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COVID-19

Scotland's Testing Strategy Update



March 2021

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Scotland's overall current pandemic strategy is set out in *Coronavirus (COVID-19) Scotland's Strategic Framework Updated*, published on 23 February 2021. That strategy remains to suppress the virus – driving the number of cases to the lowest possible level – to support the resumption of life as close to normal as possible.

Scotland's COVID-19 Testing Strategy contributes to this overall pandemic strategic intent. It is one of six main tools described in the *Strategic Framework* alongside: vaccination; protective measures including non-pharmaceutical interventions like physical distancing and face coverings; border control measures (which also include testing); adherence support measures (including support for self-isolation); and wider care and support to mitigate the harms caused by the pandemic.

The *Strategic Framework* stresses two key points: that the overall goal remains suppressing the virus to as close to elimination as possible, as that remains the best way to minimise all the harms caused; and that, given the nature of the virus, we are likely to ultimately have to live with COVID as a permanent feature of our lives.

The implications of this for testing are twofold: first; that as we work to suppress the virus to as close to elimination as possible, and keep it there, we will actively seek out every possible case using all of our now advanced testing capabilities to

their optimal potential; and second; that testing for COVID-19 is likely to become a permanent feature in our lives – though one whose form will continue to change and adapt as the pandemic, and the virus itself, does.

In addition, given the strategic intent is to support the resumption of life as close to normal as possible, testing will increasingly play a role in supporting wider social and economic goals, by further reducing transmission risks through active case finding as we return to variable levels of restrictions across Scotland.

It remains critical to repeat the emphasis of the original Testing Strategy that testing, on its own, does not stop the virus spreading; it only provides information that can support us to take action to stop transmission. It is one of many interventions that will continue to be necessary in various forms for a considerable period of time. Ensuring there is sufficient support for isolation – and that those who require this support know it is there and can easily access it – is critical in creating the conditions that actually stop the onward spread of the virus.

And, as has been the case since the beginning of the pandemic, our overall testing strategy will continue to adapt to both the pandemic conditions facing us, and the technology and capability at our disposal.

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It remains critical that people and communities continue to engage with testing as welcome progress is made in the vaccination programme. Isolating and booking a test as soon as symptoms develop, or engaging with routine testing programmes where they are established, or engaging in targeted community testing and isolating if positive, will all continue to play a critical role in supporting our overall aim of suppressing the virus to the lowest levels possible.

We will also deliberately build on the significant diagnostics infrastructure now developed in Scotland and invest further in specific testing capabilities – for instance, whole genome sequencing – in order to intentionally build a legacy from this experience that will leave Scotland in a better position to deal with a range of other infectious disease challenges and future health threats, including future pandemics.

Scotland's Testing Strategy as published on 17 August 2020 set out a group of principles that continue to guide our approach to testing. They are set out again below.

Testing Strategy – Principles

1. Testing is part of our overall public health approach designed to minimise transmission of the virus, in line with our overall strategy of driving the number of cases of COVID-19 in Scotland to the lowest levels possible and maintaining that level.
2. Our priorities for testing are informed by scientific, clinical and public health advice from our expert advisory structures. All people moving to care homes from hospital or the community are also tested prior to admission.
3. Our approach to testing, including prioritisation, is flexible and adaptable to the prevailing conditions of the pandemic at any time, and informed by expert advice.
4. Our approach to testing takes full recognition of the limitations of testing (particularly at low levels of disease prevalence) as well as the opportunities of testing.
5. Our overall priority at this stage of the management of the disease is rapid identification and testing of people with symptoms.
6. Asymptomatic testing will increasingly be used on a risk-based approach to both minimise transmission through active case finding and to reduce harm to individuals at high risk.

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7. The deliverability of any new testing priorities and pathways will be considered at an early stage to maximise successful implementation.

8. The capacity to accurately and efficiently record, report, interpret and respond to every test in a timely manner is critical.

9. Our approach to testing will aim to continually improve access to testing – both the ease with which people can access a test (or routine testing if appropriate), and the speed with which they obtain results.

These principles were reviewed as part of the *Clinical and Scientific Review of the Testing Strategy*, published on 23 October 2020. The importance of access to testing was stressed in that review, with the ninth principle added to reflect this.

The rest of this update is structured to mirror the original strategy. Section 2 updates *why* we test – outlining six purposes for testing at an individual, community and population level. Section 3 updates *how* we test – including new capacity that enables more widespread rapid testing and crucial new technology in surveillance that the Scottish Government is investing in to ensure we are in the best position possible for the critical next phase of the pandemic where the risk is of new variants undermining progress. Section 4 updates *who* we test – outlining the significant expansion in routine testing since the October review of the strategy, and looking ahead to the next phases as Scotland exits lockdown.

2. Why we test: six purposes

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Testing Strategic Intent

Given the current state of the epidemic in Scotland, our overall strategic intent in the updated *Strategic Framework*, and the technology and capacity now available, our overall strategic purpose for testing is to:

make optimal use of Scotland's testing capacity to suppress the virus to the lowest possible level and keep it there, while supporting the return to as normal a life as possible, mitigating the four harms caused by the crisis, and building a legacy of improved resilience and preparedness for current and future health threats.

Within this overall strategic purpose, there are six rationales for testing at an individual, community and population level, set out below.

Rationales for Testing

The original Testing Strategy set out five reasons for our priorities for testing for COVID-19 in Scotland: testing to diagnose anyone with symptoms of COVID-19; testing for clinical care of patients; testing to protect those vulnerable to the most harm from COVID-19; testing to proactively case find among people without symptoms, and testing for surveillance to monitor prevalence and understand disease transmission.

The clinical and scientific review published in October set out the consensus view of our senior advisers that testing anyone with symptoms and testing for clinical care are the overarching priorities for the Testing Programme. Testing for these purposes – and testing for ongoing surveillance – will likely remain core elements of Scotland's continuing COVID-19 testing infrastructure on a permanent basis as COVID-19 moves from a pandemic phase to endemic.

