

Theme 3: The delivery of a system of testing, outbreak management and self-isolation

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Theme 3: The delivery of a system of testing, outbreak management and self-isolation

Executive Summary

In accordance with the terms of reference for Portfolio 1, this report focuses on theme 3: **The Scottish government's delivery of a system of testing, outbreak management and self-isolation**. The scope of the report is to provide information about the key events, key people/organisations and key documentation to assist the Scottish Inquiry with their investigation.

A detailed analysis is presented, including sources of information, key events and decisions and a list of questions and issues that the Inquiry may wish to explore. In addition, a detailed appendix table with the information for each key event is included. Details of our methodology are provided in the appendix.

The key sub-themes that emerged for this theme include: 3.1 the timing and evolution of the Scottish Government's COVID-19 testing and contact tracing strategies; 3.2 the implementation of these strategies; 3.3 the impact of decisions about testing on the most vulnerable.

The potential questions for the Inquiry to consider are:

Scottish Government's testing and contact tracing strategy

3.1.1 Timing of strategy: The Scottish Government's Framework for Decision Making was not published until 23 April 2020, a month after the country had gone into lockdown. The testing strategy was not published until 4 May 2020. Would it have been feasible to develop a strategy sooner? What steps can be taken to ensure that the Scottish Government has an outline testing plan and scalable testing infrastructure ready, should there be a resurgence or a future pandemic?

3.1.2 Transition to living with COVID-19: On 22 February 2022 the Scottish Government announced that the country would soon transition from a pandemic response strategy to a longer-term strategy where COVID-19 is an endemic disease. What ethical issues should be taken into account in decisions about when and how to phase out free mass testing and other pandemic control responses, and about how to balance the four harms? What infrastructure will be put in place to monitor the effectiveness of the longer-term strategy?

Implementation of the strategy

3.2.1 Inadequate testing capacity: Scotland (and the UK) had early warning of the likely impact of the pandemic, as it unfolded in late February and early March in Italy. Could the Scottish Government have acted sooner to mobilise additional testing capacity? What, if any, attempts were made during February and March 2020 to enlist the support of commercial and university laboratories in Scotland? What challenges were identified and how could they have been overcome? Did the Scottish Government capitalise on capacity

among groups with expertise in Scotland? For example, there was willingness, capacity and expertise across Scottish universities which was not used, particularly early on, when capacity was very low.

3.2.2 Use of testing as an alternative to self-isolation: Self-isolation requirements had significant impacts on the economy, on livelihoods (particularly for people not eligible for financial support) and on children's school attendance. Could LFD testing have been introduced earlier as an alternative to self-isolation for low-risk contacts to reduce the economic and educational impacts? How were the different benefits and harms assessed and balanced in making these decisions?

3.2.3 Uncertain access to testing in the future: How will testing be funded after the UK Government ends free mass COVID-19 testing on 1 April 2022? How will this affect different groups of the population?

3.2.4 Relative effectiveness of different testing strategies: How effective were specific testing strategies at different times and for different populations (for example, mobile PCR testing in hot-spots, LFD testing for students in December 2021, population-wide access to LFDs)? Were the right kinds of tests made available to the right people at the right times and in the right places? Could testing resources have been deployed differently/more effectively?

3.2.5 Test and Protect (Scotland's contact tracing system): How effective was this system at helping control the pandemic in Scotland? Scotland's system, rooted in local health protection teams, and run by the NHS, used a very different model to the outsourced approach adopted in England. What were the strengths and weaknesses of this approach? How did it perform compared to the English model? Did the approach taken in Scotland engender greater public trust? How responsive was it to peaks in transmission? Test and Protect was planned and organised centrally but delivered locally, by teams with public health expertise and local knowledge. Was there sufficient coordination between the centre and local teams? What are the views of people working to deliver the system at local and central level? How effective was Public Health Scotland at providing guidance and support? Will there be some lasting legacy, in terms of the increased capacity that now exists in local teams? What level of increased capacity is sustainable and needs to be sustained in the medium-to-long term? What evidence needs to be generated/analysed to answer these questions?

3.2.6 Protect Scotland (proximity tracking app): How effective was Scotland's proximity tracking app at reducing virus transmission? What are the privacy issues with this approach and how were they dealt with and prioritised?

Protecting the vulnerable

3.3.1 Testing to protect the vulnerable: According to a BBC report from April 2021, of the 10,000 COVID-19 deaths in Scotland at that point, around one third happened in care homes. Clearly, considering the level of mortality in care homes, this is a major issue for the Inquiry to explore. What lessons can be learned, both about testing capacity and about

testing prioritisation? To what extent did health care and public health ethics play into the decision-making here? Was the social care sector adequately represented on advisory and decision-making bodies? How were harms weighed up against each other? When was it clear that mortality rates in care homes were becoming high and that care homes were becoming key sites of transmission from hospitals?

Introduction

This is one chapter of a broader portfolio of work examining the public sector response to the COVID-19 pandemic in Scotland, the purpose of which is to assist the Inquiry in structuring its investigation of this complex subject. The focus of this chapter is the Scottish government's delivery of a system of testing, outbreak management and self-isolation.

Findings

This paper explores three sub-themes. These are: the Scottish Government's testing and contact tracing strategy; the implementation of that strategy; and the impact on vulnerable people of strategic decisions about testing. Each section starts with a brief overview of the sub-theme. There is then a timeline, highlighting key events and decisions. This is followed by more detailed analysis of key issues. Finally, we suggest potential questions that the Inquiry might wish to consider further.

Sub-theme 3.1: Scottish Government's testing and contact tracing strategy

Overview

This section describes the evolution of the Scottish Government's COVID-19 testing and contact tracing strategy. Key points for consideration are firstly, whether Scotland could have been better prepared at the start of the pandemic in terms of planning, testing capacity and infrastructure. Secondly, as we transition out of the pandemic, questions arise as to how quickly this should happen and based on what criteria.

Scotland's overall pandemic strategy is set out in COVID-19: Framework for Decision Making. This was first published on [23 April 2020](#) and updated on [23 February 2021](#), [22 June 2021](#) and [22 February 2022](#). The strategic aims have changed as the pandemic has evolved, and as new tools, such as vaccination, have become available. Scotland's testing strategy is one element of this overall pandemic strategy. The Scottish Government's testing strategy is laid out in three documents:

- [Coronavirus \(COVID-19\): test, trace, isolate, support strategy](#), published on 4 May 2020. [Coronavirus \(COVID-19\): Scotland's testing strategy - adapting to the pandemic](#), published on 17 August 2020.
- [Coronavirus \(COVID-19\) - testing strategy: update - March 2021](#), published on 17 March 2021.

The strategy uses different types of COVID-19 tests that work in different ways and provide different types of information, although their uses often overlap and have developed throughout the epidemic. There is a good explainer [here](#). In summary:

- **Polymerase chain reaction (PCR) tests** indicate whether there is viral genetic material present in the tested specimen. PCR tests are most commonly used for symptomatic testing (to detect whether someone with COVID-19 symptoms actually has the disease). They can also be used to test people who do not have symptoms, for example to ensure that health and care workers, people being admitted to hospital, people being discharged from hospital into care homes and international travellers coming into the country are free of disease.
- **Antigen tests such as lateral flow devices for antigens (LFD)** indicate whether a person has the virus now and is likely to be infectious to others. They are used primarily in asymptomatic people to check whether they have the virus before mixing with others (e.g., visiting relatives in a care home, going to work or school, going to a nightclub). More recently, their use has been extended to allow relaxation of some restrictions (for example as an alternative to proof of vaccination or self-isolation).
- **Tests for coronavirus antibodies** indicate whether a person has immunity to COVID-19 (either from having the disease or from vaccination). These are blood tests, which are primarily used for disease surveillance (to track the proportion of the population who have immunity to the disease).
- **Whole genome sequencing** (analysing the whole genome of the virus) is used to identify and track new variants of the virus.

Key events and decisions

- **Key Decision:** On 15 March 2020, Scotland moved from the “containment” to the “delay” phase of the pandemic. Hospital patients and healthcare workers were prioritised for testing, leaving limited capacity for testing and suppressing transmission in the community, including care homes (see [letter to health boards](#) from CMO; [SAGE 15 – 13-Mar-20](#)).
- On [3 April 2020](#) the Scottish Government announced targets for increasing access to testing for these prioritised groups.
- On [23 April 2020](#) the Scottish Government published its overall pandemic strategy, Coronavirus (COVID-19): framework for decision making.
- **Key Decision:** On [4 May 2020](#), the Scottish Government launched its Test, trace, isolate, support strategy.
- On [28 May 2020](#), the Scottish Government launched the Test and Protect programme, to put the strategy into operation.
- **Key Decision:** On [31 July 2020](#), the Scottish Government announced the development of a proximity tracking app, to enable the identification of strangers with whom a case has come into close contact.
- **Key Decision:** On [17 August 2020](#), the Scottish Government updated its testing strategy.
- On [23 February 2021](#) the Scottish Government updated its COVID-19 framework for decision making.

- On [23 October 2020](#) a Clinical and Scientific Review of the Testing Strategy was published.
- **Key Decision:** On [17 March 2021](#), the Scottish Government updated its testing strategy again.
- On [22 June 2021](#) the Scottish Government again updated its COVID-19 framework for decision making.

Test, trace, isolate, support strategy, May 2020

On [4 May 2020](#), the Scottish Government launched its Coronavirus (COVID-19): test, trace, isolate, support strategy. The strategy is operationalised through the [Test and Protect](#) programme, launched on 28 May 2020 and led by NHS Scotland. Test and Protect aims to test, trace, isolate and support people with COVID-19 and their close contacts (figure 1).

Contact tracing is organised differently in Scotland than in England. In England, it is organised at the national level through NHS Test and Trace. Each day, laboratories report positive COVID-19 test results to Public Health England (PHE), which aggregates and forwards all case information to NHS Test and Trace. NHS Test and Trace contracts all elements of their tracing operations to private companies [1]. In Scotland, contact tracing is delivered by health protection professionals in teams in local NHS health boards, coordinated centrally by the National Contact Tracing Centre (NCTC), which is managed by NHS National Services Scotland (NHS NSS). Public Health Scotland also has a role, through developing guidelines, digital systems and training resources [2].







Identify people with symptoms consistent with COVID-19 and ask them to self-isolate	Rapid testing to identify cases	Identify and trace close contacts of cases	Support self-isolation of cases (for at least 7 days) and close contacts (14 days)
<p>People reporting symptoms consistent with COVID-19 are asked to self-isolate and a test is arranged.</p> 	<p>Testing enables those who do not have COVID-19 to be released from self-isolation, and contact tracing to continue for positive cases.</p> 	<p>All cases are asked to self-identify close contacts, and are able to access telephone support.</p> <p>For low risk cases, all close contacts are provided with advice to self-isolate.</p>  <p>For high risk and complex cases specialist risk assessment and support to identify close contacts is available.</p> 	<p>Some cases and close contacts will be able to self-isolate easily</p>  <p>Others will need support to isolate.</p> 

Figure 3.1: [Scotland's Test and Protect system](#)

The immediate strategic priority was to build testing and contact tracing capacity, both of which were severely limited at the start of the pandemic (explored in detail in the next section). A key document for the Inquiry to review is a report of a Health and Sport Committee Evidence Session on testing, which took place on [27 May 2020](#).

In addition, the strategy aimed to enhance the digital infrastructure supporting the work of contact tracing teams. The [Digital Health and Care Institute](#) were engaged to develop a web-based tool, accessible on smartphones or computers, which would allow people to input details of their close contacts for sending directly and securely to contact tracing teams, significantly improving the efficiency and effectiveness of contact tracing processes (figure 2).

The test, trace, isolate, support strategy also included plans for a proximity tracking app, based on Bluetooth technology, to identify strangers with whom a case has come into close contact (for example, on public transport). The UK Government commissioned [NHSX](#) to develop an app for this purpose. The Scottish Government stated in [May 2020](#) that it was seeking greater involvement in the development of the UK app, particularly to ensure that it would dovetail with Scotland's approach to contact tracing. Scotland eventually developed its own app, using a different technological approach to UK Government app. This is described in more detail under "Sub-theme 2: implementation of the strategy".

