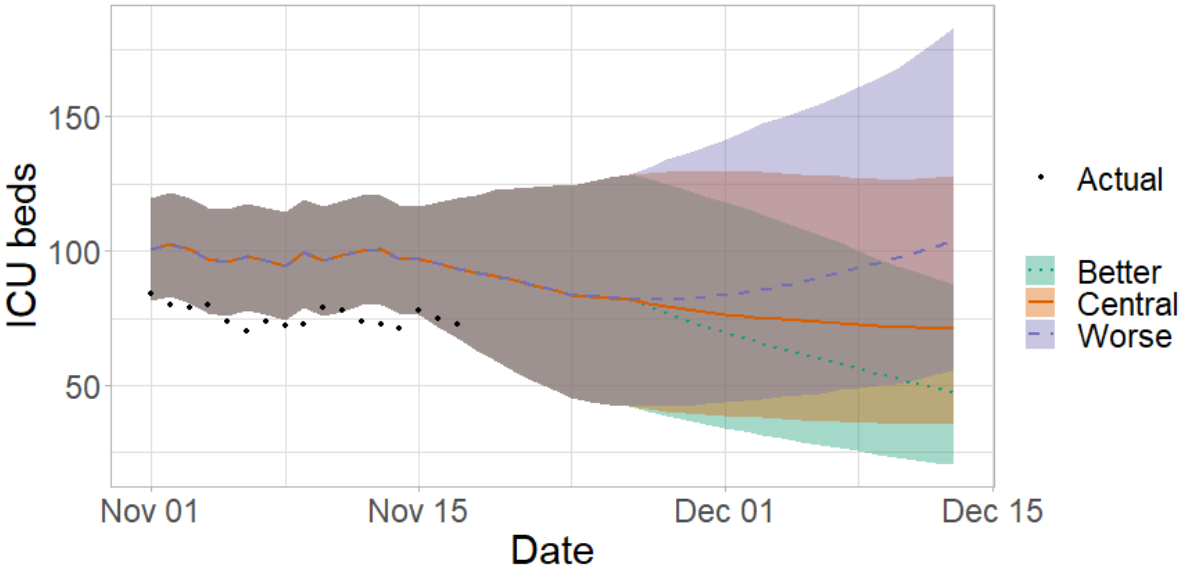
[5] All scenarios are based on current vaccine roll-out plans and efficacy assumptions. Data to 15th November.
[6] The actual positive tests are adjusted to coincide with the estimated day of infection.

Figure 4: Medium term projections of modelled hospital bed demand, from Scottish Government modelling, based on positive test data reported up to 15th November.



Source: [Coronavirus (COVID-19): modelling the epidemic (issue no. 78) - gov.scot (www.gov.scot)]

Figure 5: Medium term projections of modelled ICU bed demand, from Scottish Government modelling[7], based on positive test data reported up to 15th November.



Source: [Coronavirus (COVID-19): modelling the epidemic (issue no. 78) - gov.scot (www.gov.scot)]

[7] Actual data does not include full numbers of CPAP. ICU bed actuals include all ICU patients being treated for Covid-19 including those over 28 days.

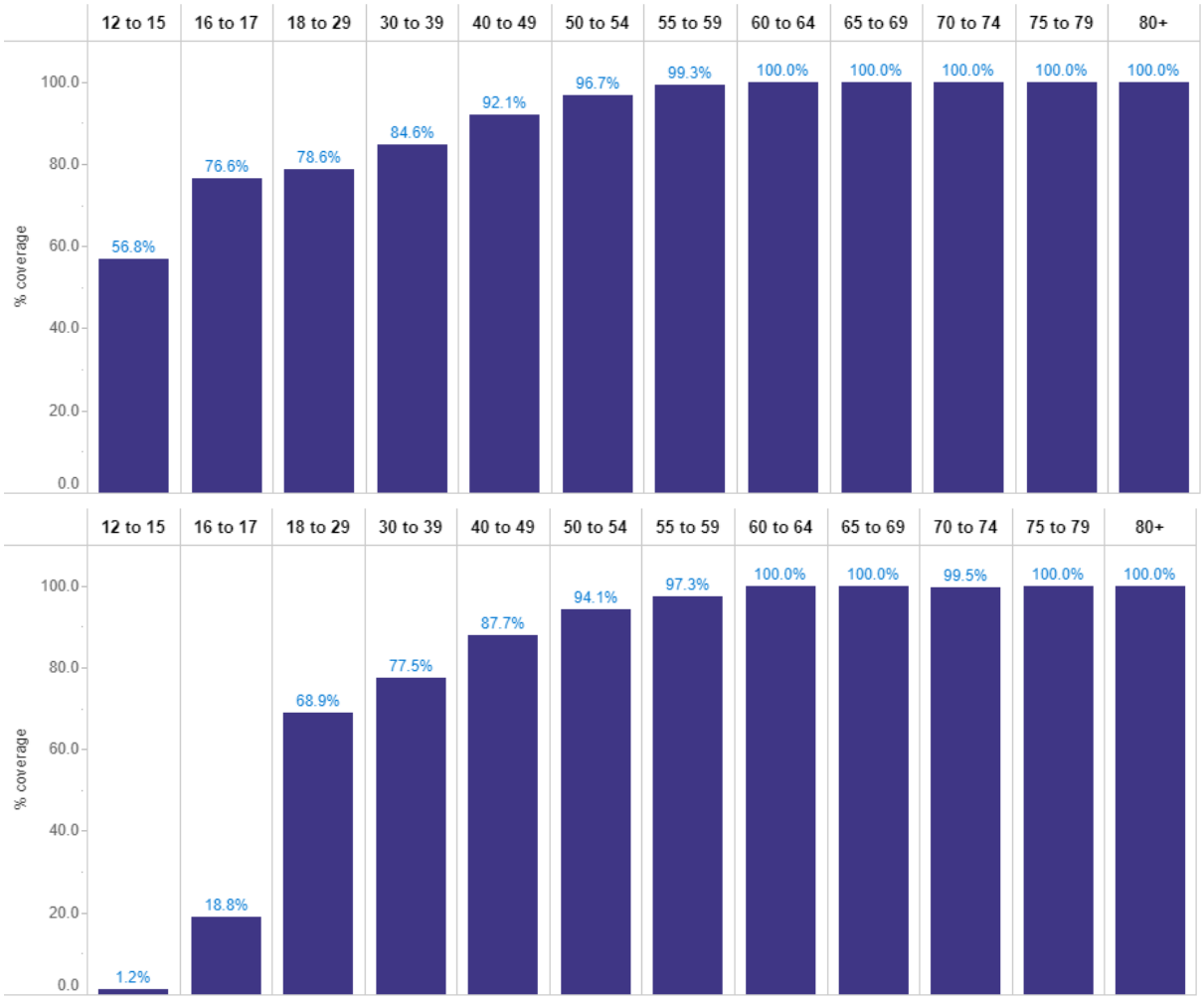
More information on the Scottish Government modelling can be found in the Coronavirus (COVID-19): modelling the epidemic in Scotland report which is updated and published on a weekly basis[8].

What the above predictions tell us is that there is still a degree of uncertainty about the future.

3.3 Vaccination progress

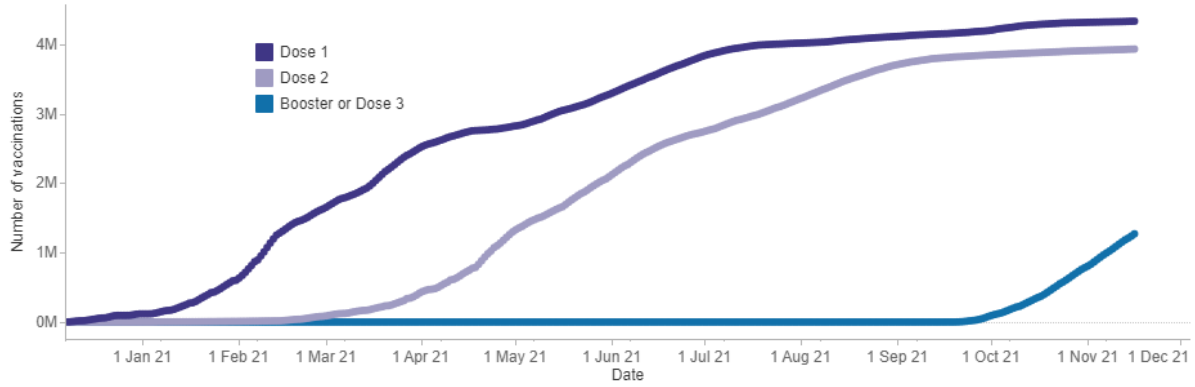
Vaccine uptake has progressed extremely well in the Scottish adult population with approximately 79% of 18 to 29 year olds and 77% of 16 to 17 year olds having received the first dose of the vaccine. Around 96% of people aged 40 and over have received two doses [9] [10], see Figure 6. This puts Scotland in a different position to a number of other countries where vaccination rates were much lower when certification was introduced.

Figure 6: Total Dose 1 (first chart) and Dose 2 (second chart) % coverage by age group in Scotland



[8] Coronavirus (COVID-19): modelling the epidemic - gov.scot (www.gov.scot)
[9] COVID-19 Daily Dashboard | Tableau Public accessed on 27 September, data relate to 26 September
[10] COVID-19 Vaccination in Scotland - Daily Trend of Vaccinations by Age Group and Sex - Scottish Health and Social Care Open Data (nhs.scot) accessed on 28 September, data relate to 26 September

Figure 7: Cumulative total number of vaccinations by dose in Scotland



Source: COVID-19 Daily Dashboard | Tableau Public. Updated 17 November 2021, data related to 16 November

Projections of vaccination activity over the coming weeks in combination with estimated cohort sizes suggests a first dose coverage of the 16-40 year old population of around 81.5% and a second dose coverage of around 69.2% by early December. For over 40 year olds first and second dose coverage is projected to be around 98.4% and 97.1% respectively by early December.

3.4 The impact on the Health service

The COVID-19 pandemic is having an impact on health and social care in Scotland in a number of ways. Demand continues to be very significant, with general demand mirroring levels experienced during pre-Covid-19 winter months. However, it is important to note that the NHS and social care system is responding to these pressures within an environment constrained by Covid-19 and with sustained level of Covid-19 cases and occupancies. Pressures are driven in part by society returning to more normality and patients feeling more comfortable to use health and care services again as well as a significant level of acute and ICU capacity re-directed to caring for Covid-19 cases.

Urgent care, in terms of A&E and acute beds, has been the subject of significant pressures over many months. This is likely to be driven, at least in part, by Covid-19 cases and delayed discharges but also may reflect that patients with higher acuity are now attending A&E, requiring admission. In December 2020, when there were around 1,000 COVID patients in hospital, there were around 19,000 A&E attendances per week; now A&E attendances are around 24,000 per week. From the summer of 2021, performance against the A&E four hour standard has dropped below 80% and has remained at this rate for a prolonged period of time. During week ending 31 October 2021, 71.4% of attendances at A&E services were seen and resulted in a subsequent admission, transfer or discharge within 4 hours[11].

[11] NHS Performs - weekly update of emergency department activity and waiting time statistics - Week ending 31 October 2021 - NHS Performs - weekly update of emergency department activity and waiting time statistics - Publications - Public Health Scotland

Hospitals are currently at, or very close to, capacity and have been in this position for many weeks now with several Health Boards operating within an environment of unprecedented pressure and heightened risk plus a requirement for military support. This affects how people are using those services, and how this impacts on health, demonstrated by the fact that there is a growing backlog in care developing. Since the onset of the pandemic (April 20-June 21), 46.8% fewer elective inpatient and day case patients have been seen compared to pre-pandemic (April 18-June 19); this represents approximately 164,000 patients in total. For the quarter ending June 2021, inpatient and day case activity was at 72.8% of pre-Covid levels (June 2019) and in the quarter ending June 2020 activity was at 20.7% of pre-Covid levels (June 2019)[12]. Statistics for the period up to the of end September 2021 will be published on 30 November 2021.

As we prepare for winter, our primary and secondary health and social care services are facing arguably the most significant and increasing pressures and demands in the history of the NHS. Whilst the number of people in hospital with recently confirmed COVID-19 has decreased from the recent high in mid-September, it remains stubbornly high and the future trend is uncertain. The rapid rise in Covid-19 cases and hospitalisations in Scotland between late August and early September justified the need to take action to reduce transmission in high risk settings in order to reduce the risk of serious illness and death and alleviate pressures on the NHS.

There is uncertainty as to how much Covid-19 infections will increase or decrease in coming weeks. As we move into the traditionally challenging winter months, Hospital and ICU Covid-19 occupancies appear to be plateauing but the scale of any future change in hospital occupancy and intensive care use is highly uncertain, and depends on the number of infections[13] and the success of the booster programme.

4. The existing vaccination certification scheme

Monitoring the scheme involves addressing a range of questions, including the implementation and use of the new systems; the impact against the stated aims of the scheme;[14] and the other immediate and longer term effects of the policy.

A range of information and data are relevant to these questions, including information about public knowledge and support for the scheme, confidence in the potential effectiveness, the changes in numbers of COVID cases, vaccination rates and health system impacts, and the impacts on human rights and equalities for people and groups.

The scheme was announced on 1 September 2021, and whilst there is emerging data on some of these effects, there is as yet incomplete information about the longer term effects on the pandemic, wider society, and the economy.

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[12] Stage of treatment waiting times - Inpatients, day cases and new outpatients 31 August 2021 - NHS waiting times - stage of treatment - Publications - Public Health Scotland

[13] Coronavirus (COVID-19): modelling the epidemic in Scotland (Issue No. 69) (www.gov.scot)

[14] The aims of the scheme were to: i) reduce risk of transmission, ii) reduce risk of serious illness and death and in doing so alleviate pressure on the healthcare system, iii) act as a first line defence to allow high risk settings to continue to operate as an alternative to closure or more restrictive measures, iv) increase vaccine uptake.

Given the fast changing nature of the pandemic and the multi-faceted response to COVID-19 it is challenging to isolate the effects of any one intervention, but data can provide insight into some of the monitoring questions.

4.1 System use

System use data shows large scale use of the app, and requests for paper and PDF copies.

As of midnight 13 November 2021 the NHS Covid Status App has been downloaded 1,571,575 times. It is important to note a single user may choose to download the app on multiple devices, so this figure does not represent unique individuals.
Between 3 September 2021 (introduction of QR codes) and midnight 13 November 2021:

- 478,014 paper copies of COVID-19 Status have been requested. This may not represent unique users if an individual requests a second copy (for example if they have lost their paper copy).
- 1,205,549* PDF versions of COVID-19 Status have been downloaded. This provides a measure of the total number of times a new QR code has been generated via PDF. An individual can generate more than one successful QR code so the figure does not represent unique users.

*1st, 2nd, 3rd October data for PDFs is missing due to a technical error, we can reasonably estimate that there were 35,000 – 45,000 PDFs successfully generated PDFs in total for those three days.

4.2 Vaccination uptake

The certification scheme was announced at a point when there was a relatively high overall uptake of first and second doses.

A regular survey of public attitudes to COVID-19 has tracked attitudes to vaccination since September 2020[15]. A large majority of respondents said they were likely to be vaccinated and this is consistent with vaccination uptake data as the vaccination programme has rolled out.

In recent waves of the survey from September to November, high proportions of the very small percentage of the population who have not yet received a vaccination said they were unlikely to do so, and scored themselves 0-2 on a scale of 0-10. In November, just under three quarters (74%) of people who were yet to be vaccinated said they were very unlikely to be vaccinated.