In addition, the most recent expansion of routine testing announced on 2 February extends testing for a sixth purpose: to support the maintenance of essential services and mitigate wider social and economic harms. Testing to support our strategic intent to support the resumption of life as close to normal as possible is likely to grow in significance as we move through the phases outlined in the updated *Strategic Framework*.

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These six rationales for testing can therefore be summarised as:

1. Test to Diagnose all those with symptoms of COVID-19 to enable rapid isolation of confirmed positive cases and contact tracing of their close contacts who may be potentially infectious, to advise them to isolate, thereby stopping onward spread of the virus infecting other people.

2. Test to Care for those receiving clinical care in hospital and those admitted to hospital on a planned or emergency basis to both support optimal patient care and the selection of appropriate care pathways, and to reduce the risk of hospital-based outbreaks. All people moving to care homes from hospital or the community are also tested prior to admission.

3. Test to Protect those most vulnerable to severe harm through routine testing, for example, staff in healthcare and social care settings including hospitals, primary care workplaces, and adult care homes, so that those who test positive can isolate and avoid risking transmitting to those most vulnerable.

4. Test to Find and interrupt chains of transmission through Targeted Community Testing and testing all close contacts of positive cases.

5. Test to Support the resilience of essential services and mitigate the wider social and economic harms caused by the pandemic. This includes routine testing to support the safe return to school, in higher and further education environments, and extending an offer of routine testing to businesses in food production and distribution.

6. Test to Monitor the prevalence of the disease at a population level, detect early signals of new incidence, detect new variants of concern, and understand transmission dynamics (including the impact of vaccination on transmission) in key sectors.

Figure 1 below illustrates these six purposes of testing and their relative contribution to mitigating the four harms caused by the virus. The six purposes of testing are not mutually exclusive, and where there are instances where testing a particular group on a regular basis contributes to multiple purposes, then the overall case for prioritisation of that particular testing may be strengthened.



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Context – A Range of Rechnologies for a Range of Purposes

Scotland’s testing strategy has deliberately developed and used a range of testing technologies in complementary ways to meet the overall strategic purpose for testing of contributing to suppressing the virus to the lowest possible levels, while mitigating wider harms. Each of these technologies has inherent attributes; advantages and disadvantages which inform the most appropriate deployment under the overarching strategy.

These varying attributes include:

- how sensitive the test is – the proportion of true positive cases identified;
- how specific the test is – the proportion of true negative cases identified;
- the speed of result;
- logistics required, including laboratory infrastructure and workforce;
- whether the test is designed to diagnose active infection or evidence of prior infection;
- the test’s suitability for whole population surveillance and monitoring;

- the test’s ability to detect new variants of COVID-19, including those which may be problematic at this stage of the pandemic due to selective advantages such as increased transmissibility, increased severity, or reduction of pre-existing immune response and/or vaccine effectiveness.

The range of technologies available has increased since the last review of the strategy in October, with rapid antigen tests (Lateral Flow Devices or LFD) now enabling larger-scale routine testing, and targeted community testing, including the provision of asymptomatic testing at community level.

PCR (Polymerase Chain Reaction) testing remains the core technology for symptomatic testing. Since the October review, there have been three main focuses of development for PCR testing: increasing laboratory capacity; improving turnaround times; and increasing population access to sampling provision.

Also core has been balancing the relative contribution of the UK Government Testing Programme and NHS Scotland laboratories to PCR processing capacity. The remainder of this section sets out developments in capacity; access; and investments to secure a lasting legacy of improved preparedness for future health threats.

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Capacity

The October review of the Testing Strategy set out the Scottish Government aim to increase overall PCR processing capacity to 65,000 tests per day by winter 2020. This was achieved through a combination of increased capacity via the UK Government Lighthouse network, and the building of three new NHS Scotland Regional Laboratories, with a combined capacity of 22,000 tests per day.

This has meant that testing capacity has been sufficient to meet symptomatic demand over the whole of autumn and winter in Scotland. Turnaround times have also improved across all testing routes. In the most recent weeks, turnaround times have remained consistently below 24 hours across all regional test sites, Local Test Sites (walk-through sites) and Mobile Test Units. Turnaround times for NHS Scotland laboratories and Regional Hubs are also within 24 hours for the vast majority of cases.

Over the next period, our aim is to maintain this performance in turnaround times by ensuring capacity across the network can remain within a daily operational maximum limit of approximately 70%. This is to ensure our symptomatic PCR testing has the maximum possible public health impact in terms of rapidly isolating positive cases, and ensuring their contacts can be traced as quickly as possible to enable them to isolate and prevent onward transmission.

Figures published by Public Health Scotland show the overall Test and Protect system performs well in terms of timeliness of intervention to support the public health intention of isolating potentially infectious contacts to prevent further transmission. The WHO criteria for effective performance of a contact tracing system for COVID-19 is that at least 80% of new cases have their close contacts traced and in quarantine within 72 hours of case confirmation.

The closest proxy to this in Scotland measures the time between a confirmed positive case being entered into the Test and Protect Contact Management System and the completion of the final close contact interview, advising the contact to self-isolate. In the reporting week 01 to 07 March 2021, statistics show that 98.3% of the contact tracing for all positive cases was completed within 72 hours and 93.9% completed within 48 hours. Since its launch the Test and Protect system has consistently performed strongly in terms of timeliness, including during the sustained increase in cases during autumn and winter 2020.

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Point-of-Care testing capacity has also increased over this period, through deployment of Lumira DX and other point-of-care testing in hospital settings. NHS Scotland now has capacity of 3,000 point-of-care tests per day, which are supporting the testing of patients on admission to hospital. The faster turnaround times of point-of-care tests compared to PCR has supported better patient flow in emergency departments over the particularly pressured winter months.

The most significant change to capacity of new technology available has been the increase across the UK in LFD capacity since the end of 2020. Significant volumes of LFD devices have been procured under the UK National Testing Programme, with all four nations now having LFD capacity sufficient to expand routine asymptomatic and targeted community testing.

Finally, Scotland has invested in newer technologies to support surveillance testing, including wastewater testing and surveillance of variants of concern through whole genome sequencing. These developments are set out in the legacy section below.