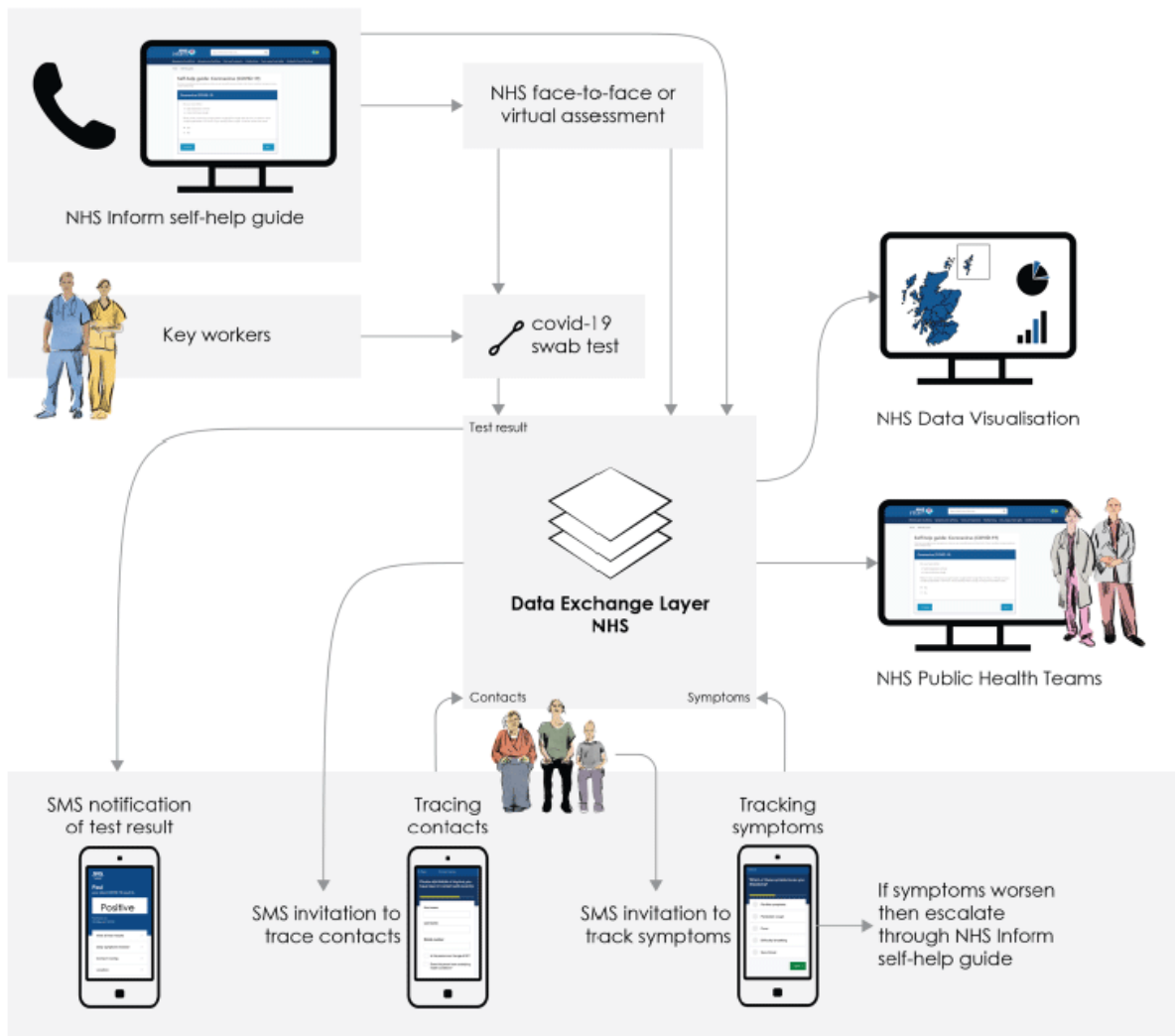


Figure 3.2: [DHI Digital Tool](#)

Testing strategy update, August 2020

On [17 August 2020](#), the Scottish Government updated its testing strategy, setting out five testing priorities:

- Testing people with symptoms;
- Finding cases proactively through contact tracing and testing in outbreaks;
- Routine symptomatic and asymptomatic testing to protect the vulnerable and prevent outbreaks in high-risk settings, such as care homes;
- Supporting direct patient care (to ensure the correct diagnosis of patients with COVID-19 symptoms and to support safe patient care within the NHS);
- Conducting surveillance to monitor transmission and better understand the disease.

Testing strategy update, March 2021

On [17 March 2021](#), the Scottish Government updated its testing strategy again, following publication of an update to Scotland's Strategic Framework on [23 February 2021](#) and a Clinical and Scientific Review of the Testing Strategy, published on [23 October 2020](#). This

update identified six reasons for testing, linked to minimising the “four harms” of the pandemic (Figure 3):

- **Testing to diagnose** and to enable rapid tracing and isolation of potential cases
- **Testing to care** (testing hospital admissions and people being discharged from hospitals to care homes)
- **Testing to protect** those most vulnerable to severe harm (routine testing in care homes and hospitals for the prompt identification and isolation of cases)
- **Testing to find** asymptomatic cases that would otherwise be undetected
- **Testing to support the resilience of essential services** (e.g., to support the safe return to school and higher education)
- **Testing to monitor** (disease surveillance).

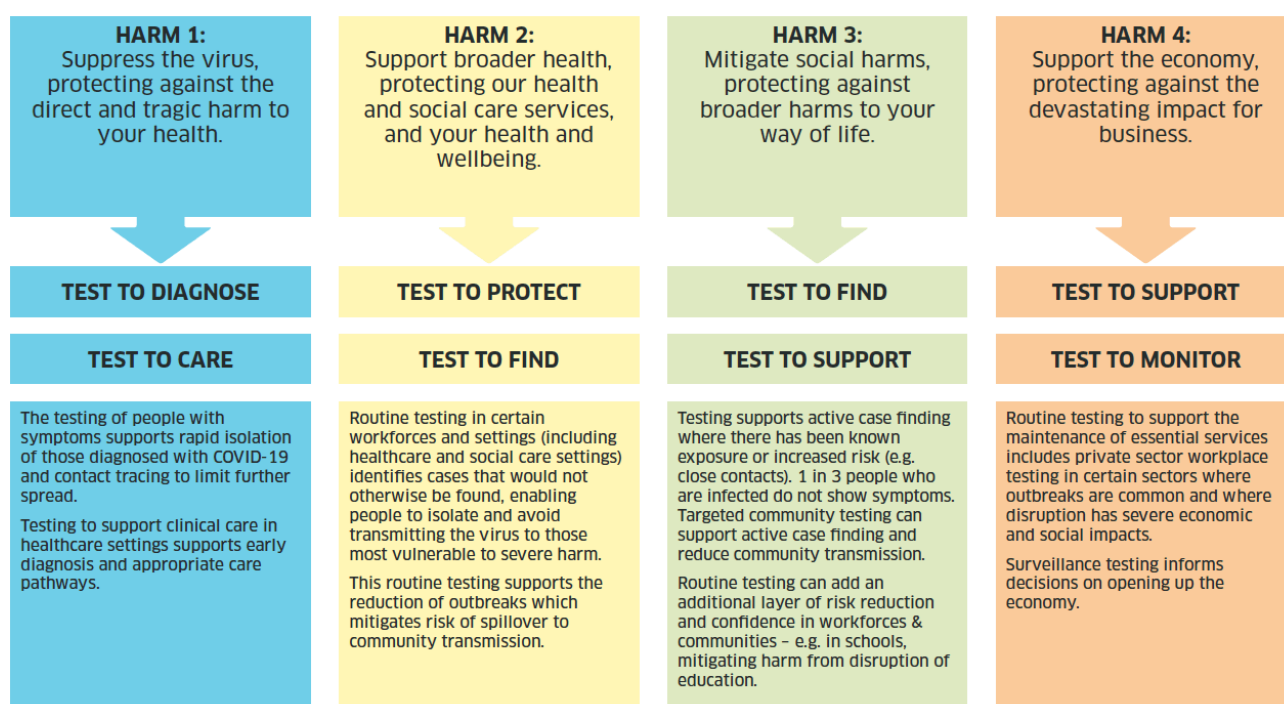


Figure 3.3: [Testing strategy: mitigating four harms](#)

Framework for decision making update, February 2022

On 22 February 2022, the Scottish Government announced an update to its overarching COVID-19 strategy, with a shift in focus from suppressing cases to recovery, management of the virus and building resilience, as the virus moves into the endemic phase. The strategic priorities of Test and Protect will now be to:

- Protect the most vulnerable and those at highest clinical risk
- Support patient care
- Monitor disease prevalence
- Respond to outbreaks
- Scale as required for future health threats.

The Scottish Government announced that it will publish a more detailed Test and Protect plan in March 2022, which will set out long term surveillance arrangements, details of scalable contingency infrastructure and provision of testing to support patient care and protect the clinically vulnerable.

In the meantime, there will be a transition phase, during which access to PCR and LFD testing will be supported. People with symptoms are still advised to book a PCR test and people testing positive are still advised to self-isolate. Contact tracing and advice and support to people who are self-isolating will continue. There will be a gradual scaling back of routine asymptomatic testing, with a reduction in the recommended frequency of testing, in line with clinical advice and risk assessments. At the end of the transition period, it is likely that contact tracing and isolation will focus on high-risk settings.

The surveillance plan will include ongoing participation in the UK-wide ONS COVID-19 Infection Survey, a wastewater surveillance programme with the Scottish Environment Protection Agency (SEPA) and Scottish Water, whole genome sequencing surveillance in collaboration with UKHSA and international partners and an enhancement of existing epidemiological surveillance systems in primary and secondary care.

Potential questions for the Inquiry to consider

- 3.1.1 Timing of strategy:** The Scottish Government's Framework for Decision Making was not published until 23 April 2020, a month after the country had gone into lockdown. The testing strategy was not published until 4 May 2020. Would it have been feasible to develop a strategy sooner? What steps can be taken to ensure that the Scottish Government has an outline testing plan and scalable testing infrastructure ready, should there be a resurgence or a future pandemic?
- 3.1.2 Transition to living with COVID-19:** On 22 February 2022 the Scottish Government announced that the country would soon transition from a pandemic response strategy to a longer-term strategy where COVID-19 is an endemic disease. What ethical issues should be taken into account in decisions about when and how to phase out free mass testing and other pandemic control responses, and about how to balance the four harms? What infrastructure will be put in place to monitor the effectiveness of the longer-term strategy?

Sub-theme 3.2: Implementation of the strategy

Overview

This section describes how the Scottish Government's COVID-19 testing and contact tracing strategy was implemented. Key points for consideration focus on Scotland's testing capacity at the start of the pandemic; the use of testing as an alternative to self-isolation; uncertainty about the accessibility of testing in the short- to medium-term; the relative effectiveness of different testing modalities for different purposes; and the effectiveness of Test and Protect (Scotland's contact tracing system) and Protect Scotland (Scotland's proximity tracking app).

At the start of the pandemic, Scotland, in common with the rest of the UK, had inadequate testing and contact tracing capacity. This had profound implications for our response to the pandemic. Lack of capacity challenged the Scottish Government's ability to identify and

swiftly isolate potential cases and thus suppress transmission. Difficult decisions had to be made about how to prioritise scarce resources. Testing capacity (two thirds provided by the UK Government and one third by the Scottish Government) increased steadily from April 2020 onwards, allowing the Scottish Government to expand access to testing.

Key events and decisions

- **Key Decision:** On 15 March 2020, Scotland moved from the “containment” to the “delay” phase of the pandemic. Hospital patients and healthcare workers were prioritised for testing, leaving limited capacity for testing and suppressing transmission in the community, including care homes (see [letter to health boards](#) from CMO; [SAGE 15 – 13-Mar-20](#)).
- On [3 April 2020](#) the Scottish Government announced targets for increasing access to testing for these prioritised groups.
- At the start of the pandemic, Scotland had the capacity to process only only [350](#) tests per day.
- On [1 May 2020](#) the Scottish Government announced that daily testing capacity had reached 8,350, exceeding targets. This consisted of 4,350 NHS tests (in laboratories in all 14 health boards) and 4000 from the UK-Government funded Glasgow Lighthouse Laboratory. As a result, eligibility for testing was expanded to include enhanced outbreak investigation and surveillance testing in care homes; symptomatic testing of all over 65s and their family members; symptomatic testing of people unable to work from home and their families.
- By [4 May 2020](#) NHS Scotland testing capacity was 4,350 samples a day.
- Two thousand additional contact tracing staff were recruited in time for the launch of Test and Protect in May 2020.
- On [28 May 2020](#), the Scottish Government launched the Test and Protect programme. This provided PCR testing at drive-through centres. Samples were processed at NHS laboratories and private laboratories contracted through the UK Government PCR testing programme.
- On [18 June 2020](#), the UK Government abandoned the development of their initial proximity tracking app because of technical problems.
- On [31 July 2020](#), the Scottish Government announced the development of a proximity tracking app (“Protect Scotland”), which alerts users if they have been in contact with another app user who has tested positive for the virus. The app uses different technology from the app initially developed by the UK Government.
- On [25 August 2020](#) the Scottish Government announced that work had begun to set up the first of eleven walk-through testing sites to increase both the capacity and the accessibility of testing.
- On [26 August 2020](#), the Scottish Government announced a £6.76 million deal with UK-based life sciences company LumiraDx to supply enhanced testing capacity particularly suited to meeting testing needs in more remote locations.
- Since [September 2020](#), Scotland has participated in the COVID-19 Infection Survey, a UK-wide surveillance survey conducted by the Office for National Statistics (ONS) and the University of Oxford.