This suggests that increasing first and second dose uptake is more challenging as the vaccination uptake rate increases.

Between the introduction of the scheme on 1 September and 16 November there has been a relatively small increase in the uptake of first doses, and a slightly higher uptake of

[15] Public attitudes to coronavirus: tracker - data tables - gov.scot (www.gov.scot) Opinion polling is carried out by YouGov for the Scottish Government: conducted fortnightly with a sample of c.1000 adults 18+ across Scotland – demographically and geographically representative of the online population; fieldwork conducted mainly Tuesday/Wednesday on the dates shown with a small number of interviews on the Thursday morning.

second doses for those aged 18+. The increase was higher in younger age groups, whose scheduled vaccinations came later in the rollout schedule.

The proportion of those aged 12+ with a **first dose** rose from 86.0% to 90.5% (4.5 percentage points). The proportion of those aged 12+ with a **second dose** rose from 77.6% to 82.2% (4.6 percentage points).

Figure 8: Vaccination Dose 1 and Dose 2 coverage by age group, 1 September (certification scheme announcement) to present, 16 November 2021[16].

Dose 1 - %	01/09/2021	16/11/2021	Percentage point change
12 to 15	3.4	56.8	53.4
16-17	50.9	76.6	25.7
18-29	74.6	78.6	4.0
30-39	82.4	84.6	2.2
40-49	91.1	92.1	1.0
50-54	96.3	96.7	0.4
55-59	99.0	99.3	0.3
60-64	101.9	102.1	0.2
65-69	101.4	101.5	0.1
70-74	100.6	100.7	0.1
75-79	104.3	104.4	0.1
80+	103.5	103.5	0.1

Dose 2 - %	01/09/2021	16/11/2021	Percentage point change
12 to 15	0.0	1.2	1.2
16-17	8.6	18.8	10.2
18-29	52.8	68.9	16.2
30-39	71.5	77.5	6.1
40-49	85.0	87.7	2.7
50-54	93.1	94.1	1.1
55-59	96.6	97.3	0.7
60-64	100.1	100.6	0.5
65-69	99.9	100.2	0.3
70-74	99.3	99.5	0.2
75-79	102.8	103.0	0.1
80+	100.4	100.5	0.1

Evidence from comparison with other UK nations suggests that there has been a relatively slight impact on uptake of vaccination since the scheme was introduced in Scotland on 1 September. The rate of overall increase in first and second doses, has been similar across 4 UK nations. All four nations were however starting from an already high level of vaccination uptake and coverage.

Between the announcement of the scheme and the present, first dose coverage has risen by 4.6 percentage points in Scotland, the highest rise of the four nations, and slightly higher than England, Wales and Northern Ireland.

For second doses, the biggest increase in uptake was in Northern Ireland (5.4 percentage points) and England (5.4 percentage points) and Scotland had a similar level of increase (4.9 percentage points).

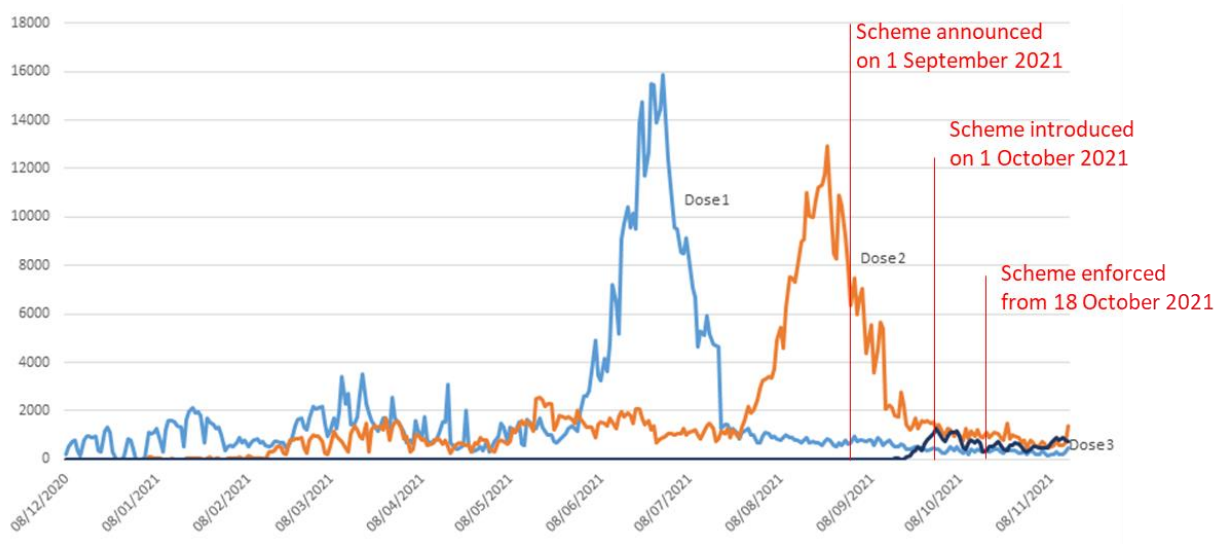
TABLE 1: Vaccination dose 1 and dose 2 coverage % and percentage point change, since the announcement of the certification scheme in Scotland on 1 September 2021 and 15 November 2021[17].

[16] COVID-19 Daily Dashboard | Tableau Public. NB percentages are calculated on population estimates, more information can be found here Coronavirus (COVID-19): vaccinations data – technical note - gov.scot (www.gov.scot)
[17] https://coronavirus.data.gov.uk/details/vaccinations

	1st dose coverage % 1 September	1st dose coverage % 15 November	**Percentage point change**
England	83.5	87.8	**4.3**
Northern Ireland	80.6	84.3	**3.7**
Scotland	86	90.6	**4.6**
Wales	85.6	89.4	**3.8**
	2nd dose coverage % 1 September	2nd dose coverage % 15 November	**Percentage point change**
England	74.4	79.8	**5.4**
Northern Ireland	72.9	78.6	**5.7**
Scotland	77.3	82.2	**4.9**
Wales	79.4	81.9	**2.5**

This is also shown in the data for younger age groups. The lowest level of vaccination coverage for first and second doses in adults has been in 18-29 year olds. At the point when the scheme was announced the uptake of vaccine was decreasing, and these trends have continued in the period since then.

Figure 9: Daily number of vaccines distributed to 18-29 year olds over time[18].



The rate of vaccination uptake for 18-29 year olds in Scotland between 1 September and 16 November 2021 is similar to the rate in England, where no certification scheme has been in place. Scotland was starting this time period from a higher baseline, so this represents important progress as the vaccination coverage reaches an upper plateau.

[18] https://public.tableau.com/profile/phs.covid.19

In Scotland the first dose coverage rose by 4.0 percentage points, (from 74.6% on 1 September 2021, to 78.6% on 16 November). The second dose rose by 16.2 percentage points, (from 52.8% on 1 September 2021, to 68.9% on 16 November 2021).

In England (where no certification scheme was in place) the first dose uptake rose by 3.0 percentage points (from 72.2% on 1 September to 75.2% on 16 November). The second dose uptake rose by 16.5 percentage points (from 49.7% on 1 September to 66.2% on 16 November).

Research into public attitudes carried out by YouGov for the Scottish Government, on 2/3 November 2021, (n=1002 people in Scotland) highlighted attitudes towards vaccination. The proportion of people surveyed who said they have been vaccinated for COVID-19 is high. 91% of all respondents have already received at least their first vaccine dose. Of those not vaccinated (and small base must be noted), 6% report they are likely to be vaccinated when a vaccine becomes available to them[19].

On 19/20 October[20], 87% of those who have had their first and second dose stated they are likely to have a booster vaccine when it is offered.

UK-wide research suggests that, while general willingness to get vaccinated is high, vaccine hesitancy (the "reluctance or refusal to vaccinate despite the availability of vaccines") is inversely related to age, as 16–24 year olds are 1.48 more likely to be vaccine hesitant than those aged 45–54 years[21] Scottish polling conducted in 19/20 October 2021[22] found that, among those awaiting their first, second or booster vaccination, 75% of 18-44 year olds were 'likely' to take it, compared to 89% of those aged 50 and over.

UK-wide analysis suggests that vaccine hesitancy has decreased slightly among younger age groups. The ONS Opinions and Lifestyle Survey[23] conducted June-July 2021, found vaccine hesitancy was:

- 11% among those aged 16 to 17 years (14% previously in the ONS survey conducted January-February 2021),
- 5% among those aged 18 to 21 years (9% previously)
- 9% among those aged 22 to 25 years (10% previously).

5. The current situation in Europe

Cases, and subsequent hospitalisations and deaths have been increasing in Europe since late September (Figure 10). In response, governments are increasing the strictness or

[19] Source: YouGov online survey. Total sample size on 2-4 November was 1002 adults. Sample size for those who have not yet received their first vaccine was 45 adults. 'Likely' to be vaccinated refers to respondents who rated themselves 8 to 10 on a scale of 0-10 for the question: How likely or unlikely are you to be vaccinated for COVID-19 when a vaccine becomes available to you? (Please select a number between 0 and 10, where 0 means 'extremely unlikely' and 10 means 'extremely likely')

[20] Total likely was those who score 8-10 on a scale. For full data table see: Public attitudes to coronavirus: tracker - data tables - gov.scot (www.gov.scot)

[21] [21] Robertson, E. et al (2021). Predictors of COVID-19 vaccine hesitancy in the UK household longitudinal study. Brain, Behavior, and Immunity, Volume 94
2021, p. 41-50.

[22] Public attitudes to coronavirus: tracker - data tables - gov.scot (www.gov.scot)

[23] Coronavirus and vaccine hesitancy, Great Britain - Office for National Statistics (ons.gov.uk)

reintroducing NPIs, including vaccine certification. For example, the scope of vaccine certification was extended on 15 November in Wales to include cinemas, theatres and concert halls, where both a negative antigen test and vaccination status is accepted[24]. England and Northern Ireland have vaccine certification included in their 'Plan B' contingency plans[25] [26].

Norway had previously ended their certification scheme on 7 October 2021 due to a reduction in case numbers. However, since then, cases have increased and the Government announced that vaccine passports, along with booster vaccination, will be returning to bars, restaurants, concert venues, sports stadiums, cinemas, theatres and museums[27] [28]. Similarly in Denmark, after stopping their certification on 10 September 2021, they reintroduced certification on 12 November due to rising case numbers[29].

As seen in Table 2, the majority of comparator countries accept a negative antigen test or recovery as a condition of entry, as well as vaccination. In Austria, a negative test has recently been removed as a condition of entry to encourage vaccine uptake[30] [31]. In some German states, a negative test has also been removed to be able to access some venues, known as the 2G rule. In Saxony, Bayern (Bavaria) and Berlin negative tests are not included in certification for access to indoor hospitality, leisure facilities and nightclubs[32] [33]. On 17 November, Baden-Württemberg entered their 'alert level', implementing the 2G rule in venues, including theatres, concert, cultural institutions, leisure facilities, nightclubs and indoor hospitality[34] [35]. In Hamburg, the implementation of the 2G rule is the choice of the facility and business owner[36].

The length of time vaccination status is able to be used to access a certificate varies between the comparator countries. Israel have already included booster doses in their vaccination status for the green pass. All passes were deactivated on 3 October 2021 with new applications using vaccine status requiring either the booster dose or to be within 6 months of their second dose[37]. France have recently announced that, as of December 15, people over 65 who were vaccinated with Johnson & Johnson must have had their booster or their QR code will be deactivated automatically. This will be extended at the beginning of December to those aged 50 to 64[38]. Austria have also introduced a 9 month expiry date for two dose vaccinations. Those vaccinated with Johnson & Johnson will have their

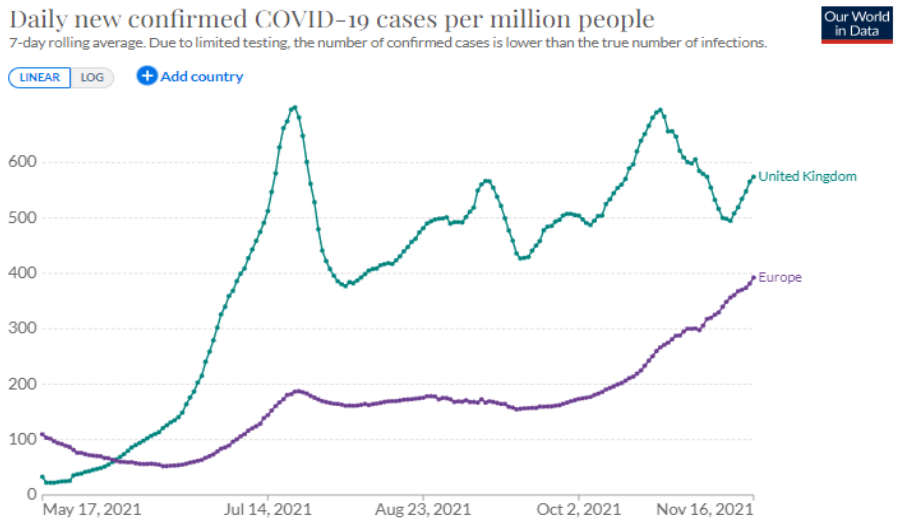
[24] COVID Pass: guidance for businesses and events [HTML] | GOV.WALES
[25] Guidance overview: COVID-19 Response: Autumn and Winter Plan 2021 - GOV.UK (www.gov.uk)
[26] NI Executive Autumn/Winder COVID-19 Contingency Plan (executiveoffice-ni.gov.uk)
[27] Local measures offer the best results - regjeringen.no
[28] Pressekonferanse om koronasituasjonen - regjeringen.no
[29] Corona passport in Denmark - where and when? (coronasmitte.dk)
[30] Safe travels in times of Coronavirus: How Austria's entry tests work
[31] Federal Chancellor Schallenberg: Nationwide lockdown for the unvaccinated - Federal Chancellery of Austria (bundeskanzleramt.gv.at)
[32] Coronavirus | City of Dresden
[33] Frequently Asked Questions - Bavarian State Ministry of the Interior, for Sport and Integration (bayern.de)
[34] Current information about Corona: Baden-Württemberg.de (baden-wuerttemberg.de)
[35] Coronavirus rules as of 15 October 2021.pdf (baden-wuerttemberg.de)
[36] What's Important: COVID-19 Regulations in Hamburg - hamburg.com
[37] Request Ministry of Health Documents - Corona Traffic Light Model (Ramzor) Website
[38] Info Coronavirus Covid-19 - "Health Pass" | Gouvernement.fr

certificates expire on 3 January 2022 if they have not had a booster[39].The other compactor countries range from a year validity to not providing an expiry date[40] [41] [42] [43] [44] [45] [46] [47].

The scope included in certification is also greater in comparator countries compared to Scotland, as seen in Table 3. The majority require certification for indoor hospitality and leisure facilities in addition to events and nightclubs current certified in Scotland. In addition to the compactor countries in the table below, other EU countries which require hospitality green pass (proof of vaccination, recent test or previous infection) for access to indoor hospitality spaces and/or cultural and sport venues include Cyprus, Finland, Greece, Latvia, Luxembourg, Portugal, Romania and Slovenia[48] [49] [50].