Access

Daily case numbers through the testing system are published each day on the [Scottish Government website](#) and form a key ongoing indicator of national and local incidence of COVID-19. We know, though, that not everyone with COVID-19 displays symptoms, and not all who have symptoms are tested. So the daily case numbers consistently represent a significant underestimate of the actual number of daily new infections in Scotland.

Given our overall strategic intent of suppressing the virus to as close to elimination as possible, our aim in our testing strategy is make sure population access to symptomatic PCR testing is as comprehensive and accessible as possible (an updated Equalities Impact Assessment on Test and Protect is published alongside this Strategy Update).

In addition to national accessible provision of PCR testing for symptomatic people, we have further developed a comprehensive programme of local targeted community testing – both symptomatic and asymptomatic – where prevalence is stubbornly high, or where communities have specific transmission risks they wish to address.

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Improving Access to Symptomatic Testing

Our approach to improving access to symptomatic testing is to consider the full range of sampling routes available, engage with local partners to deploy all sampling channels holistically and flexibly to best reflect population need, and innovate where necessary; for example, to extend accessibility in more remote communities through small-scale test sites in rural areas of NHS Highland in partnership with the Scottish Fire and Rescue Service.

Our symptomatic testing expansion will increase the proportion of the population within a thirty-minute drive of testing to beyond 95% of the population. We are also supporting access to testing for those without cars and in areas of higher deprivation, and we will double the proportion of the population within walking distance of walk-through local test sites to 36% – meaning an increase from 1 million people within walking distance of a Local Test Site to 2 million people.

Scotland currently has 34 walk-through local test sites, 8 drive-through regional test sites, 21 small-scale or pick-up test sites in NHS Highland, and 42 mobile testing units, roughly half of which are deployed to do symptomatic testing. We have also worked with the UK Government and the Royal Mail to expand home test kit coverage to all of mainland Scotland.

Targeted Community Testing

In addition to addressing key barriers to accessing testing through our expansion of symptomatic test sites, we have continued to develop a national Targeted Community Testing programme which supports both symptomatic and asymptomatic testing. We have piloted innovative ways to engage with local communities and groups such as the set-up of testing sites in local community halls and places of worship.

Scotland piloted Community Testing in December 2020. This included both the deployment of mobile units to boost symptomatic and asymptomatic whole community testing at early signs of rising prevalence, and the operation of fully Asymptomatic Test Sites using LFDs.

During the pilot, 22,133 tests were carried out with 850 positive cases found.

Since these pilots, we have worked closely with local partners and now have developed a comprehensive programme of locally led targeted community testing, with wrap-around support for isolation built in; supported by regular ongoing intelligence and data from a variety of sources.

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This has involved the allocation of over £5 million in additional funding this financial year to NHS Ayrshire & Arran, Borders, Dumfries & Galloway, Fife, Greater Glasgow & Clyde, Grampian, Lanarkshire and Forth Valley, and the 20 local authority areas they cover. Discussions are underway with the remaining health board areas and their local authorities with the aim of agreeing community testing proposals in the coming weeks. This includes discussions with island authorities where there may be specific transmission risks that island communities would wish to address using targeted community testing.

Targeted Community Testing is being delivered through an expanded Mobile Testing Unit fleet and the deployment of community Asymptomatic Testing Sites. As of 15 March, 27 sites were operating across Scotland.

Working in partnership with territorial health boards and local authorities to target testing through this programme has, up to 15 March, identified over 1,700 positive cases that may otherwise have been missed, breaking chains of transmission in those communities. 351 of these came from asymptomatic individuals who might otherwise have risked transmitting to transmit COVID-19 to their family, friends or colleagues.

The ability to identify and effectively respond to community transmission will become even more important as we start to relax restrictions. Therefore, we intend to write to all territorial health boards and local authorities shortly with a view to agreeing the additional funding needed to continue this programme into 2021-22.

Surveillance Testing – adapting to the next phase and building a world-class public health legacy

Scotland already has comprehensive surveillance testing in place both at a population level through the Office for National Statistics (ONS) Coronavirus (COVID-19) Infection Survey, and in key sectors such as schools in partnership with Public Health Scotland, and healthcare settings in partnership with NHS Boards.

This surveillance testing uses PCR testing to identify current infection and antibody testing to detect evidence of prior infection, and provide estimates of the proportion of the population, or certain workforces, who may have developed some degree of natural immunity.

The ONS COVID-19 Infection Survey uses PCR testing to estimate the number and proportion of people in Scotland that would have tested positive for the COVID-19 in the community, regardless of whether they report symptoms. The study also estimates the number and proportion of people

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aged 16 and over who would have tested positive for COVID-19 antibodies from a blood sample, suggesting they had the infection in the past or have been vaccinated.

The study will play a key role in monitoring antibodies in the community population in Scotland which will help to indicate the extent to which the vaccination programme is building resistance to COVID-19 as its roll-out continues. ONS is currently considering plans for widening antibody testing to monitor vaccine effectiveness, and it is likely that testing to monitor will grow in importance as we move to future phases where more of the population are vaccinated.

Wastewater Testing

Wastewater testing offers the potential to monitor prevalence and detect outbreaks of SARS-CoV-2. The Scottish Environment Protection Agency (SEPA), working in conjunction with Scottish Water and Public Health Scotland, has formed a monitoring network across Scotland for the purpose of analysing wastewater samples to determine the level of COVID-19 infection markers present. As of 2 February 2021, the monitoring network encompasses 70 sites covering 3.5 million people. Samples from these locations are tested at least weekly, which can be increased when local outbreaks are apparent.

Further to Scottish Government funding of £1.1 million in December 2020, SEPA has significantly expanded its lab capacity to support the programme with capacity now for 200 samples per week. This has allowed for the continuation of national monitoring at wastewater treatment works, and has also enabled wastewater sampling to begin at local sites within the Scottish Water network. This data is contributing to our knowledge of prevalence across Scotland, thereby aiding the direction of Community Testing resources, with national mobile resources able to be deployed where there is evidence that prevalence is rising.