- On [30 September 2020](#), the Scottish Government launched a £500 Self-Isolation Support Grant, which aimed to help those who would lose income if they needed to self-isolate.
- By [October 2020](#), an average of around 30,000 PCR tests a day were being processed, approximately one third by NHS Scotland laboratories and two thirds by the UK Government testing programme.
- On [11 November 2020](#) the Scottish Government announced plans for a COVID-19 student testing scheme, which aimed to support the safe return of up to 80,000 students ahead of the winter break.
- On [7 December 2020](#) the Self-Isolation Support Grant was extended to include a wider group of people.
- On [15 December 2020](#), the Scottish Government announced the opening of the first of three regional laboratory hubs set up to increase Scotland's PCR testing capacity.
- On [23 December 2020](#) the Scottish Government announced investment in wastewater sampling undertaken by the Scottish Environmental Protection Agency (SEPA) and Scottish Water to track COVID prevalence.
- By the end of December 2020, Scotland had a maximum testing capacity of more than 68,000 tests per day [3]. The Audit Scotland report does not specify whether this was total testing capacity or PCR testing capacity.
- At the end of 2020, Test and Protect, Scotland's contact tracing system, was coping well, achieving the WHO's benchmark of tracing and isolating 80% of close contacts within 3 days of a case being confirmed [3].
- In [January 2021](#), local authorities in areas with high coronavirus prevalence were invited to submit proposals for community and school testing initiatives.
- By the end of January 2021, daily testing capacity was 77,000, the majority (64 %) provided by the UK Government [3]. Again, it is not clear whether this refers to total or PCR testing capacity.
- On [2 February 2021](#) the Self-Isolation Support Grant was extended further.
- From [February 2021](#), a partnership between the Scottish Fire and Rescue Service (SFRS), Argyll and Bute Council, Highland Council, and NHS Highland made testing available from 21 fire stations across Highland and Argyll & Bute to increase access to testing in remote and rural areas.
- On [17 March 2021](#) Scotland's updated national testing strategy included £13 million investment in 2021/22 to establish a genomic sequencing service to track new COVID-19 variants.
- When schools fully reopened in April 2021, children and school staff were encouraged to do twice weekly LFD tests (Deputy First Minister statements, [19 February 2021](#) and [8 March 2021](#)).
- By [26 April 2021](#), everyone in Scotland was able to access rapid asymptomatic testing, using antigen-based lateral flow devices (LFD), either ordered online or collected from a pharmacy.

- From the beginning of 2021 until mid-May, Test and Protect continued to perform well, with over 90% of index cases consistently contacted within 24 hours, and most cases being closed within 48 hours.
- By [July 2021](#) a surge in cases driven by the Delta variant meant that Test and Protect was contacting record numbers of people a day, putting the system under pressure. Additional staff were deployed and systems were streamlined.
- On [9 July 2021](#), Ascensos, described in a Scottish Government announcement as one of Test and Protect’s “existing commercial partners”, and Barrhead Travel, a travel agency seeking to avoid laying off staff, agreed to provide 100 additional staff to support contact tracing. Additional contact tracing bank staff were also mobilised.
- Test and Protect processes were further streamlined on [24 August 2021](#) to help cope with case numbers.
- In the first week of [November 2021](#), 226,000 PCR tests were conducted.
- On [25 November 2021](#), Health Secretary Humza Yousaf announced a funding commitment of £33.1 million to keep Scotland's contact tracing workforce in place until September 2022.
- In the first week of [January 2022](#), 452,000 tests were conducted.

Inadequate testing capacity at the start of the pandemic

At the start of the pandemic, Scotland, in common with the rest of the UK, had inadequate testing capacity. Before commercial testing platforms became available, NHS National Services Scotland (NSS) used tests developed [in-house](#), based on protocols published by the World Health Organisation. Initially, only [350](#) tests could be processed per day in Scotland, split between NHS laboratories in Edinburgh and Glasgow. Insufficient testing capacity was not just an issue in Scotland: in early February 2020, SAGE noted that the UK’s testing capacity was limited and could not be substantially increased during the winter influenza season ([SAGE 4 – 04-Feb-20](#)).

Given the ease and speed with which the virus was able to transmit, the UK Government’s scientific advisers (SAGE) judged that it would not be feasible to contain the virus using contact tracing, once weekly numbers of new cases exceeded 50 (see [SAGE 4 – 04-Feb-20](#), [SAGE 8 – 18-Feb-20](#), [SAGE 9 – 20-Feb-20](#), [PHE 12-Feb-20](#), [PHE 20-Feb-20](#)).

Inadequate testing capacity continued to be an acute issue across the UK throughout March and April, although progress was starting to be made (see [SAGE 16 – 16-Mar-20](#), [SAGE 17 – 18-Mar-20](#), [SAGE 18 – 23-Mar-20](#), [SAGE 19 – 26-Mar-20](#), [SAGE 22 – 02-Apr-20](#), [SAGE 24 – 09-Apr-20](#), [SAGE 26 – 16-Apr-20](#) and related papers). In an interview for the Guardian newspaper on [26 February 2022](#), England’s Chief Medical Officer, Sir Chris Whitty, said that if he could choose one issue that would have improved the UK’s response to the pandemic, it would be to have speeded up the development of testing capacity early in the pandemic. He pointed to Germany as an example of a country which had managed to do this successfully.

Building testing capacity

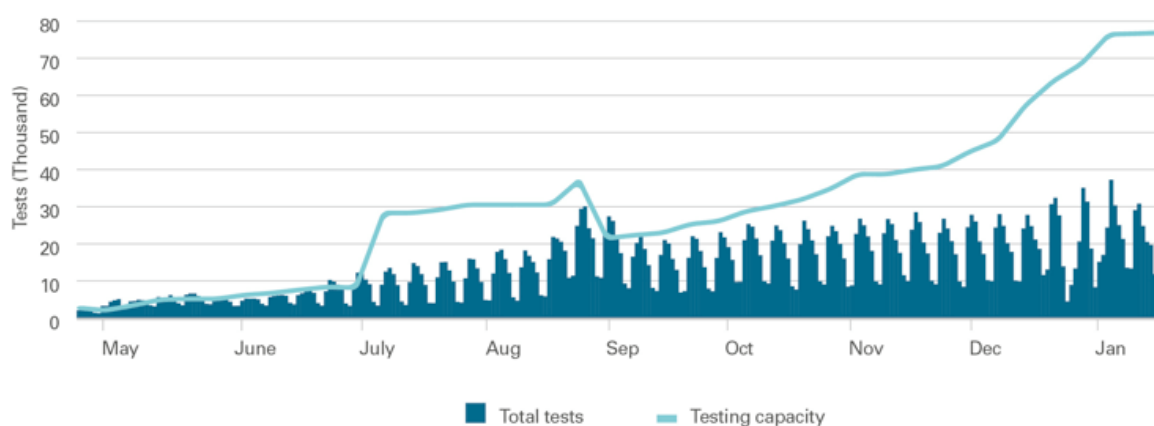
When it became clear that an expansion of testing capacity would be required on a massive scale, the UK Government sought the involvement of private laboratories and funded seven “Lighthouse Labs” across the country. These are UK Government-funded partnerships with universities and pharmaceutical companies. The Glasgow Lighthouse Lab (which opened in April 2020), is a university laboratory that has been repurposed to process COVID-19 swabs, using Glasgow University equipment. The laboratory processes tests from around the UK, but there is a guaranteed daily number of tests reserved for the Scottish population. The UK Government also provides a network of drive through and walk in sites across the country and funds test kits delivered to people’s homes. The UK Government testing system caters mostly for people with COVID-19 symptoms and close contacts of people who have tested positive. It now delivers around two thirds of COVID-19 testing in Scotland. The remaining third of testing is done by NHS Scotland. The NHS is responsible for testing in care homes and in hospitals, including symptomatic and routine asymptomatic testing of residents, patients and staff [4].

Figure 4 shows the number of tests conducted daily in Scotland and the daily testing capacity for April 2020 – January 2021. By the [beginning of May](#) 4,350 samples a day were being processed and over the next few months, testing capacity would steadily increase. Daily testing data is available [here](#). On [25 August 2020](#) the Scottish Government announced that work had begun to set up the first of eleven walk-through testing sites planned to be up and running before winter to increase both the capacity and the accessibility of testing. On [26 August 2020](#), the Scottish Government announced a £6.76 million deal with UK-based life sciences company LumiraDx to supply enhanced testing capacity particularly suited to meeting testing needs in more remote locations. By [October 2020](#), an average of around 30,000 tests a day were being processed, approximately one third by NHS Scotland laboratories and two thirds by the UK Government testing programme [3]. On [15 December 2020](#), the Scottish Government announced the opening of the first of three regional laboratory hubs set up to increase Scotland’s testing capacity. Establishment of the three hubs was led by National Services Scotland (NSS). The Glasgow (West) hub laboratory is managed by NHS Greater Glasgow and Clyde. The other two sites are Foresterhill in Aberdeen (North) and Lauriston Place in Edinburgh (East). By the end of December 2020, Scotland had a maximum testing capacity of more than 68,000 tests per day. This exceeded the Scottish Government’s target of 65,000 set earlier in the year [3]. By the end of January 2021, daily testing capacity was 77,000, the majority (64 %) provided by the UK Government [3].

Exhibit 1

Covid-19 testing capacity and total tests carried out from April 2020 to January 2021

The Scottish Government achieved its target to have capacity for 65,000 tests per day by the end of December 2020. The number of tests carried out has not yet increased in line with the additional capacity.



Notes:

1. In June 2020, Public Health Scotland and the Scottish Government began reporting total capacity as 'NHS Scotland capacity plus full capacity of the Glasgow Lighthouse lab'.
2. In August 2020, total capacity was calculated as NHS Scotland capacity plus a population share of the total UK lighthouse lab network.
3. Capacity data from 21 April to 11 October 2020 was reported by Public Health Scotland. Capacity data from 12 October was reported by NHS NSS and NHS England. Scotland's share of UK Government testing capacity is included from 30 June.

Source: Scottish Government and Public Health Scotland

Figure 3.4: COVID-19 testing capacity and total tests carried out, April 2020 to January 2021.

Source: [Audit Scotland, 2021](#)

Building contact tracing capacity

Contact tracing was also rapidly scaled up in the early months of the pandemic. Two thousand additional contact tracers, drawn from health boards, local authority environmental health teams and other NHS services, were rapidly recruited or redeployed in time for the launch of Test and Protect in May 2020 [3]. These are skilled roles: contact tracers not only gather data but must also conduct careful risk assessment and provide active support to those who are self-isolating.

At the end of 2020, the contact tracing system was coping well. The WHO's benchmark for a successful COVID-19 contact-tracing operation, endorsed by SAGE, is to trace and quarantine 80% of close contacts within 3 days of a case being confirmed ([SAGE 32 – 01-May-20](#)). Audit Scotland found that between November 2020 and January 2021, enough contacts of people testing positive with Covid-19 were traced for the system to work effectively [3].

In the first half of 2021, contact tracing continued to be a high performing aspect of Scotland's response to COVID-19, consistently performing well within the 72-hour end-to-end WHO criteria for closing contact tracing cases. From the beginning of 2021 until mid-May, over 90% of index cases were consistently contacted within 24 hours, and most cases were closed within 48 hours. However, a surge in cases driven by the Delta variant, first detected in India in late 2020, meant that Test and Protect was contacting record numbers of people a day by [July 2021](#), putting the system under pressure. To ensure that high risk cases (those most likely to lead to further transmission of the virus) were prioritised, SMS

text messages were introduced for low-risk cases, with direct telephone calls continuing to be used for the most high-risk cases. Individuals were encouraged to complete a digital contact tracing form, to enable contact tracers to triage cases in this way. The National Contact Tracing Centre also brought in additional surge workforce capacity in response. On [9 July 2021](#), Health Secretary Humza Yousaf announced that Motherwell-based call centre firm, Ascensos, described as one of Test and Protect's "commercial partners", agreed an arrangement with Barrhead Travel to accelerate and augment the capacity they were providing to the contact tracing system by 100 staff. The impact of COVID-19 on the travel industry meant that Barrhead Travel were keen to find ways of preserving jobs [5]. At the same time, additional contact tracing bank staff continued to be brought on board and existing bank staff mobilised. Further modifications to streamline processes were introduced on [24 August 2021](#). According to a news report, the arrangement with Ascensos and Barrhead Travel was partly to enable NHS staff (redeployed from other roles early in the pandemic) to return to their original roles and partly to expand the contact tracing workforce [5]. At her briefing on [21 October 2021](#), the First Minister insisted that contact tracing was not being outsourced to these companies, but that staff were recruited from the private sector to work in the NHS system.

On [25 November 2021](#), Health Secretary Humza Yousaf announced a funding commitment of £33.1 million to keep Scotland's contact tracing workforce in place until September 2022. This investment secured almost 500 posts at local health boards around the country, as well as additional core tracing staff at the National Contact Centre (NCC) and additional capacity from private suppliers to meet demand surges and ensure continuity in staffing levels. Work is now underway to identify the longer-term strategic approach to contact tracing.

Protect Scotland: contact tracing app

To complement the "human" contact tracing system, on [31 July 2020](#), the Scottish Government announced the development of a proximity tracking app ("Protect Scotland"), which alerts users if they have been in contact with another app user who has tested positive for the virus. It was developed by [Nearform](#), who developed similar apps for Republic of Ireland, Northern Ireland and Gibraltar, and was launched on [10 September 2020](#).

Protect Scotland uses a different technological approach from the proximity tracking app initially developed by the UK government. Both apps use Bluetooth proximity tracking technology; however, the UK Government app uses a centralised approach, which prioritises data availability to health services over user privacy. The Protect Scotland app uses a decentralised approach, which prioritises user privacy [6]. On [18 June 2020](#), the UK Government abandoned the development of their initial app because of technical problems.