Beyond certification, Austria implemented a lockdown for unvaccinated individuals on 15 November[51]. In Upper Austria, bars and nightclubs have been closed and events cancelled until 5 December[52]. The Netherlands introduced a partial lockdown beginning 13 November, with bars, restaurants and non-essential stores ordered to close early for at least three weeks[53]. Germany's lower house have voted in favour of implementing a 2G rule on public transport and workplaces[54]

Figure 10: Daily new confirmed cases per million in the UK and Europe since 17 May 2021. Source: Coronavirus (COVID-19) Cases - Statistics and Research - Our World in Data Accessed: 17 November 2021



[39] Safe travels in times of Coronavirus: How Austria's entry tests work
[40] Covidsafe | Frequently Asked Questions
[41] Request your Covid certificate to travel Covid-safe - coronavirus.brussels
[42] Corona passport questions - COVID-19 vaccination - sundhed.dk
[43] COVID-19 restrictions in Ireland (citizensinformation.ie)
[44] Home - COVID-19 Green Certification (dgc.gov.it)
[45] Requirements and validity proof of vaccination | Coronavirus COVID-19 | Government.nl
[46] Proof of COVID-19 vaccination | COVID-19 (coronavirus) in Ontario
[47] Get your NHS COVID Pass | GOV.WALES
[48] Green pass: Which countries in Europe are asking tourists for them right now? | Euronews
[49] Finland approves Covid pass | News | Yle Uutiset
[50] Romania tightens COVID-19 restrictions as cases surge | Reuters
[51] Federal Chancellor Schallenberg: Nationwide lockdown for the unvaccinated - Federal Chancellery of Austria (bundeskanzleramt.gv.at)
[52] Corona rules for gastronomy (upperaustria.com)
[53] Infection rate must go down: stricter rules to limit person-to-person contacts | News item | Government.nl
[54] Covid: Germany to place tighter curbs on unvaccinated - BBC News

Table 2: COVID-19 certification validity in Scotland and comparator countries. Correct as of 17 November 2021					
Country	Certification Name	Certification Validity			
		Vaccination	PCR test	Rapid Antigen Test	Recovery
Scotland[55]	COVID-19 vaccination certification scheme	Full +14 days	Not included	Not included	Not included
Austria[56]	Gruner Pass (Green Pass)	Full (+22 days for J&J)	Not included	Not included	180 days
Belgium[57]	COVID Safe Ticket	Full	72h	48h	180 days
Denmark[58]	Coronapas	Full or 1 dose + 14 days	96h	72h	6 months
France[59]	Pass sanitaire	Full (+7 days or +28 for J&J) (+ booster for those after 65+ from 15 December 2021)	72h	48h	6 months
Germany[60]	CovPass/ Corona Warn App	Full +14 days	48h (not included in some states)	24h (not included in some states)	180 days
Iceland[61]	N/A – Testing scheme	Not included	Not included	48h (Certified only)	Not included
Ireland[62]	COVID-19 certification scheme	Full (+ additional days depending on vaccine)	Not included	Not included	6 months
Israel[63]	Green Pass	Full (+ booster for adults)	72h	24h	6 months
Italy[64]	Certificazione verde (Green Pass)	Full or partial	72h	48h	6 months

[55] Vaccine certification plans approved by Scottish Parliament - gov.scot (www.gov.scot)
[56] Safe travels in times of Coronavirus: How Austria's entry tests work
[57] Covidsafe | Frequently Asked Questions
[58] Corona passport in Denmark - where and when? (coronasmitte.dk)
[59] Info Coronavirus Covid-19 - "Health Pass" | Gouvernement.fr
[60] Coronavirus vaccination: protection for everyone – Federal Government (bundesregierung.de)
[61] covid19
[62] COVID-19 restrictions in Ireland (citizensinformation.ie)
[63] What is the Green Pass Scheme? - Corona Traffic Light Model (Ramzor) Website (health.gov.il)
[64] Home - COVID-19 Green Certification (dgc.gov.it)

Netherlands[65]	Corona Check	Full +14 days (+28 days for J&J)	24h	24h	180 days
Norway[66]	COVID-19 certificate	No longer in use			
Ontario, Canada[67]	Vaccine certification	Full	Not included	Not included	Not included
Wales[68]	COVID Pass	Full	Not included	48h	6 months

[65] Steps for getting a COVID Certificate for travel or events using CoronaCheck | Coronavirus COVID-19 | Government.nl
[66] About the Norwegian COVID-19 certificate - NIPH (fhi.no)
[67] Proof of COVID-19 vaccination | COVID-19 (coronavirus) in Ontario
[68] COVID Pass: guidance for businesses and events [HTML] | GOV.WALES

Table 3: Restricted activities requiring COVID-19 certification in Scotland and comparator countries. Correct as of 17 November 2021										
Country	Certification Name	Restricted activities								
		Indoor hospitality	Leisure facilities	Contact professions	Indoor events	Outdoor Events	Nightclubs	Gyms	Hospitals	Domestic travel
Scotland[69]	COVID-19 vaccination certification scheme				Y	Y	Y (late night venues)			
Austria[70]	Gruner Pass (Green Pass)	Y	Y	Y	Y	Y	Y	Y		
Belgium[71] [72] [73]	COVID Safe Ticket	Y	Y (Brussels)		Y	Y	Y (Brussels)	Y		
Denmark[74]	Coronapas	Y	Y		Y	Y	Y		Y	
France[75]	Pass sanitaire	Y	Y		Y	Y	Y	Y	Y	Y
Germany[76] [77] [78]	CovPass/ Corona Warn App	Y	Y (Berlin)	Y	Y	Y	Y (Berlin)	Y	Y	
Iceland[79]	N/A – Testing scheme				Y	Y				
Ireland[80]	COVID-19 certification scheme	Y	Y		Y		Y			
Israel[81]	Green Pass	Y	Y		Y	Y		Y		
Italy[82]	Certificazione verde (Green Pass)	Y	Y		Y	Y	Y	Y	Y	Y
Netherlands[83]	Corona Check	Y	Y		Y	Y	Y			
Norway[84]	COVID-19 certificate	No longer in use								
Ontario, Canada[85]	Vaccine certification	Y	Y		Y	Y	Y	Y		
Wales[86]	COVID Pass		Y		Y	Y	Y			

[69] Vaccine certification plans approved by Scottish Parliament - gov.scot (www.gov.scot)
[70] Safe travels in times of Coronavirus: How Austria's entry tests work
[71] Covidsafe | Frequently Asked Questions
[72] Consultative Committee - mandatory face masks, Covid Safe Ticket and teleworking in the fight against the autumn wave | Belgium.be
[73] Covid Safe Ticket (CST) in Brussels | City of Brussels
[74] Corona passport in Denmark - where and when? (coronasmitte.dk)
[75] Info Coronavirus Covid-19 - "Health Pass" | Gouvernement.fr
[76] Coronavirus vaccination: protection for everyone – Federal Government (bundesregierung.de)
[77] Measures against the corona virus - Berlin.de
[78] Events, meetings and cultural life - Berlin.de
[79] covid19

[80] COVID-19 restrictions in Ireland (citizensinformation.ie)
[81] What is the Green Pass Scheme? - Corona Traffic Light Model (Ramzor) Website (health.gov.il)
[82] Home - COVID-19 Green Certification (dgc.gov.it)
[83] Steps for getting a COVID Certificate for travel or events using CoronaCheck | Coronavirus COVID-19 | Government
[84] About the Norwegian COVID-19 certificate - NIPH (fhi.no)
[85] Proof of COVID-19 vaccination | COVID-19 (coronavirus) in Ontario
[86] COVID Pass: guidance for businesses and events [HTML] | GOV.WALES

Since the publication of the previous evidence paper some further research on the impact of certification across Europe has been produced. A study used a model comparing six countries (Denmark, Israel, Italy, France, Germany, Switzerland) that introduced certification (May-August 2021), with 20 control countries. The schemes used by the six countries were not vaccine only schemes as currently implemented in Scotland, and have different scopes to the current Scottish scheme. In some countries COVID-19 certification led to increased vaccinations 20 days prior to implementation, with a lasting effect up to 40 days after. Countries with lower than average pre-intervention uptake had a more pronounced increase (France, Italy, Israel). There was no effect in countries with higher uptake (Germany) or when introduced during limited supply (Denmark). The uptake was higher for <20 years and 20-29 years. Access restrictions linked to certain settings (nightclubs, events) were associated with higher uptake <20 years. When access restrictions were extended to broader settings, uptake remained high in the youngest group and increase was also observed in 30-49 age groups[87].

6. Alternative mitigation measures

A number of baseline measures are still in place in Scotland including:

- Wearing face coverings in public indoor settings including public transport.
- Providing your contact details when you go to places like pubs, cafes and restaurants.
- International travel – testing and quarantine requirements[88].

In addition guidance is still in place recommending working from home if possible.

In their latest paper on transmission, environmental and behavioural mitigation strategies, EMG and NERVTAG report that

Mitigations need to be applied together; enhancing one measure such as ventilation cannot fully compensate for the removal of other measures, especially if they address different transmission routes. There are no silver bullets. (high confidence).

They go on to identify the environmental and behavioural interventions that are likely to be most effective as:

- *Ensuring good airflow by interacting outdoors and improving poor indoor ventilation can mitigate airborne transmission (high confidence).*
- *Maintaining a greater distance between people can mitigate direct exposure to aerosols and droplets at close range where they are more concentrated (high confidence). Consideration and avoidance of small spaces or close interactions remains important. It is likely to be beneficial to reiterate the importance of physical distancing even in settings where restrictions on numbers of people have been removed.*

[87] S1401_University_of_Oxford_and_Nuffield_College_The_impact_of_mandatory_COVID-19_certificates_on_vaccine_uptake_Synthetic_Control_Modelling_of_Six_Countries__14_October_2021.pdf (publishing.service.gov.uk)
[88] Coronavirus (COVID-19): staying safe and protecting others - gov.scot (www.gov.scot)

- *Promoting high levels of wearing face coverings or face masks can potentially reduce transmission through all transmission routes, especially via close range and long-range airborne transmission (high confidence).*
- *Ensuring good hand and respiratory hygiene, limiting face touching and using face coverings are likely to reduce the small risks of fomite transmission. As transmission via surfaces is most likely to occur in a short time period following contamination, hand and respiratory hygiene is likely to be more effective than enhanced cleaning in most settings (medium confidence).* [89]

This mirrors the advice included in the SPI-M/SPI-B/EMG review of the UK Plan B which advises[90]

- Face coverings are likely to reduce transmission and are likely to be more effective when they are good quality and well-fitting [High confidence].
- Mandating the use of face coverings in appropriate situations is likely to increase usage [High confidence].
- Increasing vaccine uptake (including boosters) continues to be the most important measure to mitigate the health impacts of the SARS-CoV-2 epidemic in the UK.
- Other measures are available - for example encouraging wider use of rapid antigen testing in workplaces and the community, and ensuring self-isolation of those who test positive by providing sufficient support [High confidence].

SAGE also emphasise the importance of testing when symptomatic and staying at home with flu like symptoms[91].

The Juniper consortium analyse other measures that could be used during a high rise in infections, and considered that some will take longer (but have a lasting impact) which are listed first below, whilst other measures are more immediate (but less sustainable) listed last[92].

1. Improved ventilation in schools and workplaces
2. Improved public awareness
3. Boosters and increased vaccine uptake
4. Test, Trace and Isolate (TTI) (test and protect in Scotland)
5. Changes to restrictions and potential lockdowns
6. Antivirals 2 and pharmaceuticals.
7. Travel restrictions.

The current baseline measures and all those suggested by others aim to reduce the likelihood of infectious people mixing with others and infecting them. In a context

[89] Research and analysis overview: EMG and NERVTAG: Update on transmission and environmental and behavioural mitigation strategies, including in the context of Delta, 13 October 2021 - GOV.UK (www.gov.uk)
[90] S1393_SPI-B_SPI-M_EMG_Considerations_for_potential_impact_of_Plan_B_measures_13_October_2021.pdf (publishing.service.gov.uk)
[91] Research and analysis overview: Testing when symptomatic, and staying at home with influenza-like illness, during autumn and winter 2021, 30 September 2021 - GOV.UK (www.gov.uk)
[92] S1392_Juniper_Consortium_Control_Options_for_Mitigating_a_Rapid_Rise_in_Infection.pdf (publishing.service.gov.uk)

where social contacts are rising as shown by recent results of the Scottish Contact survey[93], reducing the risk from social interaction is essential.

We know that vaccinated individuals can still transmit the virus but we also know that vaccinated individuals are less likely to become infected or to become seriously ill and require hospitalisation.

SAGE noted in April 2021 that:

> *there are three main ways in which baseline measures can reduce transmission (from most to least effective)* [94]:

1. *Reducing the likelihood that people who are infectious mix with others.*

   The most effective baseline measures are likely to be ones which reduce infected people mixing, such as an effective test, trace and isolation system (high confidence)[95].

2. *For those potentially infectious people who are not isolated, reducing the likelihood that they enter higher risk settings or situations*

   EMG SPI-M advises that the next most effective baseline measures aim to eliminate or substitute some of the higher risk situations where transmission could occur. This could be by using a certification scheme based on negative testing, vaccination, or proof of prior infection[96]. Other important ways would be by minimising the frequency and duration of exposure such as encouraging outdoor interactions, working from home, and generally reducing the number, size, and duration of interactions[97].

3. *Decreasing the transmission risk from a potentially infectious person in any given environment*[98] [99]

   EMG SPI-M advises that to decrease the risk of transmission from an infectious person the following non pharmaceutical interventions (NPIs) should be considered: [100]

[93] Coronavirus (COVID-19): modelling the epidemic - gov.scot (www.gov.scot)
[94] SAGE 87 minutes: Coronavirus (COVID-19) response, 22 April 2021 - GOV.UK (www.gov.uk)
[95] EMG, SPI-M and SPI-B: Considerations in implementing long-term 'baseline' NPIs, 22 April 2021 - GOV.UK (www.gov.uk)
[96] EMG, SPI-M and SPI-B: Considerations in implementing long-term 'baseline' NPIs, 22 April 2021 - GOV.UK (www.gov.uk)
[97] EMG, SPI-M and SPI-B: Considerations in implementing long-term 'baseline' NPIs, 22 April 2021 - GOV.UK (www.gov.uk)
[98] SAGE 87 minutes: Coronavirus (COVID-19) response, 22 April 2021 - GOV.UK (www.gov.uk)
[99] EMG, SPI-M and SPI-B: Considerations in implementing long-term 'baseline' NPIs, 22 April 2021 - GOV.UK (www.gov.uk)
[100] EMG, SPI-M and SPI-B: Considerations in implementing long-term 'baseline' NPIs, 22 April 2021 - GOV.UK (www.gov.uk)

- Physical distancing (to reduce risk from respiratory droplets and short-range aerosols)[101] [102] [103]
- Ventilation (to reduce risk from long duration exposure and far-fields aerosol transmission)[104] [105] [106]
- Face coverings (to reduce emission of virus and exposure to droplets and larger aerosols)[107]. Other forms of barriers (e.g. Perspex screens) may provide some protection from droplets in some circumstances though consideration needs to be given to airflows, as in some cases they may increase risk of aerosol transmission.
- Hand hygiene and surface cleaning (to reduce risk from fomites)[108].

The 4 harms approach aims to develop the right package of measures that draws on the advice above but limits impacts on individual rights and broader societal or economic harms.

We already have in place measures such as vaccination and boosters, testing and isolation, mask wearing and hand hygiene. These address the first and third groups of mitigations and restrictions set out by SAGE. However, to address the second we have a choice of limiting social contacts by closing venues, limiting group sizes and advising people not to meet others or we can enable people to meet up in a lower risk way by using certification to reduce the risk that an infectious person will be present in a higher risk setting.