The wastewater monitoring approach is a reliable indicator of low viral prevalence and a good early or lead indicator or signal of virus detection. It provides a complementary, unbiased data stream to prevalence detected from human testing, and is flexible in scale, with it possible, for example, to sample an entire city or just one building.

Importantly for the challenges likely to be posed in the next phases of the pandemic in Scotland, it is also possible to detect viral mutations by sequencing wastewater samples.

Wastewater testing can also be used to monitor other viruses and markers of public health, and so represents a significant post-COVID legacy benefit. These broader and longer-term use cases could include the monitoring of other viruses, such

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as influenza, rotavirus, norovirus, enterovirus, and the monitoring of antibiotic-resistance in bacterial pathogens. To this end, we are investing £2.3 million in the further development of Scotland’s wastewater testing capability in 2021-22.

Whole Genome Sequencing

The next phases of the pandemic in Scotland will have two critical challenges – effectively and promptly stopping outbreaks before they build to sustained community transmission, and managing the risk of new strains of the virus emerging either from imports or from mutations occurring within Scotland. These risk our considerable progress in reducing prevalence levels.

Whole genome sequencing is critical to all of these challenges. In outbreak management, sequencing can support analysis of whether an outbreak has its roots in single or multiple introductions. In managing import risk, sequencing of all positive cases found in our quarantine testing is supporting the detection of new variants of concern. Similarly, moving towards sequencing all identified positive cases within Scotland will allow detection of ‘home-grown’ mutations.

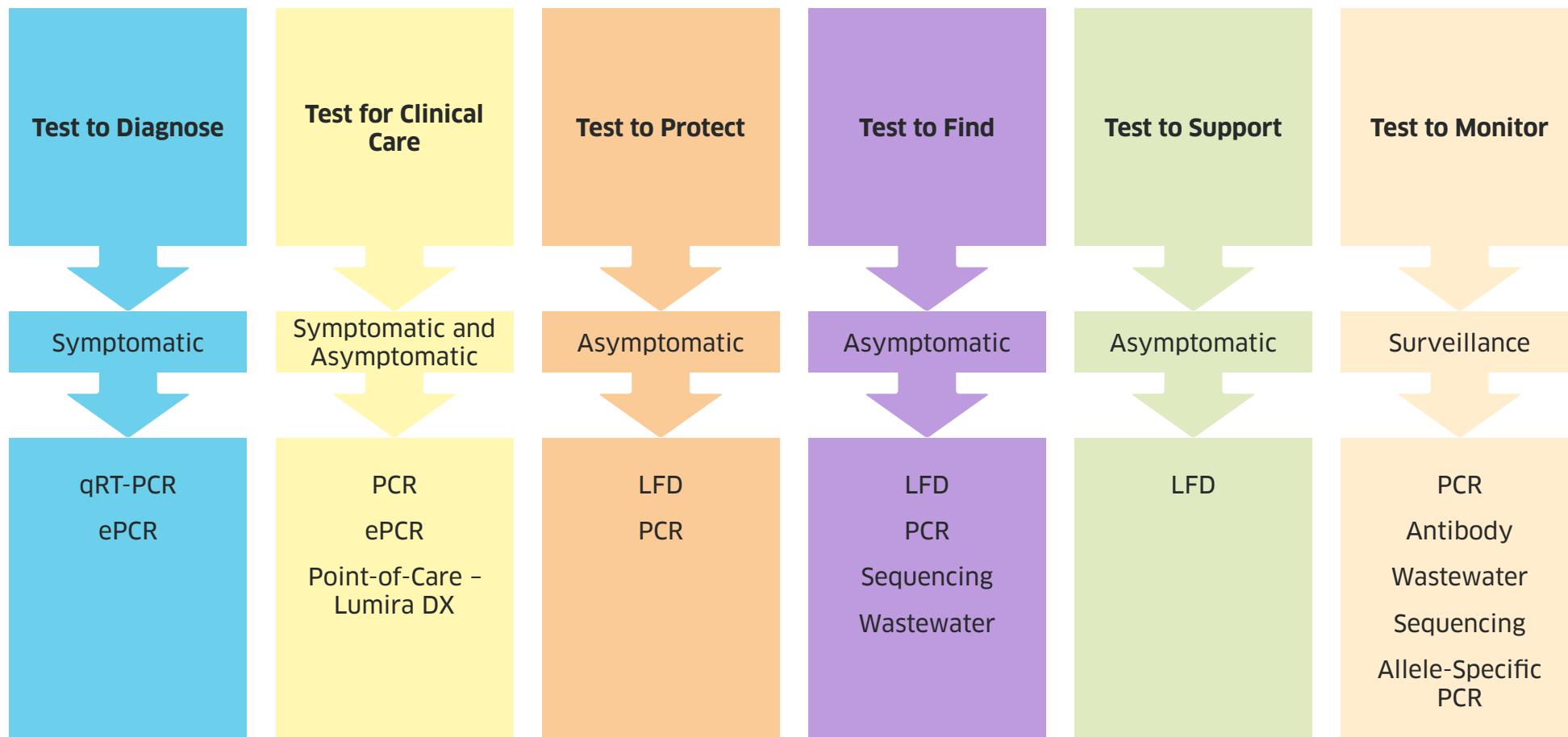
The increase in sequencing capacity will be complemented by the development of allele-specific PCR tests. These are high throughput tests which can be used for rapid screening of known mutations within a variant of concern,

which will facilitate early public health assessment and more rapid interventions to minimise spread in the community. Optimal service delivery options are currently being evaluated.

While this allele-specific PCR testing is suitable for rapid follow-up PCR testing for known variants of concern (once developed), it is not capable of detecting yet to be identified mutations or new variants of concern VOCs. Therefore for comprehensive surveillance to detect the emergence of VOC, both allele-specific PCR testing and Whole Genome Sequencing will be required.