On [28 October 2020](#), the Scottish Government announced an interoperability agreement, with Northern Ireland and Jersey, which meant that the Protect Scotland app would automatically work in those locations and the Northern Ireland and Jersey apps would automatically work in Scotland. On [5 November 2020](#), the Scottish Government announced an interoperability agreement with England and Wales for the Protect Scotland app.

A study which assessed user views of nine European national apps using a commercial app-review analytics tool to extract and mine 39,425 user reviews found that users were generally dissatisfied with the nine apps, except for the Scottish "Protect Scotland" app [7]. Nevertheless, by [4 July 2021](#) fewer than half the people who had downloaded Protect Scotland were actively using it (about 950,000 active users despite being downloaded more than two million times). Figures from Scottish Government indicated that 50,000 people stopped using the app during [July 2021](#), with the number of active users dropping to 902,000.

Expanding access to testing

As testing capacity increased, it was possible to contemplate asymptomatic testing at scale, targeted at particular groups, workplaces or geographic areas. On [11 November 2020](#) the Scottish Government announced plans for a COVID-19 student testing scheme using antigen-based LFDs, which aimed to support the safe return of up to 80,000 students ahead of the winter break (see also [SAGE 54 – 01-Sep-20](#), [SAGE 69 – 19-Nov-20](#), [SPI-M-O: COVID-19: Notes on the festive period, 19 November 2020](#)). On [25 November 2020](#), Health Secretary Jeane Freeman announced plans for an expansion in asymptomatic LFD testing for hospital patients, health and social care staff, and communities in areas of the country with a high prevalence of COVID-19. Following [successful trials](#) in early December 2020, the Scottish Government announced that local authorities in areas with high coronavirus prevalence would be invited to submit proposals for community and school testing initiatives in [January 2021](#). These would be delivered in partnership with NHS Boards and supported with additional funding and resources, including mobile testing units and asymptomatic test sites, to provide PCR and lateral flow testing respectively (see also [Health Secretary's statement - 23 December 2020](#), [SAGE 70 – 26-Nov-20](#), [Innova Lateral Flow SARS-CoV-2 Antigen test accuracy in Liverpool Pilot: preliminary data, 26 November 2020](#), [SPI-M: Mass testing of the whole population, 25 November 2020](#), [SPI-B: Behavioural considerations of health certificates in population mass testing, 26 November 2020](#), [PHE: Summary of analysis of non-medical sampling at regional testing sites versus Liverpool testing sites, 25 November 2020](#)).

To increase access to testing in remote and rural areas, a partnership between the Scottish Fire and Rescue Service (SFRS), Argyll and Bute Council, Highland Council, and NHS Highland made testing available from 21 fire stations across Highland and Argyll & Bute from [February 2021](#). Coastguard staff also help to deliver testing at Portree and Fort William.

When schools fully reopened in April 2021, there was sufficient capacity to introduce asymptomatic testing in schools. Pupils and staff were encouraged to do twice weekly LFD tests (Deputy First Minister statements, [19 February 2021](#) and [8 March 2021](#)). By [26 April 2021](#), everyone in Scotland was able to access rapid asymptomatic testing. Free lateral flow home test kits could be ordered online or by phone or collected from a network of walk-in or drive-through test sites. Access to test kits from community pharmacies was extended from [June 2021](#) to ensure that those without online access were not disadvantaged. The aim was to find asymptomatic cases that would otherwise go undetected, with people

encouraged to test themselves twice weekly, so that if they tested positive they could quickly self-isolate to avoid transmitting the virus to others.

Testing to support the resilience of essential services

Testing was also used effectively to support the resilience of essential services after the arrival of the Omicron variant. In [December 2021](#), the exponential growth of case numbers was putting pressure on the testing system and threatening essential services, as a growing proportion of the workforce was self-isolating. PCR testing for essential workers was prioritised to enable those testing negative to be exempt from self-isolation and return to work. In [January 2022](#), secondary pupils and staff in schools, early learning and childcare settings were advised to take at-home LFD tests before returning to school and twice weekly thereafter to limit the spread of the Omicron variant (see also [SAGE 99 – 16-Dec-21](#)). Testing was also allowed as an alternative to proof of vaccination ([December 2021](#)).

Self-isolation rules

The Chief Medical Officer (CMO) announced that from [13 March 2020](#), people with COVID-19 symptoms should stay at home for seven days. Their close contacts were advised to stay at home only if they began to experience symptoms. By the time the Scottish Government published its test, trace, isolate and support strategy on [4 May 2020](#), people with symptoms were asked to self-isolate immediately, take a test and remain in isolation for 7 days after positive test confirmation. Close contacts of a confirmed case were told to isolate for 14 days, regardless of symptoms.

On [30 July 2020](#), advice on self-isolation for people with COVID-19 symptoms or a positive test result changed from 7 to 10 days, based on clinical evidence that people with COVID-19 who are mildly ill and are recovering have a low but real possibility of infectiousness between 7 and 9 days after illness onset.

The effectiveness of self-isolation as a public health measure depends on high rates of population compliance. It is very burdensome for people to self-isolate, particularly if they are required to do so repeatedly and particularly for those in insecure employment, who may lose income if they miss work. To maximise compliance, it was important to ensure that the reasons for self-isolation were clearly communicated, that people were appropriately supported to self-isolate, including financially, and that self-isolation requirements were relaxed as soon as possible, compatible with safety.

On [30 September 2020](#), the Scottish Government launched a £500 Self-Isolation Support Grant, which aimed to help those who would lose income if they needed to self-isolate, such as those unable to carry out their work. This was extended on [7 December 2020](#) to include parents on low incomes whose children were self-isolating and people eligible for Universal Credit. It was extended again on [2 February 2021](#) to cover more people on low incomes: workers earning the Real Living Wage or less; those in receipt of a council tax reduction because of low income; and people with caring responsibilities for someone over 16 who is asked to self-isolate, where the carer meets the other eligibility criteria. The period during which people could apply for the Self-Isolation Support Grant was also extended, with applications allowed within 28 days of a person being told to self-isolate.

On [11 December 2020](#) the Scottish government reduced the required isolation period for contacts of positive cases from 14 to 10 days, following their review of the latest clinical evidence and taking into account the joint recommendation of UK CMOs from all four nations (see [SAGE 51 – 13-Aug-20](#), [SAGE 68 – 16-Nov-20](#)).

When children returned to school in April 2021, if someone in their school “bubble” tested positive for COVID-19, the entire bubble had to self-isolate for ten days. This caused significant disruption to learning and teaching, with some children having to self-isolate repeatedly.

In [July 2021](#), new rules were introduced allowing double-vaccinated people working in essential public services and critical national infrastructure to apply for exemption from self-isolation. To be exempt, people had to have a negative PCR test and undertake daily LFD tests. This was a temporary measure in response to high virus prevalence causing economic impact, but in an increasingly vaccinated population, where healthy, fully vaccinated people were now at much lower risk of severe COVID-19 outcomes (see [SAGE 83 – 11-Mar-21](#), [SPI-M-O: Statement on daily contact testing, 3 March 2021](#), [KCL and Bristol: Engagement with daily testing instead of quarantine following possible exposure to SARS-CoV-2, 11 March 2021](#), [Comparative performance of SARS CoV-2 lateral flow antigen tests demonstrates their utility for high sensitivity detection of infectious virus in clinical specimens, 11 March 2021](#), [CMMID: Daily testing of contacts: adherence, number of tests, speed of tracing, and lateral-flow test sensitivity, 11 March 2021](#)).

As Scotland moved beyond level 0 on [9 August 2021](#), it was announced that adult close contacts would no longer be automatically required to self-isolate for 10 days and double-vaccinated, symptom-free adults with COVID-19 would be able to end self-isolation with a negative PCR test. The same conditions applied to children, even if unvaccinated (with children under five not required to take a PCR test). The previous approach of isolating whole classes in schools was also abolished at this point.

When Omicron hit, self-isolation rules were strengthened: from [11 December 2020](#), household contacts had to self-isolate for 10 days, regardless of vaccination status or negative PCR test result (non-household contacts had to self-isolate pending a negative PCR test). This was to slow down the spread of Omicron, particularly as not much was known about its severity at that time.

These rules were relaxed on [6 January 2022](#). People testing positive for COVID-19 could now end self-isolation if they were fever free and had negative LFD tests on Days six and seven. Children and triple vaccinated adult close contacts no longer needed to self-isolate, if they returned a negative LFD test result each day for seven consecutive days and remained fever free. Unvaccinated or partially vaccinated close contacts still had to self-isolate for 10 days and take a PCR test.

Testing to enable disease surveillance

Early in the pandemic, the Scottish Government established a surveillance network that included forty-one GP locations, which collected and submitted samples from suspected

patients, irrespective of their travel history. At the time, this was considered a “precautionary measure” to provide an early warning of community transmission [8].

Since [September 2020](#), Scotland has participated in the COVID-19 Infection Survey, conducted by the Office for National Statistics (ONS) and the University of Oxford, on behalf of the UK, Scottish, Welsh and Northern Irish Governments in a random sample of households. The primary objective of the study is to estimate the number of people in the population (symptomatic and asymptomatic) who test positive for COVID-19 on nose and throat swabs. The survey, which is conducted weekly, produces important data for estimating the R number and for understanding the socio-demographic characteristics of people contracting COVID-19. The study also collects blood samples for the detection of COVID-19 antibodies. The study aims to collect 15,000 swab samples per fortnight and 12,500 blood tests per month in Scotland [9].

On [23 December 2020](#) the Scottish Government announced that wastewater sampling undertaken by the Scottish Environmental Protection Agency (SEPA) and Scottish Water to track COVID prevalence would be expanded from 60 to around 200 tests per week throughout Scotland by the end of January 2021, supported by £1.1 million in additional funding. The purpose of the planned expansion was to better target community testing. SAGE noted that wastewater surveillance is a cost-effective method to detect the presence of SARS-CoV-2 viral RNA in wastewater and to identify different strains of the virus ([SAGE 69 – 19-Nov-20](#)). It can be used when disease prevalence is low to detect outbreaks [10]. Where prevalence is high, modelling wastewater surveillance data can also quantify the total number of individuals infected in a sewershed [11].

The updated national testing strategy on [17 March 2021](#) announced £13 million investment in 2021/22 to establish Scotland’s own genomic sequencing service to track new COVID-19 variants. Capable of identifying the genetic origins of up 1000 cases a day when fully built, the service will support Scotland’s preparedness for any future pandemics, as well as other threats such as antibiotic resistance.

On [21 February 2022](#), Boris Johnson announced that free mass COVID-19 PCR and LFD testing would end on 1 April 2022. When this happens, maintaining robust surveillance will be crucial to providing an early warning or increasing transmission or the emergence of new variants.

Potential questions for the Inquiry to consider

3.2.1 Inadequate testing capacity: Scotland (and the UK) had early warning of the likely impact of the pandemic, as it unfolded in late February and early March in Italy. Could the Scottish Government have acted sooner to mobilise additional testing capacity? What, if any, attempts were made during February and March 2020 to enlist the support of commercial and university laboratories in Scotland? What challenges were identified and how could they have been overcome? Did the Scottish Government capitalise on capacity among groups with expertise in Scotland? For example, there was willingness, capacity and expertise across Scottish universities which was not used, particularly early on, when capacity was very low.

- 3.2.2 Use of testing as an alternative to self-isolation:** Self-isolation requirements had significant impacts on the economy, on livelihoods (particularly for people not eligible for financial support) and on children’s school attendance. Could LFD testing have been introduced earlier as an alternative to self-isolation for low-risk contacts to reduce the economic and educational impacts? How were the different benefits and harms assessed and balanced in making these decisions?
- 3.2.3 Uncertain access to testing in the future:** How will testing be funded after the UK Government ends free mass COVID-19 testing on 1 April 2022? How will this affect different groups of the population?
- 3.2.4 Relative effectiveness of different testing strategies:** How effective were specific testing strategies at different times and for different populations (for example, mobile PCR testing in hot-spots, LFD testing for students in December 2021, population-wide access to LFDs)? Were the right kinds of tests made available to the right people at the right times and in the right places? Could testing resources have been deployed differently/more effectively?
- 3.2.5 Test and Protect (Scotland’s contact tracing system):** How effective was this system at helping control the pandemic in Scotland? Scotland’s system, rooted in local health protection teams, and run by the NHS, used a very different model to the outsourced approach adopted in England. What were the strengths and weaknesses of this approach? How did it perform compared to the English model? Did the approach taken in Scotland engender greater public trust? How responsive was it to peaks in transmission? Test and Protect was planned and organised centrally but delivered locally, by teams with public health expertise and local knowledge. Was there sufficient coordination between the centre and local teams? What are the views of people working to deliver the system at local and central level? How effective was Public Health Scotland at providing guidance and support? Will there be some lasting legacy, in terms of the increased capacity that now exists in local teams? What level of increased capacity is sustainable and needs to be sustained in the medium-to-long term? What evidence needs to be generated/analysed to answer these questions?
- 3.2.6 Protect Scotland (proximity tracking app):** How effective was Scotland’s proximity tracking app at reducing virus transmission? What are the privacy issues with this approach and how were they dealt with and prioritised?