The vaccine certification scheme as proposed for Scotland is targeted towards higher risk settings or events and will be used in conjunction with the NPIs listed above[109] to further enhance the overall preventative impact. As part of this package of mitigation measures, a vaccine certification scheme should ensure that only fully vaccinated individuals are present at these events reducing the risk of infection and severe illness leading to hospitalisation amongst the attendees.

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[101]SAGE 40 https://www.gov.uk/government/publications/transmission-of-sars-cov-2-and-mitigating-measures-update-4-june-2020
[102] SAGE 51 https://www.gov.uk/government/publications/pheemg-aerosol-and-droplet-generation-from-singing-wind-instruments-and-performance-activities-13-august-2020
[103]SAGE 76 https://www.gov.uk/government/publications/emg-application-of-physical-distancing-and-fabric-face-coverings-in-mitigating-the-b117-variant-sars-cov-2-virus-in-public-workplace-and-community, 13 January 2021.
[104]SAGE 76 https://www.gov.uk/government/publications/emg-application-of-physical-distancing-and-fabric-face-coverings-in-mitigating-the-b117-variant-sars-cov-2-virus-in-public-workplace-and-community, 13 January 2021.
[105]SAGE 60 https://www.gov.uk/government/publications/sage-60-minutes-coronavirus-covid-19-response-1-october-2020
[106]SAGE 60 https://www.gov.uk/government/publications/emg-role-of-ventilation-in-controlling-sars-cov-2-transmission-30-september-2020
[107]SAGE 76 https://www.gov.uk/government/publications/emg-application-of-physical-distancing-and-fabric-face-coverings-in-mitigating-the-b117-variant-sars-cov-2-virus-in-public-workplace-and-community, 13 January 2021
[108] EMG, SPI-M and SPI-B: Considerations in implementing long-term 'baseline' NPIs, 22 April 2021 - GOV.UK (www.gov.uk)
[109] Coronavirus (COVID-19) vaccine certification scheme debate: Deputy First Minister's statement - 9 September 2021 - gov.scot (www.gov.scot)

SAGE considered with a medium confidence that a certification scheme could potentially have medium effectiveness[110]. However they also warned that *"*certificates should also not be used to replace other measures to protect high-risk individuals"[111].

Notably SAGE has suggested that "*the prevalence of infection in the community will have an important impact on the level of risk and effectiveness of certification which may be very effective when prevalence is low, but less effective at high prevalence*"[112]

7. Extending the vaccine certification scheme

The current Covid-19 vaccination certification scheme in Scotland aims to[113] [114] [115] [116]

- Reduce the risk of transmission (harm 1);
- Reduce the risk of serious illness and death and in doing so alleviate current and future pressure on the healthcare system (harm 1);
- Allow higher risk settings to continue to operate as an alternative to closure or more restrictive measures (harms 3 & 4); and
- Increase vaccine uptake (harm 1)

Looking at the approaches adopted in other countries and advice from SAGE[117], the potential approaches to extending the current Scottish scheme would be to:

- Extend the range of settings
- Include testing, either as an option or alongside vaccination
- Include recovery instead of testing or vaccination
- Timestamp for boosters to allow for waning.

There are no real life studies directly comparing the effect on transmission for certification schemes based on testing only, vaccination (or previous infection) only, or both. As outlined above in the international section of the paper different countries have adopted different approaches and have changed their approach over time.

[110] EMG, SPI-M and SPI-B: Considerations in implementing long-term 'baseline' NPIs, 22 April 2021 - GOV.UK (www.gov.uk)
[111] SAGE 79 minutes: Coronavirus (COVID-19) response, 4 February 2021 - GOV.UK (www.gov.uk)
[112] SAGE 79 minutes: Coronavirus (COVID-19) response, 4 February 2021 - GOV.UK (www.gov.uk)
[113] Coronavirus (COVID-19): mandatory vaccine certification - gov.scot (www.gov.scot)
[114] Coronavirus (COVID-19) vaccine certification scheme debate: Deputy First Minister's statement - 9 September 2021 - gov.scot (www.gov.scot)
[115] Vaccine certification plans approved by Scottish Parliament - gov.scot (www.gov.scot)
[116] Coronavirus (COVID-19) update: First Minister's statement – 14 September 2021 - gov.scot (www.gov.scot)
[117] S1393_SPI-B_SPI-M_EMG_Considerations_for_potential_impact_of_Plan_B_measures_13_October_2021.pdf (publishing.service.gov.uk)

7.1 Extending the range of settings

EMG/SPI-M/SPI-B have noted that certification based on vaccination status or prior infection would indirectly reduce the likelihood of an infected person being present as they would demonstrate some level of immunity[118]. They note that certification based on negative test results could reduce the likelihood of an infected person being present. However this would depend on the quality of the test and when the test was taken in relation to the event. They note that the practical and ethical issues need to be considered[119].

They state that increasing the range of applicable settings, time-limiting certificates based on last vaccination date, and including a requirement for proof of a negative test, could all be considered to increase the potential impact on transmission and vaccine uptake [120].

Extending the range of settings would increase the possibility of reducing transmission and would potentially encourage a wider range of people to take up vaccination as was noted above.[121]

7.2 Testing

Successfully including testing as an alternative depends on the accuracy of the tests and how they will be used by the public.

Two main testing methods exist for detection of SARS-CoV-2; LFT (lateral flow tests or devices) or RT-PCR. RT_PCR is the recommended testing method if you have COVID-19 symptoms while LFT is recommended only for people who do not have symptoms[122]. RT-PCR is a highly sensitive and specific technique to detect SARS-CoV-2 and is a recommended diagnostic testing method by the WHO[123]. Specificity and sensitivity levels of >95% have been reported by SAGE for RT-PCR testing[124].

LFD testing is effective at identifying people with the virus when they are at their most infectious and have high viral loads[125]. A peer-reviewed study on sensitivity of the LFDs carried out by the University College London found that LFDs are more than 80% effective at detecting any level of COVID-19 infection therefore can be an effective tool in reducing transmission[126]. Another study showed that LFDs are 95%

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[118] EMG, SPI-M and SPI-B: Considerations in implementing long-term 'baseline' NPIs, 22 April 2021 - GOV.UK (www.gov.uk)
[119] EMG, SPI-M and SPI-B: Considerations in implementing long-term 'baseline' NPIs, 22 April 2021 - GOV.UK (www.gov.uk)
[120] S1393_SPI-B_SPI-M_EMG_Considerations_for_potential_impact_of_Plan_B_measures_13_October_2021.pdf (publishing.service.gov.uk)
[121] S1401_University_of_Oxford_and_Nuffield_College_The_impact_of_mandatory_COVID-19_certificates_on_vaccine_uptake_Synthetic_Control_Modelling_of_Six_Countries__14_October_2021.pdf (publishing.service.gov.uk)
[122] Get tested for coronavirus (COVID-19) - NHS (www.nhs.uk)
[123] Diagnostic testing for SARS-CoV-2 infection (who.int)
[124] S0519_Impact_of_false_positives_and_negatives.pdf (publishing.service.gov.uk)
[125] Asymptomatic testing backed by new research studies - GOV.UK (www.gov.uk).
[126] SARS-CoV-2 antigen rapid lateral flow test (LFT) sensitivity | CLEP (dovepress.com)

effective and 89.1% specific at detecting COVID-19 when used at the onset of symptoms[127].

SAGE endorsed the benefits that rapid antigen testing could have on reducing transmission when discussing the UK Government Plan B options; '*Other measures are available which, if introduced, could also make Plan B (or more stringent measures) less likely (and could potentially offer better efficiency or effectiveness) for example encouraging wider use of rapid antigen testing in workplaces and the community, and ensuring self-isolation of those who test positive by providing sufficient support*'[128].

Clinical evaluations of LFTs by Public Health England (PHE) and University of Oxford reported a slight reduction in the LFT test sensitivity with nasal-only swabbing compared with the throat and nose swab test (88% vs 92% respectively). The sensitivity of the nasal-only swabbing was unaffected by the experience level of the operator[129]. Therefore LFT testing can be an effective measure in reducing transmission.

The optimal testing strategy in order to gain access to a high risk setting would be to take the test as close as practically possible before entry into the setting. This will have the best chance of detecting infectious individuals. RT-PCR samples need to be sent to a laboratory for processing and testing using expensive equipment, therefore the reporting of a result can take between 24 to 72 hours. In contrast a LFT is a rapid test, producing a result within 30 minutes. There are trade-offs between the lower sensitivity of lateral flow tests and the greater likelihood that more people will use them as they can be carried out at home quickly. Whether these trade-offs lead to a net beneficial or detrimental effect is unclear[130] .

Outside of testing for certification purposes the guidance for children and teachers is to currently test twice a week. Around 1 in 3 people with coronavirus do not show symptoms. Regular lateral flow testing is encouraged to find infectious, asymptomatic positive cases[131]. Evidence suggests that serial antigen testing every three days or twice a week will almost always identify SARS-CoV-2 during early stages of infection, and therefore significantly reduce transmission[132]. A longitudinal assessment of diagnostic test performance of RT-qPCR and LFT assays throughout an acute SARS-CoV-2 infection was studied. Recently infected adults (n=43) with mild or asymptomatic SARS-CoV-2 infections were tested daily using nasal and saliva samples. Both RT-qPCR and LFT peaked in sensitivity when live virus was detected in nasal swabs, but sensitivity of RT-qPCR tests was greater than LFT at detecting virus prior to the infectious period. All tests showed >98% sensitivity if used

[127] Comparing the diagnostic accuracy of point-of-care lateral flow antigen testing for SARS-CoV-2 with RT-PCR in primary care (REAP-2) - EClinicalMedicine (thelancet.com)
[128] S1393_SPI-B_SPI-M_EMG_Considerations_for_potential_impact_of_Plan_B_measures_13_October_2021.pdf (publishing.service.gov.uk)
[129] Asymptomatic testing for SARS-CoV-2 using antigen-detecting lateral flow devices: evidence from performance data October 2020 – May 2021 (publishing.service.gov.uk)
[130] Research and analysis overview: Testing when symptomatic, and staying at home with influenza-like illness, during autumn and winter 2021, 30 September 2021 - GOV.UK (www.gov.uk)
[131] Coronavirus (COVID-19): Get a test if you do not have symptoms | NHS inform
[132] Options for the use of rapid antigen tests for COVID-19 in the EU/EEA - first update (europa.eu)

at least every 3 days and daily screening using antigen tests can achieve approximately 90% sensitivity for identifying infected individuals while they are viral culture positive[133]. It would therefore be advantageous to routinely self-test multiple times per week to maximise early detection of virus and reduce transmission.

There is some evidence that COVID certification based on test results as well as vaccination status can be open to manipulation. The Netherlands implemented Covid-19 certification for nightclub entry on 26 June, 2021. Despite attempts to prevent unauthorised access unvaccinated and untested individuals were still able to gain entry due to end-user errors and oversight[134]. Subsequent rises in cases led to the closure of nightclubs again[135]. However, the government is currently developing support measures for nightclubs and discos to try to reopen[136].

Media reports increasingly note the problem of fake certificates[137] [138] [139]. Some countries have implemented fines and prosecution for individuals found using counterfeit certificates and for businesses found not to be checking certificates[140] [141].

7.3 Vaccine effectiveness

An expert consensus view of vaccines effectiveness against symptomatic disease in fully vaccinated people is between 45-95%, depending on the vaccine and when it was given[142] [143]. Evidence is not available on which type of certification scheme (testing or vaccination) would be most effective at reducing the likelihood of infected people being present at an event.

Vaccination reduces the chance of getting infected and uninfected people cannot transmit the virus, therefore, the vaccines are also effective at reducing transmission[144]. However, in breakthrough cases, where a vaccinated person becomes infected they may still pass the virus on. There is some evidence that at the peak of infection vaccinated and unvaccinated people have similar viral loads and a vaccinated person who is infected may be as likely to transmit virus to others as an unvaccinated person (High confidence)[145] . A UK cohort study found that the secondary attack rates (SAR) in household contacts exposed to the Delta variant

[133] Longitudinal Assessment of Diagnostic Test Performance Over the Course of Acute SARS-CoV-2 Infection | The Journal of Infectious Diseases | Oxford Academic (oup.com)
[134] False results and hacking: reopening of Dutch clubs proves to be problematic – DutchReview
[135] Netherlands lifted COVID restrictions too soon, PM apologizes | News | DW | 12.07.2021
[136] Netherlands to reopen further with coronavirus entry passes | News item | Government.nl
[137] Fake Covid vaccine and test certificate market is growing, researchers say | Coronavirus | The Guardian
[138] Can the US crack down on fake vaccination cards? - BBC News
[139] Fake COVID vaccine certificates sold on dark web for €150 | Euronews
[140] France forced to soften rules after coronavirus green pass backlash – POLITICO
[141] Proof of Vaccination Guidance for Businesses and Organizations under the Reopening Ontario Act (gov.on.ca)
[142] Research and analysis overview: VEEP: Vaccine effectiveness table, 24 September 2021 - GOV.UK (www.gov.uk)
[143] COVID-19 vaccine surveillance report - week 45 (publishing.service.gov.uk)
[144] COVID-19 vaccine surveillance report - week 45 (publishing.service.gov.uk)
[145] Research and analysis overview: EMG and NERVTAG: Update on transmission and environmental and behavioural mitigation strategies, including in the context of Delta, 13 October 2021 - GOV.UK (www.gov.uk)

was 25% (95% CI 18–33) for fully vaccinated individuals compared with 38% (24–53) in unvaccinated individuals. This indicates that fully vaccinated people with breakthrough infections can efficiently transmit infection in household settings, including to fully vaccinated contacts. However infected vaccinated people were slightly less likely to pass the virus on than infected unvaccinated people[146]. Analysis from the ONS Community Infection Survey concluded that vaccination reduces transmission of Delta, but by less than the Alpha variant and the impact of vaccination decreased over time[147].

7.4 Vaccine waning

The effectiveness of vaccination at reducing infections, symptomatic disease, severe disease, hospitalisation and death reduces with time after the second dose of the vaccine. Waning occurs from around 10 weeks post second dose and is most evident in older groups for symptomatic disease. Waning protection of the vaccine against hospitalisation and death is most evident in clinical risk groups [148].

Waning has a significant impact on the efficacy of certification as a useful measure to reduce the risk of transmission, symptomatic disease and hospitalisation.

Two real world studies from Israel found an increased rate of infection and severe disease for early vaccinated adults compared to those who were vaccinated later in the year. The first study analysed data from adults (n= 4,791,398 people) and found that among those fully vaccinated, rate ratios of infection two months after receiving the second dose of vaccine compared to the months when first fully vaccinated were: 1.6 for ≥60 years old, 1.7 for 40-59 years old's and 1.6 for 16-39 years old's. The rate ratios for severe disease were: 1.8 for ≥ 60, 2.2 for 40-59, insufficient data for 16-39[149]. The second study compared breakthrough infections in people ≥ 16 years old (n= 1,352,44 individuals) who received the second dose of the vaccine between January and April 2021. Researchers reported a significant increase in risk of infection among individual that were early vaccinated compared to those who were vaccinated later (1.51-fold, 95% CI, 1.38-1.66). The increase was similar across all age groups[150]. Results from both studies indicate that immunity against the Delta variant of SARS-CoV-2 waned in all age groups a few months after the receipt of the second dose of vaccine.