Building on the experience and expertise of our world-class scientists, we expect to invest a further £13 million in 2021-22 to build a Whole Genome Sequencing Service for Scotland. This will both support our ability to maintain progress in the coming months – by better managing outbreaks and detecting imported variants of concern – and build a legacy of a genuine world-class public health system, better prepared in the event of any future pandemic. It will be capable of sequencing up to a thousand cases per day when fully built, and support not just protecting our progress against COVID, but our resilience to a range of threats, including antibiotic resistance. Our ambition is to be able to sequence all positive cases found in Scotland; and to build a legacy that can contribute globally as well as in Scotland.

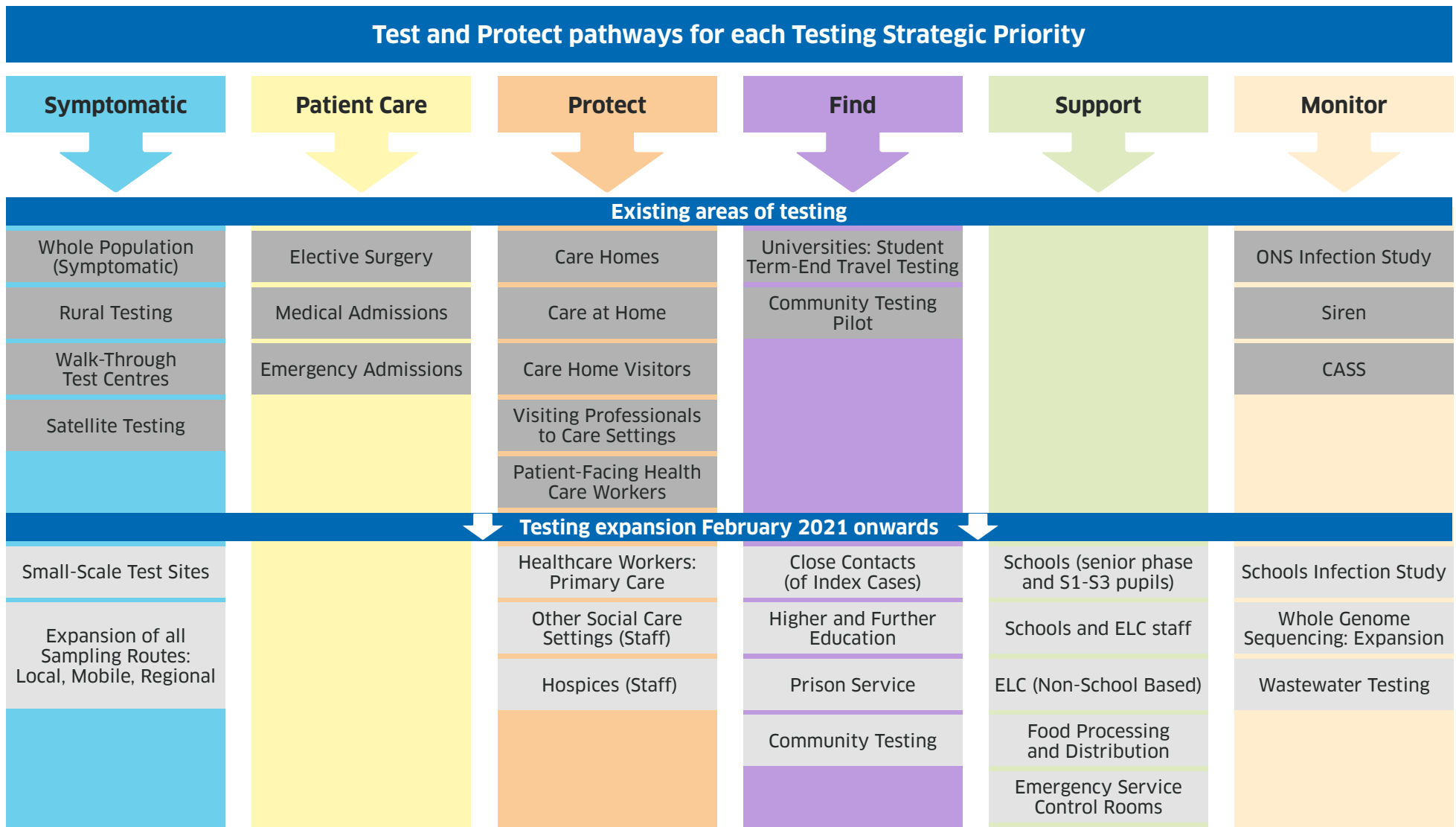
How we test - Technology informed by testing strategy



KEY:

- PCR - Polymerase Chain Reaction Testing
- LFD - Lateral Flow Device
- ePCR - endpoint PCR testing
- Point-of-Care testing - near-patient test
- Allele-Specific PCR - amplifies specific genetic variants - can be used to detect VoC

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Test to Diagnose

Under Test to Diagnose, anyone with one or more of the three core symptoms in the case definition – fever, new persistent cough, and loss of taste or smell – is encouraged to self-isolate to book a test as quickly as possible. We recognise a wide range of other symptoms has been identified as potentially indicative of COVID-19. From end of March, where GPs have a clinical concern that a patient without any of the three core symptoms may have COVID-19, they can advise that patient to book a PCR test through the usual booking portal.

Test to Care

Under Test to Care, anyone in hospital who develops symptoms of COVID-19 is tested promptly to ensure both optimal clinical care for them, and appropriate cohorting to minimise risk of in-hospital transmission either to staff or other patients. In addition, all emergency admissions are tested. All people undergoing planned admission to hospital are given a PCR test 72 hours before admission via NHS Scotland testing routes, and are only subsequently admitted when a negative test result has been confirmed. All new care home residents, whether from the community or hospital, are tested prior to admission. COVID recovered patients in hospital require two negative tests prior to discharge to a care home.

Test to Protect

Under Test to Protect, all patient-facing healthcare workers, alongside Scottish Ambulance Service and NHS24 call handlers, test twice weekly using LFDs. Since roll-out commenced in November 2020, Public Health Scotland has reported that over 778,000 tests have been self-reported by in-scope healthcare workers (cumulative as at 15 March 2021). Of those reported, there have been over a thousand asymptomatic positive test results identified.

As we continue to expand our testing capacity, we are finding more asymptomatic cases amongst healthcare workers resulting in an increase in positive cases. However, by identifying asymptomatic but positive members of staff as early as possible enables them to leave the workplace and self-isolate immediately, in line with national guidance, thereby breaking chains of transmission.