Sub-theme 3.3: Impact on vulnerable people of strategic decisions about testing

Overview

This section describes the impact of strategic decisions about testing on frail, elderly people living in Scotland’s care homes. The key point for consideration is whether lessons can be learned, both about testing capacity and about testing prioritisation.

A key strategic objective of Scotland’s testing strategy is to use routine testing to protect the vulnerable and prevent outbreaks in high-risk settings, such as care homes. This was not, however, the main priority at the start of the pandemic. During February 2020 the NHS prepared for an anticipated influx of seriously ill patients needing hospital care by

“assertively discharging patients” from hospital, with an estimated 900 people in Scotland discharged from hospital to care homes early in the epidemic [12]. At the same time, scarce testing resources were focused on diagnosing COVID-19 in symptomatic patients admitted to hospital and on testing NHS frontline staff with COVID-19 symptoms. Care home residents with symptoms of COVID-19 were not routinely offered testing until 15 April 2020. Patients discharged from hospital to care homes were not routinely offered testing for COVID-19 until 21 April 2020. An estimated two fifths of care homes in Scotland had an outbreak of COVID-19 between March and May 2020 [13]. According to a BBC report from April 2021, of the 10,000 COVID-19 deaths in Scotland at that point, around one third happened in care homes [14].

Key events and decisions

- **Key Decision:** On [13 March 2020](#) the Scottish Government issued guidance to care homes which stressed the importance of long-term care facilities continuing to accept patients discharged from hospital to support the freeing up of hospital capacity for anticipated COVID-19 cases. There was no requirement at this time for patients discharged from hospital into care homes to be PCR tested.
- **Key Decision:** On 15 March 2020, Scotland moved from the “containment” to the “delay” phase of the pandemic. Hospital patients and healthcare workers were prioritised for PCR testing, leaving limited capacity for testing and suppressing transmission in the community, including care homes (see [letter to health boards](#) from CMO; [SAGE 15 – 13-Mar-20](#)).
- **Key Decision:** On 26 March 2020 the Scottish Government issued updated guidance to care homes, reiterating the importance of care homes accepting patients discharged from hospital. A negative PCR test was not routinely required and care homes with a single confirmed case of COVID-19 (or more than one case in some circumstances) could remain open to new admissions ([26 March update](#)).
- **Key Decision:** On [15 April 2020](#) the First Minister announced that all symptomatic care home residents would be offered PCR testing for COVID-19 where appropriate (see [letter from Cabinet Secretary for Health and Sport, 22 April 2020](#)). Previously, only the first residents in a care home to become symptomatic were tested.
- **Key Decision:** On [21 April 2020](#) the Cabinet Secretary for Health and Sport announced that hospital patients should have two negative PCR tests before being discharged to care homes and should be isolated for 14 days.
- On [28 April 2020](#) the First Minister announced that PCR testing would be introduced for all those over 70 admitted to hospital for any reason - not just those with COVID symptoms. Patients in this category would be tested on admission, and then every four days throughout their stay in hospital.
- **Key Decision:** On [1 May 2020](#) the First Minister announced that expansion in PCR testing capacity meant that it was now possible to provide enhanced outbreak investigation in all care homes with a COVID-19 outbreak (defined as care homes with at least one case of COVID-19). All staff and residents would now be offered testing. Testing would also be carried out in any care homes run by the same operator and sharing staff (to prevent transmission between care homes). Finally,

surveillance testing of asymptomatic staff and residents would be carried out in care homes.

- **Key Decision:** On [15 May 2020](#) the Scottish Government issued updated guidance for care homes. This stated the presumption that all residents being admitted to a care home should now have a negative PCR test before admission.
- **Key Decision:** On [18 May 2020](#), the First Minister announced that from 25 May 2020, all social care staff would be offered routine, weekly PCR testing.
- From [8 July 2020](#) this was extended to NHS staff working in specialist cancer services, providing long-term care for the elderly or working in residential mental health.
- On [7 December 2020](#) the Scottish Government announced a trial of lateral flow device (LFD) testing of care home visitors, to add another layer of protection for vulnerable elderly residents, with plans for rapid expansion from 14 December 2020.

Impact on people living in care homes

The UK's move from the "containment" to the "delay" phase of the pandemic on 15 March 2020 had profound implications for care homes. From this point, the Scottish Government's priority was to maintain a functioning hospital system, in anticipation of a spike in COVID-19 admissions. To achieve this, hospital patients and healthcare workers were prioritised for testing, leaving limited capacity for testing and suppressing transmission in the community, including care homes (see [letter to health boards](#) from the CMO, [SAGE 15 – 13-Mar-20](#)). On [13 March 2020](#) the Scottish Government issued guidance to care homes. This stated that:

"There are situations where long term care facilities have expressed concern about the risk of admissions from a hospital setting. In the early stages where the priority is maximising hospital capacity, steps should be taken to ensure that patients are screened clinically to ensure that people at risk are not transferred inappropriately but also that flows out from acute hospital are not hindered and where appropriate are expedited".

There was no requirement at this time for patients discharged from hospital into care homes to be tested.

On 26 March 2020 the Scottish Government issued [updated guidance](#)¹ to care homes, which reiterated the importance of care homes accepting patients discharged from hospital. The guidance stated that individuals could be discharged from hospital to care homes with a risk assessment and provision of advice about self-isolation, but that a negative COVID-19 test was not routinely required. People admitted to care homes from the community also did not need to be tested for COVID-19. Furthermore, the guidance stated that care homes with a single confirmed case of COVID-19 (or more than one case in some circumstances) could remain open to new admissions. At this time, only the first residents in a care home to become symptomatic were tested.

¹ This is part of a Freedom of Information package. Scroll down to find the 26 March guidance update.

The Care Inspectorate did not begin collecting data on care homes that had reported a suspected COVID-19 case until 11 April 2020 [15]. At that point, 406 care homes (37 % of all care homes) had had COVID-19 cases. From this point onwards, testing requirements for care homes were strengthened, but only incrementally. On [15 April 2020](#) the First Minister announced that all symptomatic care home residents would be clinically assessed and, where appropriate, offered testing for COVID-19 (see [letter from Cabinet Secretary for Health and Sport, 22 April 2020](#)). On [21 April 2020](#) the Cabinet Secretary for Health and Sport announced that hospital patients should have two negative COVID-19 tests before being discharged to care homes and should be isolated for 14 days. On [28 April 2020](#) the First Minister announced that testing would be introduced for all those over 70 admitted to hospital for any reason - not just those with COVID symptoms. Patients in this category would be tested on admission, and then every four days throughout their stay in hospital. This policy stopped short of the policy in England, where NHS trusts were starting to test every patient admitted to hospital (previously only symptomatic patients were tested) ([SAGE 28 – 23-Apr-20](#)). On [1 May 2020](#) the First Minister announced that in all care homes with a COVID-19 outbreak (at least one case of COVID-19), all staff and residents would be offered testing. Testing would also be carried out in any care homes run by the same operator and sharing staff, and surveillance testing of asymptomatic staff and residents would be carried out. On [15 May 2020](#) updated guidance for care homes stated the presumption that all residents being admitted to a care home should now have a negative test before admission. By this point there had been COVID-19 cases in 629 Scottish care homes (58 % of all care homes) [15]. On [18 May 2020](#), the First Minister announced that from 25 May 2020, all social care staff would be offered routine, weekly testing. From [8 July 2020](#) this was extended to NHS staff working in specialist cancer services, providing long-term care for the elderly or working in residential mental health. On 4 June 2020, the Scottish Parliament Health and Sport Committee held an evidence session on the impact of COVID-19 on people in care homes. The [report](#) of this session is likely to be an important document for the Inquiry to consider.

Potential questions for the Inquiry to consider

3.3.1 Testing to protect the vulnerable: According to a BBC report from April 2021, of the 10,000 COVID-19 deaths in Scotland at that point, around one third happened in care homes. Clearly, considering the level of mortality in care homes, this is a major issue for the Inquiry to explore. What lessons can be learned, both about testing capacity and about testing prioritisation? To what extent did health care and public health ethics play into the decision-making here? Was the social care sector adequately represented on advisory and decision-making bodies? How were harms weighed up against each other? When was it clear that mortality rates in care homes were becoming high and that care homes were becoming key sites of transmission from hospitals?

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Appendices

Methods

Sources

We used the following sources to identify the key events or decisions, key players and key documents for theme 3.

1. A [timeline](#) by the Scottish Parliament Information Centre that focuses on Scotland's response to the Coronavirus (COVID-19) pandemic and includes all major developments. The timeline runs from 31/12/2019 and was last accessed on 11/02/2022.
2. Three timelines of the COVID-19 pandemic in Scotland for [2020](#), [2021](#) and [2022](#) by Wikipedia, last accessed on 11/02/2022.
3. [Minutes and papers](#) from the Scientific Advisory Group for Emergencies (SAGE) meetings.
4. [Minutes and papers](#) from the Scottish Government Covid-19 Advisory Group.
5. Reports and Correspondence of the [Health & Sport Committee](#).
6. To source academic literature in relevant topics we searched the [COVID-END inventory of "best evidence syntheses"](#), which presents the current state of evidence for COVID-19 related issues to support decision-makers.

Data extraction and event prioritisation

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

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

Results and discussion of the main findings

Key events together with dates, key players and relevant documentation in relation to testing issues are presented in **Table 3.1**. From reviewing the timeline, the following key sub-themes emerged, which we present in three categories:

1. An overview of the Scottish Government's evolving COVID-19 testing and contact tracing strategies
2. An examination of how the strategies were implemented
3. A consideration of the impact of decisions about testing on the most vulnerable: residents of Scotland's care homes

We describe each sub-theme separately by presenting the main events, key issues and potential areas for investigation.

Table 3.1: Key sources

<p>Detailed issues identified in public consultation: The discharge of patients from hospital into care homes without testing had a major impact on frail elderly people, their relatives and care home staff. A priority for many respondents was for the Inquiry to investigate the decisions taken and the reasons for them. People also wanted to understand the reasons for stopping testing early in the pandemic. Respondents wanted to see a whole system approach to understanding decisions around testing, to understand how guidance was developed and decisions taken.</p>
<p>Additional issues identified by UNCOVER: We have identified key decision points and rationales. We also highlight a severe lack of testing capacity early in the pandemic, and late development of strategic plans.</p>
<p>Impact on equalities: Elderly people resident in care homes were particularly affected by decisions around testing. Children and young people were also particularly disadvantaged, through two extended periods of school closure. Could faster rollout of routine mass testing for asymptomatic people have enabled schools to reopen earlier? People who are clinically vulnerable may face disadvantage as we transition out of the pandemic phase, particularly with uncertainty about access to free testing. The Scottish Government instituted a number of initiatives to make testing accessible to people who are digitally excluded, people in remote rural areas and people without access to private transport.</p>

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
Feb 2020	Strategy and capacity		<p>SAGE and related papers: SAGE 4 – 04-Feb-20 SAGE 8 – 18-Feb-20; PHE: Clinical virology of SARS-CoV-2, 17 February 2020 SAGE 9 – 20-Feb-20; PHE: Recommendations on the continuing use of case-identification, contact-tracing and case and contact isolation (CCI) management to mitigate the impact of imported cases of COVID-19, 12 February 2020 PHE: When to stop contact tracing - developing triggers from PHE systems, 20 February 2020</p> <p>FoI request:</p>	In February 2020 it was becoming clear that testing and contact tracing systems across the UK were inadequate.