A recent, pre-published UK study looking at antibodies targeting the spike protein (anti-S antibodies) and breakthrough infections reported that those with anti-S levels of < 500 units (U)/ml following the second dose were nearly twice as likely to have a breakthrough infection compared to those with higher levels. Researchers estimated that antibody levels decline to this threshold after about 3 months in individuals that received a second dose of the Oxford-AstraZeneca vaccine and after about 7

[146] Community transmission and viral load kinetics of the SARS-CoV-2 delta (B.1.617.2) variant in vaccinated and unvaccinated individuals in the UK: a prospective, longitudinal, cohort study - The Lancet Infectious Diseases
[147] The impact of SARS-CoV-2 vaccination on Alpha & Delta variant transmission | medRxiv
[148] Research and analysis overview: VEEP: Vaccine effectiveness table, 24 September 2021 - GOV.UK (www.gov.uk)
[149] Waning Immunity after the BNT162b2 Vaccine in Israel | NEJM
[150] Correlation of SARS-CoV-2-breakthrough infections to time-from-vaccine | Nature Communications

months for people that received a second dose of the Pfizer/BioNTech vaccine, making people who received two doses of Oxford-AstraZeneca more at risk of a breakthrough infection compared to those doubly vaccinated with Pfizer/BioNTech (OR: 1.43, 95% Cis: 1.18-1.73, p<0.001)[151].

The latest Covid-19 vaccine surveillance report (week 45) published by the UK Health Security Agency (UKHSA) states that *"There is some evidence of waning of protection against infection and symptomatic disease over time, though protection against severe disease remains high in most groups at least 5 months after the second dose"* see figures 11 and 12[152].

Figure 11: Vaccine effectiveness against Delta symptomatic disease among individuals aged over 16, with two doses of Oxford-AstraZeneca (AZ), Pfizer/BioNTech (PF) and Moderna (MD) over a period of 20 weeks in England.

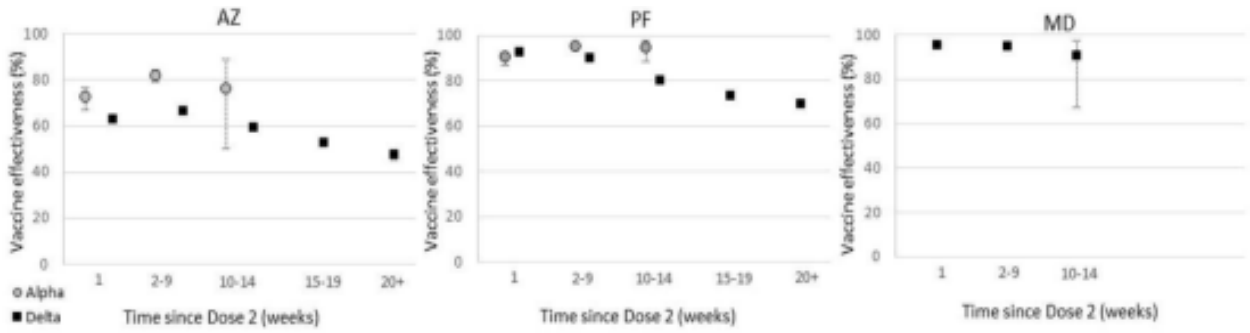
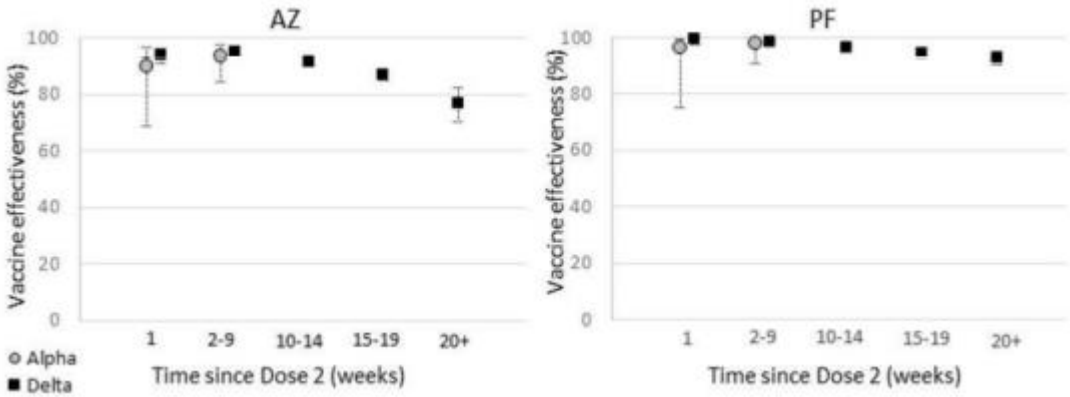


Figure 12: Vaccine effectiveness against Delta hospitalisation among individuals aged over 16, with two doses of Oxford-AstraZeneca (AZ) and Pfizer/BioNTech (PF) over a period of 20 weeks in England.



A study conducted on the resident population in Qatar looked at waning of Pfizer/BioNTech vaccine protection against infection (n= 907,763, people with two

[151] Waning of SARS-CoV-2 antibodies targeting the Spike protein in individuals post second dose of ChAdOx1 and BNT162b2 COVID-19 vaccines and risk of breakthrough infections: analysis of the Virus Watch community cohort | medRxiv
[152] COVID-19 vaccine weekly surveillance reports (weeks 39 to 45) - GOV.UK (www.gov.uk)

doses of vaccine). The study reported that the protective effect reached a peak in the first month after the second dose (77.5%), but then effectiveness started declining gradually and it accelerated after four months reaching approximately 20% between month 5-7 after the second dose. Effectiveness against severe, critical or fatal disease reached 96% or higher in the first two months after the second dose and it persisted at approximately this level for 6 months[153].

A pre-print paper detailing a UK real world data study demonstrated that vaccine effectiveness against symptomatic disease peaked in the early weeks after the second dose and then fell to 47.3 (95% CI 45 to 49.6) and 69.7 (95% CI 68.7 to 70.5) by 20+ weeks against the Delta variant for Oxford-AstraZeneca and Pfizer/BioNTech respectively. Waning of vaccine effectiveness was greater in older adults (65+ years old) compared to people 40-64 years old and amongst clinically extremely vulnerable groups. A smaller reduction in vaccine effectiveness against hospitalisation was reported, decreasing to 77.0 (70.3 to 82.3) and 92.7 (90.3 to 94.6) beyond 20 weeks post-vaccination for Oxford-AstraZeneca and Pfizer/BioNTech respectively. Vaccine effectiveness against death was 78.7 (95% CI 52.7 to 90.4) for Oxford-AstraZeneca and 90.4 (95% CI 85.1 to 93.8) for Pfizer/BioNTech[154].

Given the evidence around vaccine waning it points to the need for boosters to ensure that certification remains effective as a mitigation for transmission. The effectiveness of certification over the next 4-6 weeks and across the festive season on transmission therefore depends on boosters being rolled out quickly enough especially for those who received AZ

7.5 The impact of boosters

If boosters are rolled out and take up is high, certification will retain its effectiveness against transmission until there is more waning.

Results from the first UK real-world study (n=271,747 people) showed significantly increased protection against symptomatic disease from a booster dose of the Pfizer-BioNTech vaccine in those aged 50 years and older. The absolute VE from 14 days after the booster, using the unvaccinated baseline, was 93.1% in those with Oxford-AstraZeneca as their primary course and 94.0% in those with Pfizer/BioNTech as their primary course[155].

A large observational study conducted using nationwide mass vaccination data in Israel (n= 728 321 individuals), estimated that a third dose of the Pfizer/BioNTech mRNA COVID-19 vaccine is effective in preventing severe COVID-19-related outcomes. Compared with two doses of the vaccine administered at least 5 months before, adding a third dose was estimated to be 93% effective in preventing COVID-19 related admission to hospital, 92% in preventing severe disease, and 81% effective in preventing COVID-19-related death, as of 7 or more days after the third

[153] Waning of BNT162b2 Vaccine Protection against SARS-CoV-2 Infection in Qatar | NEJM
[154] Vaccine effectiveness and duration of protection of Comirnaty, Vaxzevria and Spikevax against mild and severe COVID-19 in the UK | medRxiv
[155] Effectiveness of BNT162b2 (Comirnaty, Pfizer-BioNTech) COVID-19 booster vaccine against COVID-19 related symptoms in England: test negative case-control study (khub.net)

dose[156]. This was an observational study with several limitations, however these early findings suggest that a third dose of mRNA vaccine is effective in reducing severe COVID-19-related outcomes for patients who have received two doses at least 5 months before.

Results from the Phase 3 booster dose efficiency trial announced in October by Pfizer/BioNTech (n=10,000 participants 16 years of age and over) showed that a booster dose restored vaccine protection against COVID-19 to the high levels achieved post-second dose with relative vaccine efficacy of 95.6% compared to those who did not receive a booster. The trial was carried out during a period when Delta was the prevalent variant[157].

The effectiveness of certification will change through time based on waving and timeliness of boosters, suggesting that a time limited certificate dependent on a recent second dose vaccine or booster may be useful to ensure the effectiveness of the vaccine remains high.

This is an approach already being introduced elsewhere, for example in Israel and France.

8. Public attitudes and societal impacts of vaccination.

A key objective of the certification scheme is to encourage vaccine take-up. For some vaccine hesitant people vaccine passports are perceived to be a reason why they would get vaccinated in the future. However, for others, vaccine passports were seen as coercive measures to control the population and violate privacy[158] [159].

A UK based online study, conducted in August[160] highlights that the interaction between individual characteristics, domestic settings, and types of immunity certificate design can affect willingness to use certificates. For example, participants' responses showed high willingness to use immunity certificates when visiting their GP for a non-urgent health matter (in a hypothetical scenario) compared to the other settings (dinning in a restaurant and going to the theatre). Research on the impact of COVID vaccine certificates is evolving[161] and more evidence will become available.

Research into public attitudes carried out by YouGov for the Scottish Government, on 5/6 October 2021, found that 74% of respondents agree[162] that the certification

[156] Effectiveness of a third dose of the BNT162b2 mRNA COVID-19 vaccine for preventing severe outcomes in Israel: an observational study - The Lancet
[157] Pfizer and BioNTech Announce Phase 3 Trial Data Showing High Efficacy of a Booster Dose of Their COVID-19 Vaccine | Pfizer
[158] Public attitudes to COVID-19 vaccines: A qualitative study | medRxiv
[159] Covid-19 vaccine passports and vaccine hesitancy: freedom or control? - The BMJ
[160] Why "one size fits all" is not enough when designing COVID-19 immunity certificates for domestic use: a UK wide cross-sectional online survey | medRxiv
[161] COVID-19 immunity (or vaccine) passports: a documentary overview and analysis of regimes of health verification within the coronavirus pandemic | Emerald Insight

[162] Respondents were asked the following 'Still thinking about the vaccine certification scheme that started in Scotland…. Which of the following, if any, do you think are

scheme has advantages, in particular encouraging people to get vaccinated (52% agree), making venues and events safer places to visit (49% agree), and in helping to prevent businesses having to close (44% agree). The most commonly selected disadvantage of the scheme (62% agree) is that people who are vaccinated can still be carrying the virus, followed by it will be difficult for venues and events to check (47%).

Further polling carried out by YouGov for the Scottish Government on 2-4 November[163] (See **Annex C** for further details on methodology and sample) found that awareness of the vaccine certification scheme in Scotland and Covid Status app are high, with a steady level of support for the scheme and majority recognition of the beneficial nature of the scheme for businesses.

Awareness of the vaccine certification scheme in Scotland is near universal at 93%, compared with 89% in early October and 84% towards the end of September. Awareness of the Covid status app is also high, at 80%, with one in three (36%) having downloaded it already – at 58% among those who have been to an eligible venue/event in the past week (although small base (n= 85) must be noted.

Overall support for the scheme is 59%, with around a quarter (24%) opposing it and 13% neither supporting nor opposing (similar levels to when asked towards the end of October).

Among the one in ten (n=85) who had been to an eligible venue or event in the past week, just over half (54%) showed their certificate, whether asked to or not (up from 36% two weeks before). A third (34%) – weren't asked to show their certificate and didn't show it, compared with 50% two weeks before. Enforcement was introduced in the middle of this two week period which is likely to have had some impact.

Three in five (60%) recognise that the scheme is designed to help rather than hinder eligible businesses/events. Nevertheless, the proportion who would like to see the scheme rolled out to other types of events and venues remains lower at 45%, and one in three (33%) agree that it will encourage more people to go to these venues/events, down from 38% four weeks before. Disagreement with these statements is at 29% and 28% respectively, with the remainder neither agreeing nor disagreeing.

COVID-19 has had a disproportionate impact on the health of people living with a range of conditions: 93% of people who died from COVID-19 up until April 2021 had at least one pre-existing condition. Understanding attitudes and beliefs regarding vaccination among those who are at increased risk is important. Interviews[164] were

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ADVANTAGES/DISADVANTAGES of having this Covid vaccine certification scheme place in Scotland? They were then given a list and asked to select all that they thought applied.

[163] Opinion polling is carried out by YouGov for the Scottish Government: conducted fortnightly with a sample of c.1000 adults 18+ across Scotland – demographically and geographically representative of the online population; fieldwork conducted mainly Tuesday/Wednesday on the dates shown with a small number of interviews on the Thursday morning

[164] Coronavirus (COVID-19): Highest Risk – interviews report – August 2021 (www.gov.scot)

conducted with people on the Scottish Government's highest risk list[165] who receive advice and support about being at highest risk from COVID-19. Findings indicated that some participants do feel more confident in managing risk after vaccination and have started to 'get back to normal'. However, many participants were still concerned about the behaviour of others (as also highlighted in survey research in July 2021[166]) and this was cited as something which prevented them from being able to feel confident to engage with others and access a range of venues and settings. Many were choosing to avoid places where they believed that risk to be highest, especially bars and restaurants.

If the policy objectives of certification to reduce the risk of transmission and to increase vaccine uptake are achieved, this could positively affect those who are at a higher risk of poorer health outcomes if they contract the virus. However more research should be undertaken. The addition of testing as well as vaccination may provide more higher confidence that there is lower risk of transmission from vaccinated individuals who may currently be infected.

As an alternative to or along with vaccination LFTs can also be used as the basis of certification. Further opinion polling carried out by YouGov for the Scottish Government, on 5-6 October, indicated that almost nine in ten are aware that everyone can now access testing. 41% have ordered or collected self-administered LFD tests, an increase since late August (35%). Of those who have ordered or collected tests[167], nine in ten have used them.

To fully assess the societal and equality aspects of any changes to the existing vaccination certification scheme a further Equality Impact Assessment (EQIA) will be produced in due course which will contain detailed evidence of the impact on different diversity groups. This will also assesses the impact of the policy on the Scottish Government's obligations under the Public Sector Equality Duty (PSED) to advance equality of opportunity, eliminate unlawful discrimination and to foster good community relations. An updated Children's Rights and Wellbeing Impact Assessment (CRWIA) to analyse the potential impact, both positive and negative, of the domestic use of Covid Status Certification on the promotion of children's rights and wellbeing will also be produced.