Alongside robust infection prevention and control (IPC) measures in hospital and other care settings (including the appropriate use of PPE, extended use of face masks and coverings, physical distancing and outbreak management), the addition of asymptomatic staff testing has helped support a reduction in hospital-onset COVID-19 cases since January 2021.

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Roll-out of twice-weekly lateral flow testing to all patient-facing primary care healthcare workers started on 15 February 2021, meaning approximately 58,000 staff across patient-facing teams in general practice, dentistry, optometry and pharmacy, across communities, have access to twice-weekly lateral flow testing. All hospice staff are also eligible for twice-weekly testing.

In adult social care, all care home staff receive twice weekly testing; all visiting professionals to care homes receive routine testing; and family and friend visitors to care home residents are tested on the day of the visit as an additional layer of protection.

Care at home staff began routine testing for adult services from the 18 January (adult day centres/ day services, care at home, personal assistants, and sheltered housing/housing with multiple occupancy). This was implemented by the end of February – one month ahead of the planned full roll out date.

Across all these social care groups – visiting professionals, care at home staff, family and friend visitors, and care home staff – Public Health Scotland figures to date have reported over 500 asymptomatic positive results.

Expanded testing for social care staff groups began on 8 March (for children’s and young people’s personal assistants and care inspectors visiting children and young people services). Further testing for staff will be phased from March for the following people working in care roles: children’s care homes, children and young people community services, addiction, homelessness, mental health, learning disability, women’s aid shelters and social workers not yet covered by testing. Work will also commence to examine non-registered services that provide support to vulnerable groups.

Test to Find

Since 18 February, all close contacts of index cases have been advised to book a PCR test between day 3-5 from exposure to a confirmed positive case. Testing is not an alternative to isolation and individuals who test negative are still required to complete the 10-day self-isolation period. Testing close contacts will allow cases that might otherwise have gone undetected to be identified and further chains of transmission to be broken by identifying and isolating potentially infected contacts. It will also provide further intelligence to public health teams about secondary attack rates (the probability of infection occurring among close contacts of confirmed cases) and high-risk settings, by highlighting where there may be a higher risk of transmission to contacts.

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At a community level, Test to Find is a core part of the rationale for Targeted Community Testing, with proposals developed with local partners to address problems of stubbornly high transmission, or rapidly rising transmission, or specific transmission risks in local communities. Proposals for Targeted Community Testing have now been agreed with 25 local authorities across 10 Health Board areas.

We will introduce testing of staff working in prisons to reduce the risk of asymptomatic prison staff importing COVID-19 into the prison environment. We will start with three prisons to assess the operational feasibility and public health impact of this type of testing. Subject to a successful initial phase, we will expand testing to further prisons in due course.

We will also build on our existing programme of offering testing to students at times of large population movement (before and after the end of the first semester), to include extending access to PCR testing to students close to their non-term-time address prior to travelling to accommodation at university or college. Plans are also being developed to roll out regular (twice-weekly) testing for university and college students and staff.

Quarantine testing was introduced with the new Managed Isolation policy for international arrivals to Scotland from outside the Common Travel Area from 15 February. All arrivals are tested twice during their quarantine period – on day two and day eight of the ten-day quarantine. All day two positive test results are sent for sequencing in order to detect any possible variants of concern.

Test to Find has also been a core part of outbreak management since the beginning of the pandemic, with mobile units deployed on the request of outbreak Incident Management Teams or Directors of Public Health to enable the testing of whole workplaces, or communities, or other locations of outbreaks. This testing continues on a case-by-case basis. Through our Community Testing programme, we have worked with the Scottish Ambulance Service, which operates the Mobile Testing Fleet in Scotland, to expand the potential of the current mobile fleet (42 vehicles) through a flexible staffing model that enables up to 84 communities to be served by the fleet, for sustained targeted community testing or for outbreaks.

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Test to Support

Regular asymptomatic testing is now also available at certain food production and food distribution businesses, including places like dairies, abattoirs and meat and seafood processing plants.

These are settings that present a higher risk of transmission due to factors like low temperatures, high humidity and limited ventilation. Under the scheme, which is voluntary for businesses and staff, eligible businesses are provided with free LFDs. Any positive tests are then confirmed by a PCR test. By taking part in this scheme, food businesses are helping to support their workers and to prevent outbreaks and minimise the risk of closure. They are also helping to minimise the risk of any cases or outbreaks in their premises spreading into the wider community. Businesses that are interested in participating are invited to contact FoodSupplyInformation@gov.scot.

Under the Schools/ELC Asymptomatic Testing Programme, twice-weekly at-home testing using LFDs is being made available to all staff in primary, secondary and special schools, and all secondary school pupils (with the S1-S3 cohort due to be included in the testing offer as part of an expected fuller return after the Easter break, which will be subject to continued progress in suppressing the virus). Staff in school-based early learning and school-age childcare settings will also receive testing as part of this phase of the programme.

The goal of this testing is to identify staff or young people who have the virus but do not have symptoms and require them to self-isolate, thus breaking potential chains of transmission early and minimising the risks of outbreaks in schools. Test kits are being supplied to all schools in Scotland for onwards distribution to those who wish to take part in the programme. Participants will then test at home and record results using a digital portal (or by telephone if they prefer). Anyone testing positive should self-isolate according to guidelines, and ensure they take a confirmatory PCR test to minimise the risks of false positives.

Phase two of the Schools/ELC Asymptomatic Testing Programme will see all standalone day care of children settings, providing early learning and school age childcare services, receive the same offer of twice-weekly lateral flow testing at home to break potential chains of transmission early and minimise the risks of outbreaks in settings. Preparation for this expansion is underway and test kits are expected to be available for staff through settings by the end of March.

To support the safe running of essential services, routine asymptomatic testing has commenced in the control rooms of Scottish Ambulance Service, Police Scotland and Scottish Fire and Rescue Service as well as NHS24 call centres.