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
			<p>COVID-19 testing scientific advice: FOI release published 27 Aug 20</p> <p>Academic papers: https://www.bmj.com/content/369/bmj.m1932</p>	
01-Mar-20	Surveillance	Chief Medical Officer (CMO), Catherine Calderwood	<p>News article: https://www.bbc.co.uk/news/uk-scotland-51690868</p>	Surveillance network that included forty-one GP locations was set up to submit samples from suspected patients irrespective of their travel history. This was considered to be a “precautionary measure” to provide an early warning of community transmission.
13-Mar-20 Key Decision: Care homes urged not to impede discharge of patients from acute hospitals.	Protecting the vulnerable and preventing outbreaks in high risk settings	Jeane Freeman, Cabinet Secretary for Health and Sport	<p>Scottish Government documents: Letter to IJB Chief Officers from Cabinet Secretary, 13 March 2020</p> <p>Papers from the Health and Sport Committee: Evidence session on the impact of COVID-19 in care homes, 4 June 2020</p>	
13-Mar-20 People with symptoms to stay at home for 7 days	Self-isolation	CMO	<p>Scottish Government documents: https://www.gov.scot/news/people-with-symptoms-told-to-stay-at-home/</p> <p>FOI requests: COVID-19 changes to self-isolation and testing requirements: FOI release published 19 Oct 2021</p>	People with COVID-19 symptoms should stay at home for seven days. Their close contacts were advised to stay at home only if they began to experience symptoms.
15-Mar-20 Key Decision: Testing resources switched from community to hospitals, as	Strategy and capacity; Protecting the vulnerable and preventing outbreaks in	Catherine Calderwood, Chief Medical Officer (CMO)	<p>Scottish Government documents: https://www.gov.scot/publications/coronavirus-covid-19---implications-of-move-to-delay-phase-cmo-letter-15-march-2020/</p> <p>SAGE and related papers: SAGE 15 – 13-Mar-20</p>	

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
Scotland and UK move from “containment” to “delay” phase	high risk settings			
16-Mar-20 to 28-Apr-20 Ongoing insufficient testing and contact tracing capacity	Strategy and capacity		<p>Scottish Government documents:</p> <p>Coronavirus (COVID-19) update: First Minister’s speech 28 April 2020</p> <p>NHS in Scotland 2020 (Audit Scotland, 2021)</p> <p>SAGE and related papers:</p> <p>SAGE 16 – 16-Mar-20</p> <p>SAGE 17 – 18-Mar-20</p> <p>SAGE 18 – 23-Mar-20</p> <p>SAGE 19 – 26-Mar-20</p> <p>SAGE 22 – 02-Apr-20</p> <p>SAGE 24 – 09-Apr-20</p> <p>A note on mass testing for COVID-19: preliminary analysis, 6 April 2020</p> <p>SAGE 26 – 16-Apr-20</p> <p>SAGE 32 – 01-May-20</p> <p>Scottish Government Covid-19 Advisory Group:</p>	

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
			<p>https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-2-april-2020/</p> <p>https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-6-april-2020/</p> <p>https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-13-april-2020/</p> <p>FOI requests: COVID-19 testing development and capacity: FOI release published 5 Oct 20</p>	
<p>26-Mar-20 Key Decision: Guidance: Negative COVID-19 test not routinely required for discharge from hospital to care home</p>	<p>Protecting the vulnerable and preventing outbreaks in high risk settings</p>	<p>Jeane Freeman, Cabinet Secretary for Health and Sport, Catherine Calderwood, Chief Medical Officer (CMO)</p>	<p>Scottish Government documents: Clinical guidance for nursing home and residential care residents and COVID-19, 26 March 2020 (Part of a FOI request – scroll half way down to find this document)</p> <p>Evidence synthesis: Frazer K et al (2020) A rapid systematic review of measures to protect older people in long-term care facilities from COVID-19</p> <p>Academic papers: Bell et al, 2020 Burton JK (2021) Burton JK (2020)</p>	
<p>15-Apr-20 Key Decision: All symptomatic care home</p>	<p>Protecting the vulnerable and preventing outbreaks in</p>	<p>Jeane Freeman, Cabinet Secretary for Health and Sport</p>	<p>Scottish Government documents: Coronavirus (COVID-19) update: First Minister's speech 15 April 2020</p>	<p>Previously, only the first residents in a care home to become symptomatic were tested.</p>

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
residents to be tested	high risk settings		Letter from Cabinet Secretary for Health and Sport to all Scottish Care Homes, 22 April 2020	
21-Apr-20 Key Decision: Hospital patients to be tested for COVID-19 before discharge into care homes	Protecting the vulnerable and preventing outbreaks in high risk settings	Jeane Freeman, Cabinet Secretary for Health and Sport	Scottish Government documents: Coronavirus (COVID-19) update: Health Secretary's statement 21 April 2020 Coronavirus (COVID-19) update: Health Secretary Statement to Parliament 28 April 2020 News report: https://www.bbc.co.uk/news/uk-scotland-58738972	Hospital patients should have two negative COVID-19 tests before being discharged to care homes, and should be isolated for 14 days.
01-May-20 Key Decision: All care home staff and residents to be tested in homes where there is an outbreak	Protecting the vulnerable and preventing outbreaks in high risk settings	Jeane Freeman, Cabinet Secretary for Health and Sport	Scottish Government documents: Coronavirus (COVID-19) update: First Minister's speech 1 May 2020	
04-May-2020 Key Decision: Scottish Government launches Test and Protect Strategy	Strategy and capacity	Cabinet Secretary for Health and Social Care	Scottish Government documents: Test and Protect rolled out nationally Coronavirus (COVID-19): test, trace, isolate, support strategy SAGE and related papers: SAGE 30 – 30-Apr-20 SAGE 32 – 01-May-20	

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
			<p>Estimated impact of testing quarantined contacts at different points in time, 30 April 2020</p> <p>Estimated impact of delay from isolation of symptomatic case to test result and quarantine of contacts, 26 April 2020</p> <p>NERVTAG and SPI-M: Extraordinary meeting on contact tracing – minutes, 26 April 2020</p> <p>Scottish Government Covid-19 advisory group:</p> <p>https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-7-may-2020/</p> <p>https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-18-june-2020/</p> <p>FOI requests:</p> <p>Various questions regarding Test and Protect emails: FOI release published 5 Oct 20</p> <p>Questions related to NHS Test and Protect: FOI release published 23 Nov 20</p> <p>COVID-19 number of active users using NHS Test and Protect app: FOI release published 27 Sep 21</p> <p>Breakdown of Test and Protect self-isolation numbers: FOI release Published 2 Feb 22</p> <p>Breakdown of alerts sent from Test and Protect app: FOI release Published 4 Feb 22</p>	

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
			<p>Various questions regarding COVID-19 testing: FOI release published 1 Oct 20</p> <p>COVID-19 Test and Protect app : FOI release published 10 Dec 20</p> <p>Cost of processing a PCR test for Covid-19: FOI release published 20 July 21</p> <p>COVID-19 Testing rates per head of population: FOI review published 11 Nov 21</p> <p>COVID 19 Coronavirus testing: FOI release published 13 Dec 21</p> <p>Academic papers: Pagliari (2020)</p> <p>Other relevant documents: Audit Scotland, 2021</p> <p>Digital Health and Care Institute</p> <p>NHSX</p>	
<p>15-May-20 Key Decision: Guidance: all residents admitted to</p>	<p>Protecting the vulnerable and preventing outbreaks in</p>	<p>Jeane Freeman, Cabinet Secretary for Health and Sport</p>	<p>Scottish Government documents: National Clinical and Practice Guidance for Adult Care Homes in Scotland during the COVID-19 Pandemic</p>	

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
care home should be tested	high risk settings			
25-May-2020 Key Decision: Routine weekly testing for all social care staff	Protecting the vulnerable and preventing outbreaks in high risk settings	Jeane Freeman, Cabinet Secretary for Health and Sport	Scottish Government documents: Coronavirus (COVID-19) update: First Minister's speech 18 May 2020	Previously surveillance was done in only a sample of care homes.
27-May-20 Scottish Parliament Health and Sport Committee evidence session on testing	Testing strategy and its implementation	Cab Sec for Health and Sport, Jeane Freeman	Health and Sport Committee documents: Scottish Parliament Evidence Session on testing, 17 May 2020 Letter from Convener Health and Sport Committee to Cab Sec for Health and Sport, 9 June 2020	Health and Sport Committee questions Cab Sec for Health and Sport on the Scottish Government's testing strategy. Covers testing capacity, whether Scotland could have been better prepared and moved more quickly to develop capacity, prioritizing groups for testing, asymptomatic testing.
08-Jun-20 to 23-Dec-20 Travel restrictions to prevent importation of cases from countries with high prevalence	Travel restrictions	Justice Secretary Humza Yousaf	Scottish Government documents: https://www.gov.scot/news/new-health-measures-for-travellers-to-scotland/ https://www.gov.scot/publications/covid-19-international-travel-measures/ SAGE and related papers: SAGE 42 – 18-Jun-20 PHE: Investigation into the effectiveness of 'double testing' travellers incoming to the UK for signs of COVID-19, 17 June 2020 Serial testing to minimise false negatives, 16 June 2020	With Scotland's relatively low infection rate, importation of new cases from abroad was a significant risk to public health during the summer of 2020. This period saw changes in quarantine policy for travellers based on monitoring of case numbers in countries from where they were travelling. 8 June - general measures covering all countries (14 days self-isolation for people entering UK from abroad, online passenger locator form prior to travel (contact details and address where self-isolating), spot checks and fines. 25, 30 July , 20 August , 3, 10 September , 1, 15, 22, 29 October , 5, 7, 12, 26 November , 19 December , 9 Jan 2021 - 14 day quarantine

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
			<p>FOI requests:</p> <p>COVID 19 hotel quarantine: FOI release published 24 Aug 21</p> <p>Information regarding quarantine on travellers returning from Portugal: FOI release published 19 Nov 20</p> <p>COVID-19 Introduction of quarantine: FOI release published 19 Jan 21</p> <p>Covid-19 international travel quarantine: FOI release published 15 Jul 21</p> <p>Covid 19 managed isolation and quarantine: FOI release published 24 Aug 21</p> <p>Number of hotel rooms used for international flight quarantine: FOI release published 14 April 21</p> <p>COVID-19 Managed Isolation numbers of passengers arriving at Scottish airports: FOI release published 29 Apr 21</p> <p>COVID-19 hotel quarantine: FOI release published 13 May 21</p> <p>Covid-19 mandatory hotel quarantine breakdown: FOI release published 29 Jun 21</p> <p>Covid-19 hotel quarantine: FOI release published 3 Aug 21</p> <p>COVID-19 test for international travel: FOI release published 23 Sep 21</p>	<p>(reduced to 10 days from 11 Dec 2020) for specific countries with high levels of virus. Relaxation of restrictions for travellers from specific countries, where risk is judged to be sufficiently low - 8 July, 13, 20 August, 10 September, 1, 15, 22 October, 12, 26 Nov.</p> <p>SAGE 42 - agreed that double testing of travellers could enable quarantining terms of less than 14 days (double testing significantly reduces risk of false negatives). If initial testing is carried out prior to travellers entering the UK, the duration of quarantine in the UK could be shortened further (with the caveat that travellers should self-isolate between testing and travelling). Pre-testing of this kind would require international agreements and common standards.</p> <p>FOI requests are about quarantine and managed (hotel) quarantine.</p>

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
			<p>Self isolation requirements for seafarers: FOI release published 8 Sep 21</p> <p>COVID-19 total number of bookings for the Managed Quarantine Services: FOI release published 14 Oct 21</p> <p>Covid 19 managed isolation and quarantine: FOI review published 26 Oct 21</p> <p>COVID-19 tests for passengers via Corporate Travel Management (CTM) website: FOI release published 27 Sep 21</p> <p>COVID-19 details of Corporate Travel Management (CTM) relating to PCR tests: FOI release published 30 Sep 21</p> <p>Information regarding the source of PCR test kits: FOI release published 11 Oct 21</p> <p>Approval of PCR test kits for international arrivals: FOI review published 11 Oct 21</p> <p>Evidence syntheses: Nussbaumer-Streit B, et al. Quarantine alone or in combination with other public health measures to control COVID-19: A rapid review. Cochrane Database of Systematic Reviews. 2020;(4)CD013574.</p> <p>Burns J et al (2021) International travel-related control measures to contain the COVID-19 pandemic: a rapid review</p> <p>National Collaborating Centre for Methods and Tools. Rapid Review: Are any jurisdictions using isolation periods other than 14 days in response to COVID-19?. Hamilton, ON: National Collaborating Centre for Methods and Tools; 2020.</p>	

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
30-Jul-20: Extension of period of self-isolation from 7 to 10 days to minimise risk of transmission	Self-isolation	UK Chief Medical Officers	UK Government documents: https://www.health-ni.gov.uk/news/statement-uk-chief-medical-officers-extension-self-isolation-period-30-july-2020	In line with UK guidance, advice on self-isolation for those in the community who have COVID-19 symptoms or a positive test result changed from 7 to 10 days based on evidence that shows that people with COVID-19 who are mildly ill and are recovering have a low but real possibility of infectiousness between 7 and 9 days after illness onset.
31-Jul-20: Key Decision: Scottish Government announce development of contact tracing app	Strategy and capacity	Health Secretary Jeane Freeman; Cian Ó Maidín, CEO, NearForm	Scottish Government documents: https://www.gov.scot/news/contact-tracing-app-development/ Other relevant documents: Audit Scotland, 2021 NearForm company website Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-10-august-2020/	App announced on 31 July 2020, launched 10 September 2020.
17-Aug-20: Scottish Government updates testing strategy	Strategy and capacity	Health Secretary Jeane Freeman	Scottish Government documents: Scotland's COVID-19 Testing Strategy Health and Sport Committee correspondence: Letter from cabinet secretary to convener, health and sport committee, 17 August 2020 Correspondence of Health and Sport Committee (n.b. this document is not directly related to the 17 August launch of a new strategy, but it is about strategic arrangements in relation to testing):	