9. The Potential Economic Implications of Amending or Expanding Certification

9.1 Background

Analysis of the potential economic impacts of the introduction of certification were set out in the Evidence Paper and Business and Regulatory Impact Assessment (BRIA) published in September 2021[168]. These considered the potential implications of the

[165] The 'highest risk list' was previously known as the 'shielding list' and contains around 180,000 people, the majority of whom were previously asked to shield by the Chief Medical Officer (CMO).
[166] COVID-19: Highest Risk – Survey report - July 2021 (www.gov.scot)
[167] Base –All who have accessed universal testing (n=641)

[168] Coronavirus (COVID-19) vaccine certification: evidence paper - gov.scot (www.gov.scot); The Health Protection (Coronavirus) (Requirements) (Scotland) Amendment (No. 2) Regulations 2021 (legislation.gov.uk)

introduction of certification, set against the alternative of not introducing a certification scheme.

While the latter option was not thought likely to have any immediate financial implications for businesses, if the state of the epidemic required further more restrictive measures such as closures to be considered, the negative economic impact on these sectors was thought likely to be significant. The introduction of certification would allow specific high-risk settings, which had either been closed for long periods of time throughout the last 18 months or operating at reduced capacity, to remain open and to provide a safe experience for customers and to allow businesses to continue to operate.

This section builds on the analysis presented in the previous Evidence Paper on certification and the BRIA, to explore the potential business and economic implications that could arise were certification to be amended or expanded further, following on from the First Minister's Covid-19 update to Parliament of 16 November 2021. It also summarises emerging views of business stakeholder representatives, communicated since the implementation of certification began in October 2021.

9.2 Businesses and sectors affected

In the Covid-19 update to the Scottish Parliament[169], the First Minister said the following with regard to vaccine certification:

"When the scheme launched, on 1 October, we judged that it was not appropriate at that time—given the imperative to drive up vaccination rates—to include testing as an alternative to proof of vaccination. However, we indicated that that would be kept under review. We will therefore be assessing, in the coming days, whether, on the basis of current and projected vaccination uptake rates, we are now in a position to amend the scheme so that, in addition to showing evidence of vaccination to access a venue, there will also be the option of providing evidence of a recent negative test result. That is already a feature of many other countries' certification schemes.

We are also considering whether an expansion of the scheme to cover more settings would be justified and prudent, given the current state of the pandemic. Again, let me stress that we have not at this stage taken a decision to extend the reach of the scheme. However, to allow us to engage openly with businesses in the coming days about the pros, cons and practicalities, I confirm that the kinds of setting that might be in scope are indoor cinemas, theatres and some other licensed and hospitality premises.

We would, of course, retain exemptions for people under 18, people who cannot be vaccinated or tested for medical reasons, people on clinical trials, and people who work at events or in venues that are subject to the scheme. Exceptions would also be retained for worship, weddings, funerals and related gatherings."

The First Minister indicated that consideration would be given to amending the existing scheme to incorporate proof of a negative Covid test, and to expansion of

[169] Meeting of the Parliament: 16/11/2021 | Scottish Parliament Website

certification to additional settings. Amending the existing scheme would potentially affect those sectors and activities currently within scope of the certification system, including:

- Nightclubs and late night venues;
- Indoor cultural performance venues associated with live events, particularly larger venues that stage unseated performances;
- Outdoor venues associated with large cultural or sporting gatherings, such as larger sports stadia and racecourses;
- Conference centres, in instances where staging large scale seated or unseated live events, trade fairs, markets or exhibitions;
- Businesses involved in the organization and staging of live events, such as performers, event promoters, staging and production businesses, associated supply chain businesses;
- Ancillary businesses dependent on live events (e.g. food and drink sales, merchandising).

Expanding the coverage of the certification scheme would bring in additional settings within scope of certification. No formal announcement has been made of the scope of any expansion. Following on from the First Minister's statement, this analysis considers the potential implications were expansion of certification to include the following settings:

- Indoor cinemas
- Theatres
- Concert Halls
- Hospitality venues, including cafes, restaurants, pubs, bars, hotel bars and restaurants, and social clubs
- Cafes and restaurants in other settings, such as supermarkets, larger retail units, and other leisure settings.

9.3 Feedback from Business Stakeholders

In the period since introduction, business stakeholder responses have varied across different sectors of the economy that have been covered by certification requirements. The picture on impacts on business is still emerging, partly as a result of the policy having been introduced less than two months ago, and with legal enforcement only beginning on 18th October 2021.

This section provides an overview of stakeholders' initial experiences of implementation and impacts from certification in the time since it entered operation.

Nightclubs and Late Night Settings

Nightclubs and Late Night Settings have been required to operate a 100% checking rate should they fall within scope of the regulations. Trade bodies have provided feedback to Scottish Government on both implementation issues and emerging business impacts, both through direct engagement with Scottish Government

officials and via rapid membership surveys. In general, they have reported have reported implementation challenges and substantial turnover losses among members affected by certification.

Since introduction, trade bodies representing Nightclubs and Late Night Settings have consistently provided reports of negative impacts on footfall and revenues in affected business segments. Trade bodies have consistently provided reports of members experiencing reduced footfall and takings, with one trade body indicating that members were experiencing footfall reductions of 20%-40%, and falls in revenue of up to 45%-50% (in the case of some traditional night clubs)[170]. There have also been incidences reported of individual premises changing their offerings and business models (such as through reducing opening hours or converting their premises) to avoid falling within the requirements of certification[171].

Trade bodies have reported several sources of implementation challenges. These have included reports of varying degrees of awareness among customers of 'hybrid' venues of whether they require certification, reports of technical issues associated with the certification app, and reports of staff members being subject to increased anti-social behaviour associated with certification requirements. Trade bodies have reported that availability of door staff has been an ongoing issue, with requirements to employ SIA-accredited staff being a requirement of licenses.

Trade bodies' surveys of members have also provided reports of some members experiencing loss of staff or management time associated with implementing certification and increased overheads[172].

Looking forward, trade bodies have begun to highlight concerns regarding potential cancellations of Christmas bookings for individual businesses as a result of certification, and of the potential impact of footfall losses from certification on the financial viability of affected businesses, particularly in conjunction with rising costs and repayment of Covid-related debt.

Large Events

Feedback from member organisations to Scottish Government officials has indicated that those affected may have experienced additional costs associated with implementation. There have also been anecdotal reports of reductions in ticket sales in some instances, and reduced capacities at some commercial events arising from certification.

Event sector stakeholders have highlighted that public awareness of certification among some attendee segments remains low, including older and international visitors. While there has been recognition that certification extends to nightclubs, stakeholders have reported some audience confusion around the range and extent

[170] Source: direct engagement between hospitality stakeholder representative groups and Scottish Government officials, October – November 2021.
[171] Edinburgh nightclub scraps Covid vaccine passports amid huge decline in footfall - Edinburgh Live
[172] Source; FSB reveals small business vaccine passport polling | FSB, The Federation of Small Businesses; subsequent direct engagement between Scottish Government officials and FSB Scotland.

of event settings that fall within certification requirements. Stakeholders have also advised of potential eligibility challenges from non-MHRA vaccines not being accepted, in the context of business events, and the potential additional costs that may be borne by community or not-for-profit events that fall within scope.

Event sector stakeholders have advised that requirements to check vaccination status have been added to existing checking arrangements around tickets, age verification and bags. This has led to anecdotal reports of increased wait times at events, queues and crowding at event venues. Event sector stakeholders have also provided anecdotal feedback of increased aggression towards security staff and stewards in some contexts.

Events sector stakeholders have also provided anecdotal evidence of business impacts. Individual events organisers have advised of larger drop-offs in actual attendance compared with ticket sales than would typically be expected. Individual events have also provided anecdotal evidence of small numbers of individuals being refused entry to specific events as a result of certification, and of refunds being requested, but with these potentially having varied by event type. There have also been examples where certification has been mentioned as a factor in organisation of specific events: certification is in operation in Edinburgh's Hogmanay, which will be operating at reduced capacity[173]; while certification requirements, specifically the additional queueing time, were cited as one of the reasons for Glasgow cancelling the George Square Lights 'switch on' and Christmas market[174].

Sporting Events

Certification requirements have also impacted on a small number of sporting events in Scotland. So far, five football clubs have been affected, along with football and rugby internationals.

Feedback from affected stakeholders has indicated that there has been generally good compliance with certification requirements among those attending matches. Check rates are reported as having been generally increasing, and there have been no reports of certification directly impacting on attendance as yet. However, initial issues with the app led to a focus on visual checks. This has been maintained but app usage is growing slowly. Stakeholder feedback also indicates that there is potential for inclement weather to impact on "scanability" of QR codes, and on paper copies.

Stakeholders have reported that additional stewarding has been necessary to implement certification as currently designed. Public safety and order remains critical and would override certification checks if necessary.

9.4 The Number of Businesses Potentially Affected by Amendment or Expansion of Certification

[173] Edinburgh revives Hogmanay street party, gardens concert and midnight fireworks | The Scotsman
[174] Glasgow's Christmas lights switch on cancelled in favour of virtual event - Glasgow Live

Estimated numbers of businesses and premises potentially affected by the certification requirements introduced on 1st October were estimated in the previous BRIA and Evidence Paper. This section reproduces that analysis, as these businesses may lie within scope or be impacted by amendments to existing certification arrangements. It also provides estimates of business numbers associated with the settings set out above, to help illustrate the potential implications of amendment or expansion of certification to additional settings.

Events industry

Direct and indirect impacts on the Events Industry arising from certification would accrue to venue operators, but also potentially on event organisers, performers, support businesses and ancillary businesses, operating across a range of event types, depending on audience numbers. It is not currently possible to indicate the full range of individual events that would be impacted by the regulations, or the associated number of wider businesses affected. The following data therefore presents a summary of data on businesses associated with staging and supporting of events in Scotland overall.

It is estimated, based on the Inter-Departmental Business Register 2021 and 2020 Business Register and Employment Survey, that there are 3,725 Events Industry businesses in Scotland. Event catering businesses, performing arts, activities of sports clubs and activities of exhibition and fair organisers are such businesses in Scotland that fall under this classification.[175] These businesses operate across 4,560 sites (as some businesses may have more than one site) and are estimated to employ around 42,250 people (2% of Scotland's jobs in 2020). [176]. Not all of these businesses would be in scope, however, we currently have no specific data on supply chains for these businesses. It is likely that most of these are based in cities and larger towns although it is not possible to obtain detailed data at this time.

The Business Register and Employment Survey 2020 indicates that, overall, more than half (54%) of employees in the sector work part-time.

Approximately 6,300 (11.1%) of workers in the events industry were self-employed. This is a slightly lower proportion than for the workforce as a whole (12.4%). The proportion of women working in the events industry is similar to the proportion in the overall workforce – 46.6% and 48.8% respectively. However, for Events Catering

[175] Events Industry defined here using the following SIC2007 codes:
5621 : Event catering activities
9001 : Performing arts
9002 : Support activities to performing arts
9004 : Operation of arts facilities
9311 : Operation of sports facilities
9312 : Activities of sport clubs
68202 : Letting and operating of conference and exhibition centres
74209 : Other photographic activities (not including portrait and other specialist photography and film processing)
79909 : Other reservation service activities (not including activities of tourist guides)
82301 : Activities of exhibition and fair organizers
82302 : Activities of conference organizers
93199 : Other sports activities (not including activities of racehorse owners)
[176] Source: Business Register and Employment Survey, 2020

Activities, women make up 55.4% of the workforce and for Other Reservation Service and Related Activities they make up 72.9% of the workforce[177].

Sports

For the sports sector, certification continues to potentially impact on Scottish Rugby home internationals, Scottish Football home internationals, and the home fixtures for all of Rangers, Celtic, Aberdeen, Hearts and Hibernian. The two Dundee clubs may occasionally be affected too. However, for domestic games one of the Glasgow and Edinburgh clubs will have a home fixture each week and there will be additional domestic and European cup matches where certification is required.

Late night venues with music, alcohol and dancing – Nightclubs and Hybrid Venues

It is estimated, based on the Inter-Departmental Business Register 2021 and 2020 Business Register and Employment Survey, that there are 130 businesses under the heading non-charity licensed clubs. Nightclubs and sexual entertainment[178] businesses in Scotland fall under this classification. These businesses operate across 150 sites (as some businesses may have more than one site). In 2020, these were estimated to employ around 1,500 people. It is not possible to separate out sexual entertainment venues from this, though it is understood less than 20 operate in Scotland as of 2015. The vast majority of nightclub and sexual entertainment businesses are small (employing less than 50 people). We currently have no specific data on supply chains for these businesses. It is likely that most of these are based in cities and larger towns although it is not possible to obtain detailed data at this time.

- Based on the Annual Business Survey 2018, nightclub businesses had an estimated turnover of £84 million in 2018 (0.03% of Scotland's non-financial business economy turnover in 2018).
- Based on the Annual Business Survey 2018, nightclub businesses had an estimated Gross Value Added[179] of £44.6 million in 2018 (0.05% of Scotland's non-financial business economy GVA in 2018).
- Based on the Inter-Departmental Business Register 2021, it is estimated that there are 130 nightclub Businesses in Scotland. These businesses operate across 150 Sites (as some businesses may have more than one site).

There are potentially premises that might be classed as pubs or restaurants in official statistics that could fall within scope of existing certification requirements.

[177] Source: Annual Population Survey, Jan-Dec 2019, ONS.
[178] As per previous work for Nightclub related BRIAs (e.g. p54-71: The Health Protection (Coronavirus) (Restrictions and Requirements) (Local Levels) (Scotland) Regulations 2020 (legislation.gov.uk) –Nightclub businesses are defined here as non-charity licensed clubs (within Standard Industrial Classification code 56.301). Nightclubs and sexual entertainment businesses in Scotland fall under this classification. The SIC code definition of nightclubs used here does not align perfectly with the definition of nightclubs used in certification regulations. These statistics therefore represent a best estimate.
[179] Gross value added (GVA) represents the amount that individual businesses, industries or sectors contribute to the economy. It is the value of an industry's outputs less the value of intermediate inputs used in the production process.

Stakeholder estimates suggested that there may be around 300-400 premises across Scotland that operate as 'hybrid' venues (e.g. as pubs or restaurants during the day, and late night venues with music, alcohol and dancing at night)[180].

Entertainment Venues – Cinemas, Theatres, Concert Halls

The cinema sector forms part of Scotland Leisure and Entertainment industry and includes a range of providers, including multiplex sites and independent operators. There were 71 fixed sites screening first-run film in Scotland in 2020, run by 38 organisations (31 multiplex sites and 4 independent chain sites run by 8 operators and 36 independent venues run by 30 operators).

It was previously estimated that there were 1,530 employees working in film exhibition in Scotland (based on Office for National Statistics and BFI methodology) however this figure is likely to be an underestimate as it removes multi-arts venues and misses organisations that aren't registered under the specific tax code for cinemas[181].

Based on the data we have available, which is dependent on how businesses are registered, there are 590 registered businesses in the performing arts, support activities for performing arts and operation of arts facilities (IDBR 2019). Around 570 of these are classified as small businesses with 49 employees or less. These 590 businesses employ 4,400 people. Additionally, there is also a very high proportion of freelancers/self-employed working in the sector.

Hospitality Venues

The hospitality sector has a significant footprint within Scotland. The sector is a significant employer: in 2020, the sector employed around 137,000 people. This is comprised of: 41,000 employed in Hotels & Similar Accommodation; 36,000 in licensed restaurants; 29,000 in unlicensed restaurants & cafes; 4,500 in licensed clubs (which includes nightclubs, social clubs etc); and, 26,000 in public houses & bars[182].