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Previous iterations of the testing strategy have made it clear that we are taking a risk-based approach to testing in workplaces. We believe that this is the most effective use of testing capacity and will ultimately allow us to open the economy in a more sustained way. We will continue to identify sectors which would benefit from asymptomatic testing based on the intelligence on risk and challenges around other mitigations.

Alongside this we will ensure that our community-based testing is engaging effectively with local businesses and workplaces. We will work with local health partners to ensure that appropriate local businesses within high prevalence areas are fully included in community testing programmes, providing a coherent and targeted approach where prevalence of the virus is high. We will continue to engage with business organisations and sector bodies on our testing regime.

Test to Monitor

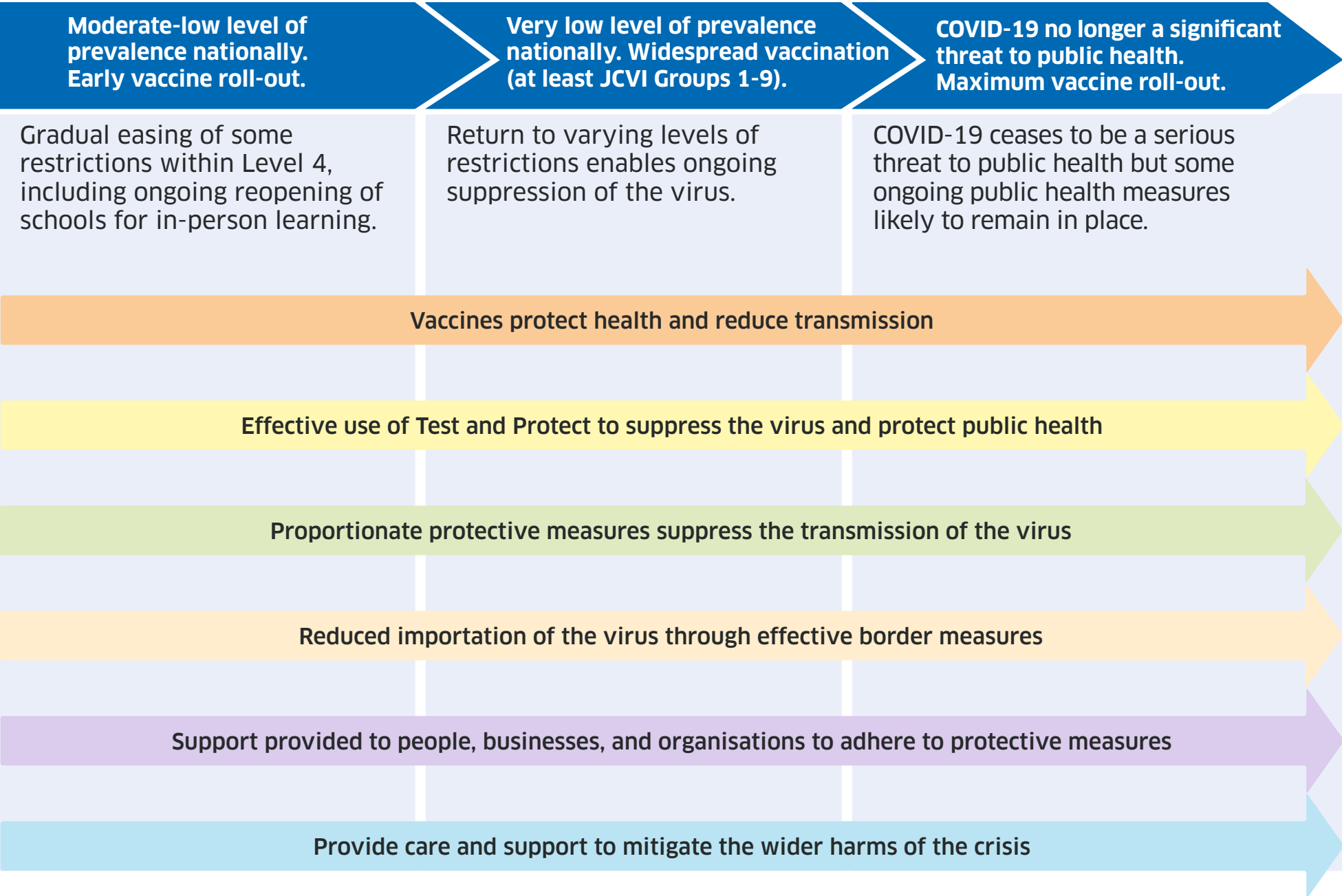
Scotland continues to invest in surveillance testing to monitor prevalence of the virus at a whole population level and in particular workforces including health and education. Our approach to Test to Monitor – using population studies, wastewater testing and whole genome sequencing – is set out in Section 3: How we test.

Three Phases of Strategic Framework

The updated *Strategic Framework* presents three phases as we exit lockdown, linked to levels of prevalence and progress with the vaccination programme:

1. Moderate-low level of prevalence nationally. Early vaccine roll-out.
2. Very low level of prevalence nationally. Widespread vaccination (Joint Committee on Vaccination and Immunisation Group 1-9).
3. COVID no longer a significant threat to public health. Maximum vaccine roll-out.

The role of testing and the relative importance of the six purposes for testing will adapt as we go through these phases.



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Phase 1 – Moderate prevalence nationally

In the first phase, gradual easings of restrictions within Level 4 are taking place, when data indicates it is safe to proceed. These gradual changes are conditional on meeting the WHO six conditions for easing restrictions. The earliest changes began on 22 February, and included the opening of early learning and childcare and schools for years Primary 1 to Primary 3, and a very limited number of senior phase pupils attending secondary schools; and the opening of care homes to visitors to enable meaningful contact between residents and family and friends.

Further gradual easings are proposed, subject to continued evidence of sustained progress in reducing transmission, including the return of more children and young people to schools and the phased return of a small number of university students for in-person learning.

The role of testing in this phase is to support these individual settings as they return, in particular in education, to find cases and mitigate the potential for this return to increase transmission (Rt). The schools testing programme and the extension of higher and further education testing to enable routine testing for on campus students and staff, and the testing of family and friend visitors to care home residents, are all testing that is in place to support this return.