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
			Correspondence from Cab Sec Health and Sport to Convener of Health and Sport Committee, 3 Feb 21	
25-Aug-20 Expanding testing capacity and making testing more accessible	Strategy and capacity	Health Secretary Jeane Freeman	Scottish Government documents: https://www.gov.scot/news/increasing-capacity-and-accessibility-of-testing/	Scottish Government announce that work has begun to set up the first of eleven walk-through testing sites planned to be up and running before winter to increase capacity and accessibility of testing
26-Aug-20 Expanding testing capacity and making testing more accessible	Strategy and capacity	Ivan McKee, Minister for Trade, Investment and Innovation; Chief executive and chairman of LumiraDx Ron Zwanziger	Scottish Government documents: https://www.gov.scot/news/12-minute-covid-tests/	A £6.76 million deal is struck between the Scottish Government with UK-based life sciences company to extend testing capacity
10-Sep-20 Key Milestone: Launch of Protect Scotland app	Strategy and capacity	Health Secretary Jeane Freeman; Cian Ó Maidín, CEO, NearForm	Scottish Government documents: Protect Scotland app launches Health and Sport Committee correspondence: Letter from Cab Sec for Health and Sport to Convener of Health and Sport Committee, 10 Feb 21 FOI requests: Protect Scotland contact tracing app questions: FOI release published 4 March 2021 Protect Scotland App user statistics: FOI release published 8 March 2021	

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
			<p>Communication with local authorities relating to Protect Scotland app: FOI release published 31 March 2021</p> <p>COVID 19 NHS Scotland Protect Scotland App statistics: FOI release published 8 June 2021</p> <p>COVID 19 Contact tracers and Protect Scotland app statistics: FOI release published 9 Aug 2021</p> <p>Information regarding Protect Scotland App users: FOI release published 8 Oct 21</p> <p>Breakdown of Protect Scotland app: FOI release published 3 Feb 22</p>	
17-Sep-20 Scotland starts to participate in ONS surveillance survey	Surveillance		<p>Scottish Government documents: https://www.gov.scot/news/scotlands-covid-19-testing-strategy/</p> <p>ONS COVID-19 Infection Survey: information</p> <p>ONS, 2022</p> <p>SAGE and related papers: SAGE 22 – 02-Apr-20 SAGE 30 – 30-Apr-20 SAGE 32 – 01-May-20</p> <p>Evidence syntheses: Foster CR et al (2021) A scoping review of the experience of implementing population testing for SARS-CoV-2</p>	<p>UK-wide ONS surveillance survey – infections and antibodies. 15,000 Scottish samples</p> <p>SAGE 22 - discussed the need for a testing strategy linked to the UK’s overall strategy for managing the pandemic. Need to set clear targets. Quality of testing, interpretation and comms is crucial to avoid incorrect results or misinterpreted results, leading to unsafe behaviours or unsafe demands being made of workers by employers.</p> <p>Evidence synthesis: A scoping review assessing the performance of different testing modalities (eg: drive-through, home visiting, mobile testing, indoor walk-through centres and outdoor walk-through centres)</p>

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
			<p>Mallett S, et al (2020) At what times during infection is SARS-CoV-2 detectable and no longer detectable using RT-PCR-based tests? A systematic review of individual participant data.</p> <p>Arevalo-Rodrigues I, et al (2020) False-negative results of initial RT-PCR assays for COVID-19: A systematic review</p> <p>Mohammadi A, et al (2020) SARS-CoV-2 detection in different respiratory sites: A systematic review and meta-analysis</p> <p>Dinnes J et al (2021) Rapid, point-of-care antigen and molecular-based tests for diagnosis of SARS-CoV-2 infection.</p>	
30-Sep-20: Financial support for people self-isolating	Self-isolation	Social Security Secretary Shirley-Anne Somerville	<p>Scottish Government documents: https://www.gov.scot/news/new-grant-for-those-self-isolating/</p> <p>Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-21-september-2020/</p>	
07-Nov-20 to 27-Nov-21 Travel restrictions to delay the importation of new variants	Travel restrictions	Cabinet Secretary for Transport, Infrastructure and Connectivity	<p>SAGE meetings and papers: SAGE 42 – 18-Jun-20</p> <p>SAGE 71 – 03-Dec-20</p>	<p>To delay the importation of new variants, travel restrictions were introduced for travellers from specific countries on 7 Nov (Denmark), 23 Dec (South Africa), 9 January 2021 (several countries - South Africa variant), 14 January (several countries, Brazil)</p>

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
		Michael Matheson	LSHTM and the University of Manchester/the Alan Turing Institute: Comparison of quarantine and testing strategies to prevent onwards infection from infected travelers returning to the UK from abroad, 1 December 2020	<p>variant), 28 January (various countries, S Africa variant), 3 June (Portugal green to amber - Delta), 17 July (France - beta), 27 Nov (South Africa, Namibia, Lesotho, Eswatini, Zimbabwe, Botswana - Omicron). From 18 January 2021 there was also a requirement for a pre-departure test.</p> <p>SAGE 42 – discussed double testing of travellers to enable quarantining terms of less than 14 days (double testing significantly reduces risk of false negatives). If initial testing is carried out prior to travellers entering the UK, the duration of quarantine in the UK could be shortened further (with the caveat that travellers should self-isolate between testing and travelling). Pre-testing of this kind would require international agreements and common standards.</p> <p>SAGE 71 considered a paper on the number of SARS CoV-2 infections potentially resulting from returning travellers under different quarantine and testing strategies including quarantine, test to release, and daily lateral flow testing with isolation if positive.</p>
11-Nov-20 Scottish Government announces mass	Capacity	Further and Higher Education Minister Richard Lochhead	<p>Scottish Government documents: https://www.gov.scot/news/helping-students-home-safely-at-end-of-term/</p> <p>SAGE and related papers:</p>	<p>SAGE 54 – discussed whether mass testing of university students would prevent outbreaks.</p> <p>SAGE 69 - discussed risks and plans for Christmas. Targeting LFT e.g. offering tests to</p>

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
asymptomatic testing scheme for students			<p>SAGE 54 – 01-Sep-20</p> <p>SAGE 69 – 19-Nov-20</p> <p>SPI-M-O: COVID-19: Notes on the festive period, 19 November 2020</p> <p>Scottish Government Covid-19 Advisory Group : https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-5-october-2020/</p> <p>https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-19-october-2020/</p> <p>FoI requests: COVID-19 testing for University students: FOI release published 2 Nov 20</p> <p>COVID-19 testing of students in Scottish universities: FOI release published 8 April 21</p> <p>COVID-19 Student testing rollout and marketing costs: FOI release published 27 Apr 21</p> <p>COVID-19 Correspondence concerning mass population testing: FOI release published 20 May 2021</p>	younger people before going home/visiting older people more at risk, could be disproportionately beneficial.
25-Nov-20	Strategy and capacity	Health Secretary Jeane Freeman	<p>Scottish Government documents: https://www.gov.scot/news/testing-expansion-update/</p> <p>SAGE and related papers: SAGE 28 – 23-Apr-20</p> <p>Evidence synthesis:</p>	SAGE 28 – This came much later than in England. At the SAGE 28 meeting on 23 April 2020, it was announced that NHS trusts in England would start testing every patient admitted to hospital from 27 April 2020.

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
			Frazer K et al (2020) A rapid systematic review of measures to protect older people in long-term care facilities from COVID-19	Evidence synthesis: Rapid review examining the impact of mass testing in long-term care facilities on controlling the spread of COVID-19
02-Dec-20 Scottish Government announces first Community Asymptomatic Test site	Capacity	Health Secretary Jeane Freeman; NHSGGC's Director of Public Health Dr Linda de Caestecker; Renfrewshire Council Leader Iain Nicolson	<p>Scottish Government documents: https://www.gov.scot/news/community-asymptomatic-test-site-opens-in-johnstone/</p> <p>SAGE and related papers: SAGE 70 – 26-Nov-20</p> <p>Innova Lateral Flow SARS-CoV-2 Antigen test accuracy in Liverpool Pilot: preliminary data, 26 November 2020</p> <p>SPI-M: Mass testing of the whole population, 25 November 2020</p> <p>SPI-B: Behavioural considerations of health certificates in population mass testing, 26 November 2020</p> <p>PHE: Summary of analysis of non-medical sampling at regional testing sites versus Liverpool testing sites, 25 November 2020</p> <p>Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-2-november-2020/ https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-16-november-2020/</p>	SAGE 70 – Discussed pilot testing of mass LFT ongoing in Liverpool, and mass testing discussed at this meeting. SAGE endorsed 2 important uses for widespread testing: repeated and frequent targeted testing of higher risk or prevalence groups and institutions; to reduce risk when activities are already occurring (for example, to reduce the number of infectious people entering an indoor environment)
07-Dec-20 LFD testing for care home visitors	Protecting the vulnerable and preventing	Health Secretary Jeane Freeman;	<p>Scottish Government documents: https://www.gov.scot/news/testing-for-care-home-visitors-gets-underway/</p>	

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
	outbreaks in high-risk settings	Health and Social Care Partnerships; Scottish Care; CCPS; COSLA	<p>Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-3-december-2020/</p> <p>Health and Sport Committee correspondence: Letter from Cab Sec for Health and Sport to Convener of Health and Sport Committee, 2 Dec 2020</p>	
07-Dec-20 Financial support for people self-isolating	Self-isolation.	Social Security Secretary Shirley-Anne Somerville	<p>Scottish Government documents: https://www.gov.scot/news/more-people-can-claim-self-isolation-support-grant/</p> <p>Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-19-october-2020/</p>	
11-Dec-20 Isolation period for contacts of positive cases in Scotland reduced from 14 to 10 days	Self-isolation	UK Chief Medical Officers; Health Secretary Jeane Freeman	<p>Scottish Government documents: https://www.gov.scot/news/reduction-in-self-isolation/</p> <p>SAGE and related papers: SAGE 51 – 13-Aug-20 SAGE 68 – 16-Nov-20</p>	<p>SAGE 51 – called for more evidence to determine how adherence varies with the length of an isolation period and practical incentives for isolation. SAGE reiterated that a test and release strategy could be implemented.</p> <p>SAGE 68 - considered the use of LFT or PCR tests to reduce/replace quarantine by repeat testing upon tracing. Contacts of known index cases are currently required to quarantine for 14 days. As previously advised, a shorter period might be more effective in reducing transmission if it results in more people coming forward for testing and/or improves adherence to quarantine (see SAGE 67).</p>

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				However, there is a trade-off with increased transmission risk from those who are still infectious beyond the end of the quarantine period. Significant uncertainty exists around the modelling, so piloting is needed before any decision should be taken.
15-Dec-20 Key Milestone: First regional laboratory hub opens	Strategy and capacity		Scottish Government documents: First regional hub laboratory goes live Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-3-december-2020/	
23-Dec-20 Expansion of wastewater sampling surveillance	Surveillance	Health Secretary Jeane Freeman; SEPA; Scottish Water	Scottish Government documents: https://www.gov.scot/news/community-testing-to-be-introduced-from-january/ https://www.gov.scot/publications/covid-vaccines-testing-programmes-health-secretarys-statement-wednesday-23-december/ SAGE and related papers: SAGE 69 – 19-Nov-20 Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-30-december-2020	SAGE 69 - Wastewater surveillance is a cost-effective method to detect the presence of SARS-CoV-2 viral RNA in wastewater and to identify diversity of SARS-CoV-2 strains between and within cities. SAGE noted plans to use wastewater sampling to support mass testing across various cities in England. Work is underway to better understand how wastewater surveillance can be used in areas with a high proportion of asymptomatic individuals, for example universities, as well as in settings such as schools, hospitals and high-density accommodation. Current measurements and comparison with test and trace suggest that detection is typically at least as good as 1 infected person in 1,000, though this is dependent on local plumbing, and on the significant variability in faecal

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
				shedding rates of SARS-CoV-2 from individuals.
02-Feb-21 Financial support for people self-isolating	Self-isolation	Social Security Secretary Shirley-Anne Somerville	Scottish Government documents: https://www.gov.scot/news/more-people-supported-to-self-isolate/	
23 Feb 2021- <u>Key Decision: Decision-making framework:</u> Scottish Government publish the updated Strategic Framework, setting out the broad order of priority for re-opening and the conditions that need to be met to start lifting restrictions.	Updated strategic framework		<p>Scottish Government documents: Coronavirus (COVID-19): Strategic Framework update - February 2021</p> <p>Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-18-february-2021/</p> <p>Evidence syntheses: Burns J et al (2021) International travel-related control measures to contain the COVID-19 pandemic: a rapid review</p> <p>Pang J K et al (2021) Probability and estimated risk of SARS-CoV-2 transmission in the air travel system</p> <p>Grépin KA et al (2021) Evidence of the effectiveness of travel-related measures during the early phase of the COVID-19 pandemic: a rapid systematic review</p>	<p>This document updates the original Strategic Framework to take account of important developments, including: new and highly infectious strains of the virus progress with the vaccination roll-out</p> <p>The strategic intent remains: to suppress the virus to the lowest possible level and keep it there, while striving to return to a more normal life for as many people as possible.</p> <p>The Framework explains how all of the tools available will be used to achieve these aims: vaccination testing and contact tracing (Test and Protect) protective measures and the levels system travel restrictions to reduce the risk of new cases and strains coming into Scotland (importation measures) ensuring adherence to the rules and guidance (adherence to measures) support for people and businesses</p>