There are also a substantial number of business premises within the hospitality sector across Scotland. Scottish Government analysis based on the Assessor's Non-Domestic Rates Valuation Roll and the IDBR[183] suggests there are approximately 13,600 business premises that could be classed as hospitality premises. These include over 3,200 public houses, almost 3,000 restaurants,

[180] Source: Night Time Industries Association (2021), Covid Status Certification: NTIA Scotland Briefing Paper. The NTIA also suggested there may potentially be up to 1,500 premises that may operate with some of the late night venues with music, alcohol and dancing characteristics (e.g. late opening, dancefloors, loud music). However, it was not currently clear the extent to which all or some of these premises would fall within scope of the regulations.
[181] The Health Protection (Coronavirus) (Restrictions and Requirements) (Local Levels) (Scotland) Regulations 2020 (legislation.gov.uk), pages 40-53.
[182] Source: BRES, 2020. These include the estimated numbers of employees mentioned in the section describing nightclubs and late night settings.
[183] Scottish Government analysis. NDR estimates are based on data as at October 2021 and exclude premises flagged as vacant or in receipt of Empty Property Relief. Inter-Departmental Business Register (March 2021) estimates for cafes are based on SIC Sub-class 56.10/2.

approximately 2,700 cafes, over 2,200 hotels, and over 2,400 other licensed premises (such as social clubs and bowling clubs), in addition to premises classed as nightclubs.

However, it is also recognised that there are a range of hospitality settings that could be affected by certification, but which may not be contained within these estimates. These could include:

- Cafes situated within supermarkets, department stores, garden centres, bookstores, and larger retail units;
- Sit-in hospitality venues within transport hubs (e.g. airports, train stations, bus stations)
- Cafes situated within visitor attractions, museums and galleries;
- Cafes in sports facilities (e.g. leisure centres);
- Hybrid venues (particularly though not exclusively in rural Scotland) – such as post offices, village shops, community libraries, community arts centres.

It is currently challenging to provide precise estimates of business premises that include these facilities. Initial Scottish Government analysis based on data held by Food Standards Scotland[184] suggests that there are of the order of 4,400 Pubs & Clubs recorded as food businesses at Scotland level; and over 10,700 premises recorded as restaurants, cafes or canteens, in addition to businesses identified as hotels and guest houses.

9.5 Potential Nature of Economic Implications

9.5.1 Context

The sectors that would be affected by certification are also those that have been hard hit by the impact of the pandemic as a result of restrictions that have required long periods of closures and limits on their operating capacity. Hospitality venues operated under significant restrictions on trade, and sustained periods of closure, between March 2020 and August 2021, as have venues like theatres, cinemas, concert halls, live performance venues and sports arenas.

Over the course of the pandemic, businesses in Accommodation & Food Services sector and Arts, Entertainment & Recreation sector have consistently been more likely to report decreased turnover than businesses across all sectors – 46.8% and 61.0% respectively, compared to 27.6% of businesses across all sectors in the period 4-17 October 2021[185].

During this period, 9.1% of businesses in the Accommodation & Food sector, and 14.7% of businesses in the Arts, Entertainment & Recreation sectors reported their turnover had decreased by more than 50% compared to what would normally be expected, compared to 4.2% of businesses across all sectors.

[184] Scottish Government analysis, based on data from Food Standards Scotland's Scottish National Database.
[185] BICS weighted Scotland estimates: data to wave 42 - gov.scot (www.gov.scot)

Hospitality continues to experience difficult trading conditions; for instance, BICS data indicates that:

- Between 18-31 October 2021, 80% Food & Beverage Service businesses were 'fully' trading; 16% were 'partially' trading; and 4% had paused trading, but intended to resume within 2 weeks;
- Between 4-17 October 2021, 44% Food & Beverage Service businesses saw turnover below normal expectations for the time of year, a similar proportion to those seen since July. Within this, 28% reported turnover more than 20% below normal expectations;
- Between 4-17 October 2021, 31% expected turnover to decrease in the next 2 weeks.

Despite rapid growth in recent months, GDP in the Accommodation & Food Services sector as at August 2021 was still 11.2% below the position in February 2020. GDP in the Arts, Culture & Leisure sector was also 16.8% below its pre-pandemic position[186].

The sustained losses incurred by many businesses in worst affected sectors will likely have a significant impact on resilience. It follows that borrowing will have increased, and cash reserves will have been depleted for many businesses. Even as profitability approaches pre-COVID-19 levels in the worst affected sectors, businesses in these sectors could be vulnerable to any further COVID-19 measures and restrictions, particularly as key support packages such as furlough scheme are withdrawn.

Some of the sectors potentially affected by certification are also seasonal businesses, with a substantial portion of annual turnover being generated in December. Pre-pandemic, the Food Services sector, which includes cafes and restaurants, was estimated to generate around 9.1% of its overall annual average turnover in December, compared with around 7.3% and 7.4% in January and February. The Beverage Services sector, which includes bars and pubs, was estimated to generate around 9.8% of its overall annual average turnover in December, compared with 7.2% and 7.1% in January and February[187]. These estimates are for these sectors overall – individual businesses may generate a more substantial portion of their annual turnover in the lead-up to Christmas.

9.5.2 Potential Impact Cost Implications for Affected Businesses

The previous Evidence Paper and BRIA described a range of potential cost impacts on businesses associated with implementation and delivery of certification. These costs are described again below. These may already have been incurred by businesses covered by certification to date. However, for businesses affected by an extension or expansion of the certification scheme, these costs would likely be additional, and would accrue to a potentially large number of businesses and premises.

[186] GDP Monthly Estimate: August 2021 - gov.scot (www.gov.scot)
[187] Scottish Government analysis of Monthly Business Survey

An extension or expansion of certification to a wider range of settings would potentially result in implementation costs for businesses and administration challenges at a time when businesses in the sectors have weak cash flow. Consequently, individual businesses may experience a deterioration in their operating conditions, diminishing their resilience to cope with further impacts.

Examples of costs that could arise may include:

- Additional resource for recruiting or training staff to check certification.
- Dedicated hardware to scan or read certification (mobiles/tablets) and/or install technology to check QR codes at automatic entry barriers.
- Cancellation of tickets and refunds
- Additional policing costs arising if there are scenes of disorder at sports stadia due to long queues caused by certification checks.
- For business events, additional complexity of exempting one element of the programme (e.g. standing receptions), with associated cost and reputational risk of denying delegates who are attending this and all other elements in a work capacity. Business event professionals have shared that the majority of high value business events in Scotland encompass receptions that would be in scope (500+).
- Loss in revenue if customers choose to visit venues and events which do not require certification (see next section of impact on footfall and revenue).

The extent of these costs would likely vary across businesses, depending on the scope to integrate them into existing staff functions, use existing IT infrastructure, or physical infrastructure. These costs may be higher for businesses which have not delivered a similar function historically, such as venues which have previously not had a need for door staff and may now require staff to check certification at the point of entry.

Staff costs represent a large component of the overall running costs of businesses in these sectors. For example, in Accommodation and Food Services sector staff costs account for 42% of total costs and in Arts, Culture and Entertainment sector staff costs account for 18% of total costs (compared to 25% across all sectors)[188].

Overall impacts on staff costs would likely vary across businesses depending on several factors, particularly whether the regulations' requirements could be accommodated within existing staff responsibilities or would require additional staff. If the latter were required, costs would be influenced by factors such as numbers of staff required, and number of hours required each week. It is not currently possible to give an estimate of the overall magnitude of additional staff costs for the reasons set out above. However, hourly and weekly gross wage costs for occupational groups that would be affected by the regulations are set out the Table 5 below. It should be noted that these statistics do not include non-wage labour costs, such as Employers' NIC and pension contributions:

Table 5: Gross Mean Hourly and Weekly Pay, Selected Occupations, 2019

[188] Scottish Annual Business Survey, Scottish Annual Business Statistics (SABS) 2018, Scottish Annual Business Statistics 2018 - gov.scot (www.gov.scot). Note that SABS excludes financial sector & parts of agriculture and the public sector.

	Mean Gross Hourly Pay, £			Mean Gross Weekly Pay, £		
	All	Part-Time	Full-Time	All	Part-Time	Full-Time
Security Guards & Related Occupations (SOC 9231)	£11.09	£12.50	£10.91	£409.30	£216.20	£467.60
Bar Staff (SOC 9265)	£8.37	£8.38	£8.36	£151.90	£123.30	£303.40

Source: ONS, Annual Survey of Hours and Earnings 2019, Tables 15.1a, 15.5a: Earnings and hours worked, region by occupation by four-digit SOC: ASHE Table 15 - Office for National Statistics (ons.gov.uk)

It is noted that there is a widely reported difficulty in securing sufficient numbers of stewarding and hospitality staff at present, due to labour shortages. For instance, in the period 18-31 October 2021, 61.2% of businesses in the Accommodation and Food Services Sector reported that vacancies were more difficult to fill compared to normal expectations for the time of year, and 52.7% reported having a worker shortage[189]. Hospitality stakeholder organisations have highlighted challenges in the availability of SIA-accredited door staff[190]. There is also evidence of continued strong growth in vacancies in areas like hospitality[191]. These could create challenges for affected businesses across affected sectors in recruitment of numbers of staff required as a result of regulations. Stakeholder organisations have also provided anecdotal feedback of increased anti-social behaviour directed towards staff in some settings as a result of certification, which could create additional challenges for staff recruitment, retention and wellbeing.

The magnitude of these costs will be closely linked to the level of enforcement expected from businesses, the type and footprint of venues, and flow of customers at venues and events. Current certification arrangements have varied across settings: for instance, late night venues have been required to operate a 100% check on entry, given the option for a visual check. For large events, spot check arrangements have been in place.

Prior to the introduction of certification, it had been indicated by businesses that a 20% visual check at sporting events may be achieved with minimal additional resource, however the Scottish Football's COVID-19 Joint Response Group estimates that the cost of creating and staffing an outer cordon in sports stadia could cost upwards to £5,000 per game, and that is before technological infrastructure costs.

[189] Source: BICS weighted Scotland estimates: data to wave 42 - gov.scot (www.gov.scot)
[190] Source: direct engagement between hospitality stakeholder organisations and Scottish Government officials, October – November 2021.
[191] For instance, the RBS Markit Report on Jobs, October 2021 reported continued strong growth in August in temporary and permanent Hotel & Catering staff vacancies in Scotland, albeit after unprecedented declines in Spring 2020. Royal Bank of Scotland Report on Jobs - October (natwestgroup.com)

The technology investment may be a one-off expenditure for businesses, with requirements to issue staff with dedicated hardware to read certification such as mobile phones or tablets.

There may be additional costs associated with enforcement and subsequent policing due to Certification. Given the limited scope of the certification scheme we would anticipate these being absorbed as part of the work of EHOs and Police Scotland relating to enforcement and adherence at larger events

Businesses involved in the organisation and staging of live events and ancillary businesses dependent on live events (e.g. food and drink sales, merchandising) may experience knock on effects from the impacts experienced by venues and events The impact on business profitability has been raised consistently with many sectors highlighting that their members are already running with high levels of debt due to closures during the pandemic and therefore a reduction in customers or an interruption to normal trading will put some business premises in a more difficult financial position.

9.5.3 Potential Implications for Footfall and Revenue

Expansion of certification may also impact on footfall, which in turn could result in a loss of trade and revenue for participating venues, with consequent pressures on individual businesses' viability.

The previous Evidence Paper and BRIA described the potential for impacts on footfall and revenues for businesses affected by certification. It is challenging to directly identify the impact of certification on losses of footfall and turnover experienced by individual businesses, owing to the relatively short space of time that certification has been in place, and potential impacts from other contributory factors. However, emerging reports from stakeholder organisations in the hospitality sector suggest that nightclubs and late night settings affected by certification have experienced substantial reductions in footfall and revenues since introduction of certification[192].

However, for businesses affected by an extension or expansion of the certification scheme, footfall impacts would potentially be additional, and could be felt by a potentially large number of businesses and premises.

Footfall in the settings that currently fall within certification requirements, or could fall within them, is potentially substantial. YouGov polling for 2-4 November[193] suggests 44% of those polled had visited some form of hospitality venue – any cafes, restaurants, pubs or bars - in the previous week.

[192] https://www.ukhospitality.org.uk/news/587027/; FSB reveals small business vaccine passport polling | FSB, The Federation of Small Businesses; direct engagement between Scottish Government officials and hospitality stakeholder organisations, October – November 2021..

[193] Opinion polling is carried out by YouGov for the Scottish Government: conducted fortnightly with a sample of c.1000 adults 18+ across Scotland – demographically and geographically representative of the online population; fieldwork conducted mainly Tuesday/Wednesday on the dates shown with a small number of interviews on the Thursday morning.

Polling evidence for 2-4 November also suggests that, in the previous week:

- 33% had sat inside a café or restaurant;
- 20% had sat inside a pub or bar;
- 9% had visited a DIY store or garden centre;
- 8% had visited a museum, gallery, library, cinema, or theatre;
- 5% had been in a nightclub or late night venue;
- 10% had been to any sort of venue/event eligible for certification (a nightclub or late night venue or large event)..

Generally levels for each of these are higher among 18-29 year olds than other ages (with the exception of garden centres/DIY stores). Pre-pandemic, there was also evidence to suggest that larger portions of 16 to 24 year olds, 25 to 34 year olds, and 35 to 44 year olds had visited cinemas and attended live music events in the previous year than the share of the population overall. However, a lower share of 16 to 24 year olds and 25 to 34 year olds had visited the theatre than the population overall[194].

Footfall could be impacted in the following ways:

- Those without certification would be refused entry (which in turn depends on numbers vaccinated)
- Others may be reluctant to attend if non-certificated friends were unable to attend
- Entry delays could deter customers if onerous.

The extent of economic harm would arise from the numbers of unvaccinated people within the population overall, and those who are not fully vaccinated in the previous fortnight to expansion at the point at which certification requirements would come into effect. If people within this group were unable to enter settings, this would represent a loss to the potential customer base to affected businesses and sectors, and therefore a source of economic harm. The depth and duration of economic harm would depend on the speed with which people became eligible for certification, and the availability of alternatives to vaccine certification, such as a negative test result.

Under the current requirement for a minimum of 2 weeks between individuals receiving their second dose of vaccine and being eligible for certification, vaccine update data[195] suggests that:

- Around 88.1% of the overall population aged 18+ had received two doses of vaccine by 17 November, and would therefore be eligible to access certification by 1st December.
- Among younger age groups, this proportion fell to 69% of those aged 18- 29, and 77.6% of those aged 30-39, and 87.7% of those aged 40-49.

[194] Scottish household survey 2019: culture and heritage - report - gov.scot (www.gov.scot), Table 3.3.
[195] COVID-19 Daily Dashboard | Tableau Public. Data accessed 18 November, covering 17 November.

Should those currently unable to access certification be unable to access premises that require it, this could generate reductions in footfall and turnover for affected premises. In settings where tickets are purchased in advance, it may also generate requests for refunds, creating additional cashflow challenges for individual businesses.

It may be possible that, going forward, custom could increase if customers feel safer, particularly amongst higher spending older customers. Options that include proof of negative Covid test results (e.g. lateral flow tests) would offset economic harm to a degree because it would increase the number of potential customers able to access the venues (given that not all people eligible to have double vaccination have done so, for a variety of reasons). This would apply to business affected by potential expansion of the scheme, and those that already fall within existing requirements. Some businesses may also choose to offer lateral flow tests to customers on arrival, potentially increasing their costs.