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
				The document does not provide fixed dates, because there are too many uncertainties. Instead, it sets out the conditions that need to be met to start lifting restrictions in a safe way. It provides details of the broad order of priority for re-opening , with the main priority continuing to be education. It espouses a gradual easing of restrictions on other areas of life as the virus is suppressed.
26-Feb-21 Testing made more accessible in remote rural areas, in partnership with SFRS	Strategy and capacity	Public Health Minister Mairi Gougeon; Assistant Chief Officer Stuart Stevens, Director of Service Delivery for the Scottish Fire and Rescue Service (SFRS); Coast Guard	Scottish Government documents: https://www.gov.scot/news/fire-station-testing-expansion-complete/ Health and Sport Committee correspondence: (This letter is about rural accessibility in general, not specifically this initiative) Letter from Cab Sec for Health and Sport to Convener of Health and Sport Committee, 22 Dec 2020	
17-Mar-21: Key Decision: Update to strategy; genomic surveillance	Strategy and capacity; surveillance	Health Secretary Jeane Freeman	Scottish Government documents: https://www.gov.scot/publications/scotlands-testing-strategy-update-march-2021/ https://www.gov.scot/news/scotlands-testing-strategy-update/ Public Health Scotland paper: https://www.rcpe.ac.uk/college/journal/public-health-scotland-first-year-successes-and-lessons	SAGE 96 – noted that there should be no complacency around the risk posed by further viral evolution. Ensuring sufficient testing and sequencing capacity to monitor for variants and capability to characterise new variants and conduct predictive vaccinology is crucial. SAGE noted recent discussions on the significant level of infections sequenced and border surveillance measures that are required to identify new variants within

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			<p>SAGE and related papers: SAGE 96 – 14-Oct-21</p> <p>Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-30-december-2020</p>	specified timeframes following their emergence.
26-Apr-21: Everyone in Scotland now has access to asymptomatic testing	Strategy and capacity	Chief Medical Officer Dr Gregor Smith	<p>Scottish Government documents: https://www.gov.scot/news/regular-rapid-testing-for-everyone/</p> <p>FoI request: Lateral flow device testing universal accessibility rollout communication: FOI release published 10 Aug 21</p>	
09-Jun-21: Improved access to asymptomatic testing, community pharmacies	Strategy and capacity	Heath Secretary Humza Yousaf; Professor Harry McQuillan, Community Pharmacy Scotland	<p>Scottish Government documents: https://www.gov.scot/news/rapid-test-kits-rolled-out-to-pharmacies/</p>	
03-Jul-21 Changes to contact tracing procedures in response to increasing case numbers	Strategy and capacity	Health Secretary Humza Yousaf	<p>Scottish Government documents: https://www.gov.scot/news/test-and-protect-to-prioritise-high-risk-cases/</p> <p>News article: https://www.bbc.co.uk/news/uk-scotland-57705375</p> <p>Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-27-may-2021/</p>	

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
04-Jul-21 Fewer people using Protect Scotland app	Strategy and capacity		News article: https://www.bbc.co.uk/news/uk-scotland-57715950	
09-Jul-21 Contact tracing workforce increased to cope with rising case numbers	Strategy and capacity	Health Secretary Humza Yousaf	Scottish Government documents: https://www.gov.scot/news/more-staff-to-bolster-test-and-protect/	
23-Jul-21 Testing replaces self-isolation for essential staff in critical roles	Self-isolation		<p>Scottish Government documents: https://www.gov.scot/news/self-isolation-rules/</p> <p>SAGE and related papers: SAGE 83 – 11-Mar-21</p> <p>SPI-M-O: Statement on daily contact testing, 3 March 2021</p> <p>KCL and Bristol: Engagement with daily testing instead of quarantine following possible exposure to SARS-CoV-2, 11 March 2021</p> <p>Comparative performance of SARS CoV-2 lateral flow antigen tests demonstrates their utility for high sensitivity detection of infectious virus in clinical specimens, 11 March 2021</p> <p>CMMID: Daily testing of contacts: adherence, number of tests, speed of tracing, and lateral-flow test sensitivity, 11 March 2021</p> <p>Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-5-august-2021-2/</p>	SAGE 83 - Modelling shows that daily testing of contacts may be a suitable alternative to quarantine in some situations, and provide other benefits (less days missed school etc)

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
			FoI requests: COVID-19 close contact isolation: FOI release published 6 Oct 21	
24-Jul-21 Fewer people using Protect Scotland app	Strategy and capacity		News article: https://www.bbc.co.uk/news/uk-scotland-57941343	
09-Aug-21 Vaccinated close contacts no longer required to self-isolate	Self-isolation		Scottish Government documents: https://www.gov.scot/news/scotland-to-move-beyond-level-0/	
24-Aug-21 Changes to contact tracing procedures in the light of increasing case numbers	Strategy and capacity	Health Secretary Humza Yousaf	Scottish Government documents: https://www.gov.scot/news/supporting-test-and-protect/	
25-Nov-21 Scottish Government announce future plans for contact tracing workforce	Strategy and capacity	Health Secretary Humza Yousaf	Scottish Government documents: https://www.gov.scot/news/contact-tracing-workforce-safeguarded/	
06-Dec-21 Negative LFD can now be used as alternative to	Capacity	Deputy First Minister John Swinney; National	Scottish Government documents: https://www.gov.scot/news/negative-test-becomes-part-of-certification-scheme/	

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
proof of vaccination for entry to venues		Contact Tracing Centre	https://www.gov.scot/news/negative-test-added-to-certification/ Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-19-november-2021/	
07-Dec-21 Travel restrictions to delay the importation of Omicron	Travel restrictions	Transport Secretary Michael Matheson	Scottish Government documents: https://www.gov.scot/news/pre-departure-test-requirement-for-travel/	Re-introduction of requirement for pre-departure test - People arriving in Scotland from abroad will need to take pre-departure COVID-19 tests to help stem the spread of the omicron variant. International travellers will have to provide a negative pre-departure test taken two days before travelling, in addition to a negative PCR test on or before day two after arrival, under measures agreed on a four nation basis.
11-Dec-21 Tightening of self-isolation rules (Omicron)	Self-isolation		Scottish Government documents: Coronavirus (COVID-19) update: First Minister's statement – 10 December 2021 Scottish Government Covid-19 Advisory Group: https://www.gov.scot/publications/scottish-government-covid-19-advisory-group-minutes-2-december-2021/	
29-Dec-21 Changes to testing priorities in the light of increasing case numbers	Strategy and capacity		Scottish Government documents: https://www.gov.scot/news/action-to-focus-test-and-protect-on-those-at-highest-risk/	

Key events (with dates)	Topic	Main body/persons involved	Relevant documents	Commentary
03-Jan-22 Mass asymptomatic testing for school pupils and staff	To enable schools to reopen and to limit the spread of Omicron	Education Secretary Shirley-Anne Somerville; Chief Medical Officer Professor Sir Gregor Smith	<p>Scottish Government documents: https://www.gov.scot/news/returning-to-school-safely/</p> <p>SAGE and related papers: SAGE 99 – 16-Dec-21</p> <p>FOI requests: COVID-19 contact tracing and self-isolation procedures for schools: FOI release published 1 Jul 21</p> <p>COVID-19 test and tracing within schools: FOI release published 28 Oct 20</p> <p>COVID-19 Positive cases for students and teachers: FOI release published 13 Jan 21</p> <p>Evidence synthesis: A scoping review of the experience of implementing population testing for SARS-CoV-2 - ScienceDirect</p>	SAGE 99 - Testing before attending any gathering or event (including at workplaces and schools) is highly desirable, with isolation to follow if the test is positive. The negative predictive value of a negative test declines in a matter of hours, so a test should be conducted as close to a meeting or event as possible. Testing after attending a gathering or event is also important, with isolation of positive cases and contact tracing following. Lateral flow devices are helpful at an individual level, but they can also be used at a group level. If there is one positive test within a group (such as a household) there is a significant chance that others are already infected, even if not yet testing positive. If one person from a group tests positive prior to an event or gathering, then none should attend. Ensuring sufficient testing capacity (including maintaining fast turnaround times for results) will be essential if testing measures are to be effective. If testing is not possible, physical distancing, wearing of face-coverings, and environmental interventions may need to increase further to compensate. The same is true if, or when, contact tracing capacity is exceeded.
06-Jan-22 Symptom-free cases can end self-isolation with 2 negative LFD tests; fully	Self-isolation		<p>Scottish Government documents: https://www.gov.scot/news/self-isolation-and-testing-changes/</p>	

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vaccinated close contacts do not need to self-isolate (daily LFD)				

Relevant evidence syntheses

Title of review	Date of publication (or date on document if not published)	Very brief details of what the review covers (review question, not findings)	Link
A rapid systematic review of measures to protect older people in long-term care facilities from COVID-19	18 October 2021	Rapid review examining the impact of mass testing in long-term care facilities on controlling the spread of COVID-19	A rapid systematic review of measures to protect older people in long-term care facilities from COVID-19 BMJ Open
A scoping review of the experience of implementing population testing for SARS-CoV-2	01 September 2021	A scoping review assessing the performance of different testing modalities (eg: drive-through, home visiting, mobile testing, indoor walk-through centres and outdoor walk-through centres)	A scoping review of the experience of implementing population testing for SARS-CoV-2 - ScienceDirect
Accuracy of novel antigen rapid diagnostics for SARS-CoV-2: A living systematic review and meta-analysis	12 August 2021	Systematic review evaluating the utility of rapid antigen tests for early diagnosis of COVID-19.	Accuracy of novel antigen rapid diagnostics for SARS-CoV-2: A living systematic review and meta-analysis - PubMed (nih.gov) Updated link (non-English): Universitätsklinikum Heidelberg: Diagnostics Global Health (uni-heidelberg.de)
Effectiveness of contact tracing apps for SARS-CoV-2: a rapid systematic review	12 July 2021	Rapid review evaluating the effectiveness of digital contact tracing in reducing the spread of SARS-CoV-2	Effectiveness of contact tracing apps for SARS-CoV-2: a rapid systematic review - PubMed (nih.gov)
Rapid Diagnostic Testing for COVID-19 in a fully vaccinated population	18 June 2021	A rapid systematic review on the use and effectiveness of rapid diagnostic testing (RDT) in a fully vaccinated population including what international guidance exists concerning this topic and social and economic considerations surrounding this	Rapid Diagnostic Testing for COVID-19 in a fully vaccinated population (sporevidencealliance.ca)
Public Health and Health Systems Impacts of SARS-CoV-2 Variants of Concern	06 June 2021	Rapid scoping review related to variants of concern, transmission, public health (including	Public Health and Health Systems Impacts of SARS-CoV-2 Variants of Concern (sporevidencealliance.ca)

Title of review	Date of publication (or date on document if not published)	Very brief details of what the review covers (review question, not findings)	Link
		testing, contact tracing and outbreak management), and health systems	
Effective public health measures to mitigate the spread of COVID-19: a systematic review	29 May 2021	Systematic review of epidemiological studies that investigated the effect of the implemented public health measures on the spread of COVID-19	Effective public health measures to mitigate the spread of COVID-19: a systematic review - PubMed (nih.gov)
Rapid, point-of-care antigen and molecular-based tests for diagnosis of SARS-CoV-2 infection	24 March 2021	Systematic review focussing on the performance of different rapid point of care antigen and molecular tests in detecting COVID-19 infection.	Rapid, point-of-care antigen and molecular-based tests for diagnosis of SARS-CoV-2 infection - Dinnes, J - 2021 Cochrane Library
False-negative results of initial RT-PCR assays for COVID-19: A systematic review	10 December 2020	Systematic review providing the pooled estimates of false-positive test results produced by RT-PCR tests.	False-negative results of initial RT-PCR assays for COVID-19: A systematic review - PubMed (nih.gov)
Viral Cultures for Coronavirus Disease 2019 Infectivity Assessment: A Systematic Review	06 December 2020	Systematic review exploring correlation between the PCR results and infectivity	Viral Cultures for Coronavirus Disease 2019 Infectivity Assessment: A Systematic Review - PubMed (nih.gov)
At what times during infection is SARS-CoV-2 detectable and no longer detectable using RT-PCR-based tests? A systematic review of individual participant data	04 November 2020	Systematic review involving individual participant data from longitudinal studies to estimate the percentage of positive test results by time and the duration of detectable virus, by anatomical sampling sites.	At what times during infection is SARS-CoV-2 detectable and no longer detectable using RT-PCR-based tests? A systematic review of individual participant data - PubMed (nih.gov)
Universal screening for SARS-CoV-2 infection: a rapid review	15 September 2020	A rapid review assessing the effectiveness of universal screening for SARS-CoV-2 infection compared with no screening and accuracy of universal screening in people who have not presented to clinical care	Universal screening for SARS-CoV-2 infection: a rapid review - Viswanathan, M - 2020 Cochrane Library

Title of review	Date of publication (or date on document if not published)	Very brief details of what the review covers (review question, not findings)	Link
		for symptoms of COVID-19 (also includes testing at travel hubs).	
Digital contact tracing technologies in epidemics: a rapid review	18 August 2020	Rapid review on the effectiveness of digital contact tracing systems in real-world outbreak settings.	Digital contact tracing technologies in epidemics: a rapid review - Anglemeyer, A - 2020 Cochrane Library
Coronavirus disease (COVID-19) Community Testing Team in Scotland: A 14-day review, 6 to 20 February 2020	26 March 2020	A study from Scotland that set up a team and piloting a sampling system for testing for COVID-19	Coronavirus disease (COVID-19) Community Testing Team in Scotland: A 14-day review, 6 to 20 February 2020 (nih.gov)