9.5.4 Wider impact on consumer choice and markets

Certification will potentially restrict some consumers' ability to attend venues affected by certification, and potential displacement to less regulated settings, such as private house parties. This may place increased pressure on businesses involved in these activities through reduced footfall and turnover, with consequent pressures on business viability. This pressure may encourage business exit if sufficiently severe and long-lasting; however, it will also be influenced by consumers' decisions around vaccine uptake, and the duration and severity of the wider pandemic.

9.5.5 Impacts of closure

However, if the state of the epidemic requires further more restrictive measures such as closures to be considered, the negative economic impact on these sectors is likely to be significant.

COVID-19, and previous restrictions introduced to control the virus, have substantively affected the hospitality, events and cultural sectors. For instance, during the first lockdown output fell significantly over the month of April 2020: by 77.2% in Accommodation and Food Services and by 44.6% in Arts, Culture and Recreation sector. When further restrictions were imposed on Accommodation and Food Services in 2021 output fell 33.7% over the month of January 2021. These figures highlights the potential order of magnitude of loss in economic output that could arise from closure[196].

Relative impacts of the pandemic on sector viability have varied between sectors and business size bands, with sectors more seriously affected by restrictions for longer periods have endured longer periods of lack of viability (e.g. Accommodation & Food Services, Arts, and Entertainment & Recreation). Over the course of the pandemic, businesses in Accommodation & Food and Arts, Entertainment & Recreation sectors have consistently been more likely to report decreased turnover than businesses across all sectors.

[196] GDP Monthly Estimate: August 2021 - gov.scot (www.gov.scot)

The sustained losses incurred by many businesses in worst affected sectors will likely have a significant consequences for resilience. It follows that borrowing will have increased, and cash reserves will have been depleted for many businesses. Even as profitability approaches pre-COVID-19 levels in the worst affected sectors, businesses in these sectors could be vulnerable to any further restrictions, particularly as key support packages such as job retention scheme are withdrawn. Unlike the first and subsequent lockdowns, the support schemes in place in future will be different with, for example, the furlough scheme having ended in September 2021. This would exacerbate the economic impact of closure for businesses in these sectors.

10. Conclusion

The current vaccine certification scheme has been in operation for a number of weeks. Over that time it has likely contributed to a small rise in vaccinations amongst the younger age group. The public demonstrate a high awareness of the existing scheme and are generally supportive recognising the benefits it can bring while also expressing some concern around inequalities. Business organisations have reported negative economic consequences in terms of footfall and revenues along with staffing difficulties.

The impact of certification cannot be measured directly. However, as a measure to reduce the risk of an infectious person infecting others it is a far less restrictive measure than re-introducing capacity limits on venues, early closure times or complete closure of events. By itself it is not sufficient to control the virus but it contributes to a package that attempts to balance the harms.

Research evidence indicates including a wider range of settings may increase the usefulness of certification as a measure to reduce infection. Wider international evidence suggests that expanding the settings included in any certification scheme may encourage older individuals who are not yet vaccinated to take up the vaccine. While certification is unlikely to convince the most vaccine hesitant to be vaccinated, it may convince those who are currently indifferent.

Including a wider range of settings may also lead to a better understanding of the fact that the pandemic is still with us and continues to present a current threat. It will introduce some costs for a wide range of businesses. However, in a situation where cases are rising and hospitals are operating at capacity it allows higher risk settings to remain open as safely as possible, and to continue to trade. It may also provide a more sustainable basis for these businesses to continue to operate safely in the long run.

Vaccines are effective at reducing infection and therefore vaccine certification reduces the chances of an infected person being present in a particular setting. Time limited certifications would ensure that all individuals have a high level of vaccine protection while enabling them to enter higher risk settings. The introduction of the requirement for evidence of a negative Lateral Flow test as an alternative is not without risk as unvaccinated individuals will still be more vulnerable in a situation where others may be infectious and able to transmit. However, it addresses issues of

human rights and equalities and could reduce the risk of infection in venues at this stage in the pandemic.

Annex A - Methodology note

The data for this report were gathered through an elaborate and collaborative process including input from the SG Library services, colleagues from the Covid Ready Society Division and colleagues from the Reporting, Societal Impact and Wellbeing, and Evidence Team of the C-19 Analysis Division.

A search of the Knowledge Exchange database was conducted by the SG library team using search terms including, but not limited to: “coronavirus”; “covid-19”; certificate*; passport; documentation . The Knowledge Exchange database includes following databases:

- Idox – a UK information service for government and the public sector.
- KandE (Knowledge and Evidence) – single search across a range of quality databases selected by the librarians.
- Knowledge Network – the national knowledge management platform for health and social care in Scotland.
- Policy Commons – community platform for objective, fact-based research from the world’s leading policy experts, nonpartisan think tanks, IGO’s and NGOs.
- ProQuest – a collection of social science abstracts and index databases.
- OCLC First Search – search for articles books and conference papers across a range of databases including ArticleFirst and WorldCat
- British Library Catalogue – the main catalogue for digital ad print books, journals, newspapers, maps and scores, in the Library’s collection.

Monitoring data has been provided from available and published sources including Public Health Scotland COVID-19 Daily Dashboard[197], PHS Scotland statistical reports [198], NHS England [199], Business Insights and Conditions Survey (BICS)[200], Scottish Government ‘Attitudes to Coronavirus Tracker’ (YouGov)[201] and other sources where noted.

Medium term predictions of the impact of Covid-19 on the NHS, in terms of estimated number of infections, hospitalisations and ICU patients, were modelled by Scottish Government analysts.

Additional searches were conducted online, Google Advanced and Google Scholar, and some relevant scientific papers have been also included. However it should be noted that not all are peer reviewed, even those published in academic journals, such is the desire for speed around research in this area. Most of the resources included consider vaccine or negative coronavirus certification in a UK context, however there are some examples of EU and other international schemes as points of comparison.

[197] https://www.publichealthscotland.scot/media/10181/21-11-17-covid19-publication_report.pdf
[198] https://public.tableau.com/app/profile/phs.covid.19/viz/COVID-19DailyDashboard_15960160643010/Overview
[199] https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-vaccinations/covid-19-vaccinations-archive/
[200] Business and innovation statistics - gov.scot (www.gov.scot)
[201] Public attitudes to coronavirus: tracker - data tables - gov.scot (www.gov.scot)

Publications from SAGE, PHS, PHE and ONS were collated and assessed by the C-19 Evidence Team analysts and used as a primary source of information based on the credibility of the source and fact the data were prepared by a panel of experts. A scientific literature review carried out by the Scottish Government Central Library generated around 130 articles related to Covid certification. The most relevant search results were used by policy colleagues in their Impact Assessments and incorporated in this publication. Information from scientific literature was used to address gaps in areas not covered by official governmental publications and to reinforce the evidence base where necessary. Google searches were performed to gather international evidence on certification schemes. Those searches were guided by international assessments produced by the UK Government International Comparators Joint Unit (ICJU). The state of the epidemic is evolving constantly in both the UK and internationally therefore the most recent publications were used where possible.

Other sources of material researched and analysed by Scottish Government policy colleagues and analysts include:

- Papers from Scientific Advisory Group for Emergencies (SAGE)
- Publications from the Scottish Government
- Publications from the World Health Organisation (WHO)
- Publications from the International Comparators Joint Unit (ICJU)
- Publications from the Public Health Scotland (PHS)
- Publications from the Public Health England (PHE)
- Publications from the Office for National Statistics (ONS)
- Data from Our World in Data website
- YouGov polling data

Annex B – Vaccine effectiveness

Vaccine effectiveness against Delta in UK

- **Vaccine Effectiveness Expert Panel (VEEP**), published on 29 October 2021 the consensus view of vaccine effectiveness for different vaccines and doses and outcomes, which was reached on 24 September 2021[202]. The values presented in the table below are the consensus judgement of the Vaccine Effectiveness Expert Panel for Delta, they also published a table for Alpha (not shown here). The panel considers a wide range of domestic and international data, and draws a conclusion as to the most accurate values, given the data. Green shows high confidence (Evidence from studies is consistent and comprehensive), Orange shows medium confidence (Evidence is emerging but may be inconsistent requires further analysis) and Red shows low confidence (Little evidence is available at present and results are inconclusive).

Vaccine Product	Time since 2nd dose	Delta				
		Infection	Symptomatic	Hospitalisation	Death	Transmission
Oxford/AstraZeneca (Non-replicating viral vector) AZD1222	0-3 months	Insufficient Data	65% (60-75%)	95% (90-99%)	95% (85-99%)	Insufficient Data
	4-6 months	Insufficient Data	55% (45-65%)	85% (80-95%)	90% (85-99%)	Insufficient Data
	6+ months	Insufficient Data	45% (35-60%)	75% (65-80%)	80% (55-95%)	Insufficient Data
Pfizer-BioNTech (RNA) BNT162b2	0-3 months	Insufficient Data	90% (80-95%)	99% (90-99%)	99% (90-99%)	Insufficient Data
	4-6 months	Insufficient Data	75%(65-75%)	95% (90-99%)	95% (90-95%)	Insufficient Data
	6+ months	Insufficient Data	65% (55-75%)	90% (90-95%)	90% (85-95%)	Insufficient Data
Moderna (RNA) mRNA-1273	0-3 months	Insufficient Data	95% (90-95%)	99% (95-99%)	Insufficient Data	Insufficient Data
	4-6 months	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
	6+ months	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data

- **REal-time Assessment of Community Transmission (REACT-1)** - the UK study analysed swabs taken by nearly 100,000 people in England between 24 June 2021 and 12 July 2021, 100% of which were Delta variant. Based on the findings the researchers estimated that "fully vaccinated people in this testing round had between 50% - 60% reduced risk of infection, including asymptomatic infection, compared to unvaccinated people. In addition, double vaccinated

[202] Research and analysis overview: VEEP: Vaccine effectiveness table, 24 September 2021 - GOV.UK

people were less likely than unvaccinated people to test positive after coming into contact with someone who had COVID-19 (3.84% vs 7.23%)" [203] [204].

- **Office for National Statistics COVID-19 Infection Survey** is a large survey of randomly selected private households across the UK, where RT-PCR tests were performed following a schedule, irrespective of symptoms, vaccination and prior infection. ONS data from during the Delta period shows that two vaccine doses (14 days or more previously) reduced the risk of testing positive by 67% (95% confidence interval: 64% to 70%) compared to those not yet vaccinated (or 21 days or more before vaccination) without evidence of prior infection[205].
- **The EAVE II study** undertook cohort analysis of the population in Scotland and reported that from 1 April to 27 September 2021, there were 201 COVID-19 deaths in the group studied. In the 16-39 age bracket, 17 unvaccinated people died and no fully vaccinated people died. The Pfizer-BioNTech vaccine was 95% effective in 40-59 year olds and 87% effective in people 60+. The Oxford-AstraZeneca vaccine was 88% effective in 40-59 year olds and 90% effective in people aged 60+. In people of all ages who had been double-vaccinated at least two weeks before a positive PCR test, the vaccines offer around 90% against COVID-19 deaths caused by the Delta variant[206].

[203] REACT-1 round 13 interim report: acceleration of SARS-CoV-2 Delta epidemic in the community in England during late June and early July 2021 | medRxiv
[204] Coronavirus infections three times lower in double vaccinated people - REACT | Imperial News | Imperial College London
[205] Coronavirus (COVID-19) Infection Survey Technical Article: Impact of vaccination on testing positive in the UK - Office for National Statistics
[206] BNT162b2 and ChAdOx1 nCoV-19 Vaccine Effectiveness against Death from the Delta Variant | NEJM

Annex C - Societal views

Public polling

Data tables and methodology for Scotland sample 2nd-3rd November 2021

Methodology**:** This survey has been conducted using an online interview administered to members of the YouGov Plc UK panel of 800,000+ individuals who have agreed to take part in surveys. Emails are sent to panellists selected at random from the base sample. The e-mail invites them to take part in a survey and provides a generic survey link. Once a panel member clicks on the link they are sent to the survey that they are most required for, according to the sample definition and quotas. (The sample definition could be "GB adult population" or a subset such as "GB adult females"). Invitations to surveys don't expire and respondents can be sent to any available survey. The responding sample is weighted to the profile of the sample definition to provide a representative reporting sample. The profile is normally derived from census data or, if not available from the census, from industry accepted data. The figures have been weighted and are representative of all Scottish adults (aged 18+).

Question text: 'The Scottish Government has introduced a vaccine certification scheme for entry to nightclubs / other late night venues with music, dancing and alcohol and large events (that is unseated indoor live events with more than 500 people in the audience, unseated outdoor live events with more than 4,000 people in the audience, and any event that has more than 10,000 people in attendance). People visiting these venues or attending events of this size will have to show proof that they are fully vaccinated or exempt from vaccination before entering. The easiest way of doing this will be to show a QR code on the new Covid Status app, but you can also download a certificate or obtain a letter by visiting nhsinform.scot…'

Base: All Scottish Adults (n=1002)

Were you aware that this scheme has been introduced in Scotland?	
Unweighted base	1002
Base: All Scottish Adults	1002
Yes	93%
No	7%

To what extent do you support or oppose the introduction of this scheme?	
Unweighted base	1002
Base: All Scottish Adults	1002
Strongly support	35%
Tend to support	24%
Neither support nor oppose	13%

Tend to oppose	8%
Strongly oppose	16%
Don’t know	4%

You said previously that you have been to a large event or to a nightclub or other late night venue with music, dancing and alcohol. All of these now require a vaccine certificate or proof of exemption. With this in mind, which ONE of the following applies to you? If you have been to more than one of these events or late night outlets / nightclubs in the past week, please refer to your most recent visit.	
Unweighted base	85
Base: All Scottish Adults who have been to a large event	98
I was asked to show my vaccine certificate and I showed it	48%
I was asked to show my vaccine certificate, but I didn't show it	8%
I wasn't asked to show my vaccine certificate, but I showed it anyway	6%
I wasn't asked to show my vaccine certificate and I didn't show it	34%
I don't need a vaccine certificate because I have proof of exemption	1%
Prefer not to say	3%

Still thinking about the vaccine certification scheme that is now in place in Scotland…There is an app – the Covid Status app – which is part of this scheme. Which ONE of the following applies to you?	
Unweighted base	1002
Base: All Scottish Adults	1002
I have downloaded the Covid status app	36%
I have heard of the Covid status app but haven't downloaded it	44%
I haven't heard of the Covid status app	17%
Don't know	3%

I would like to see the scheme rolled out to other types of venue and events		I think that this will encourage more people to go to these venues/events		I recognise that this scheme is designed to help rather than hinder eligible businesses/events	
Unweighted base	1002	Unweighted base	1002	Unweighted base	1002
Base: All Scottish Adults	1002	Base: All Scottish Adults	1002	Base: All Scottish Adults	1002
Strongly agree	19%	Strongly agree	10%	Strongly agree	24%
Tend to agree	26%	Tend to agree	23%	Tend to agree	36%
Neither agree nor disagree	26%	Neither agree nor disagree	39%	Neither agree nor disagree	19%
Tend to disagree	12%	Tend to disagree	15%	Tend to disagree	10%
Strongly disagree	17%	Strongly disagree	14%	Strongly disagree	12%

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This publication is available at **www.gov.scot**

Any enquiries regarding this publication should be sent to us at

The Scottish Government
St Andrew's House
Edinburgh
EH1 3DG

ISBN: 978-1-80201-681-9 (web only)

Published by The Scottish Government, November 2021

Produced for The Scottish Government by APS Group Scotland, 21 Tennant Street, Edinburgh EH6 5NA
PPDAS981046 (11/21)