Another key role for testing in this first phase is in mitigating the risk of import. Imperative in this first phase to enable progress to the next phase of a return to a levels approach, is maintaining and building on the continuing progress we are making in reducing prevalence and harm, through our vaccinations programme and through our range of protective measures including testing, contact tracing and supporting isolation. To do this, we will maintain our vigilance to reduce the risk of importation of the virus, and identify and isolate any new variants of concern imported.

Since 18 January 2021, passengers have been under a legal obligation to get a COVID-19 test before they travel. We will continue to make it a requirement for passengers travelling to Scotland from outside the Common Travel Area to be able to certify they have a valid negative test result from the three-day period before travel.

We will continue to make it a requirement for all direct international arrivals to Scotland from outside the CTA, or those arriving from Ireland if they have passed through a red list country in the last ten days, to quarantine in managed isolation facilities and be tested on day two and day eight of their quarantine. In addition, those arriving from within the CTA who have travelled through a non-acute risk country in the ten days before arrival in Scotland must take tests on day two and day eight of their self-isolation-at-home period.

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Phase 2 – Return to levels

Subject to passing a gateway condition of all JCVI priority groups 1-9 being offered at least their first vaccine dose, and evidence of all six WHO criteria for easing restrictions being met, Scotland will return to geographically variable levels of restrictions, based on prevalence, in phase two. This will enable the graduated opening up of social and economic activity at a pace that is safe given epidemiological conditions.

Testing for all six purposes will continue to play a critical role in this phase. This phase is likely to be characterised by a move from sustained community transmission to a pandemic phase characterised more by individual outbreaks, in particular in those settings where we have experienced outbreaks to date and which have not necessarily had the additional protective effect of the vaccination programme. This includes some workplaces where work cannot be done from home and certain closed settings.

In particular, test to Find will continue to be key to active case finding asymptomatic cases in workplaces to enable asymptomatic positive cases to isolate and not attend work, mitigating the risk of an outbreak beginning, or minimising the size of potential outbreaks.

As contacts increase, as schools return and economic and social activity opens up, we expect the number of close contacts of index cases to increase and close contact testing to be key in find cases amongst those known to have been exposed to the virus and therefore potentially infectious.

An increase in contacts and a return to a phase characterised more by outbreaks than by high levels of sustained community transmission will also require continued emphasis on Test to Support the resilience of essential services. We will continue to consider cases for extending routine testing to support this resilience, subject to available capacity.

Given this phase involves a return to geographically variable levels, the role of the Targeted Community Testing programme will grow in importance through supporting rapid and flexible deployment of additional testing capacity at the earliest signal of rising incidence (for example, through the expanded wastewater testing programme) and also asymptomatic testing capabilities to support local areas to target testing programmes in workplaces or other contexts where they have known concerns.

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There are also a number of significant events potentially on the horizon as we move through 2021. These include May's Scottish Parliamentary Election, summer sporting and cultural events if conditions allow, students returning in September, and the COP26 climate summit in Glasgow in November. Where testing can play a role in supporting the safer operation of some of these events as an additional measure, we will learn from existing pilot activity across the UK related to events and use Scotland's testing to support these events in appropriate ways.

Phase 3 – COVID-19 no longer a significant threat to public health

On maximum roll-out of the vaccination programme, and maximum suppression of the virus to the lowest possible level, there is likely to come a phase when COVID-19 is no longer a significant threat to public health, and we learn to live with COVID-19 as a permanent feature of our lives. Public health measures will be ongoing in this phase, including testing to diagnose those with symptoms, testing for clinical care in healthcare settings, and testing to monitor population level prevalence, as occurs in the long running surveillance of other respiratory virus infections.

As national prevalence reduces to this very low level, with potential seasonal increases as with other respiratory disease, the role of national routine asymptomatic testing programmes will change. Principle 4 of our Testing Strategy Principles is that our approach to testing takes full recognition of the limitations of testing (particularly at low levels of disease prevalence) as well as the opportunities of testing.

At these low levels of disease prevalence, the likelihood of positive test results actually being false positives – the person tested is not infectious – increases. At a certain point, this means the benefit of routine asymptomatic testing may be outweighed by the harms caused. These risks – of false positive results and false negative results – are related to both the attributes of the test and the likelihood of there being cases in a community.

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As we return to geographically variable levels, some parts of the country will experience this fine balance of benefit of routine testing compared to harms sooner than others. To mitigate the risk of false positive results requiring an individual and their household to self-isolate unnecessarily, as long as routine testing programmes continue we will continue with our current policy of advising all those who receive a positive result with an LFD test to book a confirmatory PCR test. To mitigate the risk of false negative results we will continue to stress in all guidance, training and national and local communications that no test is 100% accurate, and that testing does not replace the need to comply with all other mitigations in place.

Monitoring and evaluation will be critical to informing decision making on when and where this balance is reached. Monitoring data will shortly be available across testing pathways and regularly published by Public Health Scotland in their weekly COVID-19 report. Work is also under way to develop an evaluation framework for this Strategy drawing on routine testing data, national surveys and local evaluations. We anticipate that interim results from the evaluation will be reported on in summer 2021.

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The strategic approach to testing necessarily adapts to the pandemic conditions facing us and the technology at our disposal. It is likely a further update will be required in the coming months.

The response to minimising transmission of COVID-19 has required population-wide measures in one of the largest public health interventions in a century. This has included the successful recruitment and roll-out of a specialised contact tracing workforce to deliver a critical public health intervention, with the requirement that large numbers of people who develop symptoms of the virus, test positive or have been in close contact with people who have tested positive, do not leave their place of accommodation for a prescribed period.

While this strategy update has focussed on developments in testing; we know that testing does not – in and of itself – reduce transmission of the virus. It provides information that can support action that reduces that transmission – action that includes contact tracing and supporting the isolation of positive cases. Contact tracing and supporting isolation as interventions have also required regular adaptation to the conditions of the pandemic to date, and will require ongoing flexing as the pandemic moves through future stages.

Contact Tracing

Within the wider Test and Protect intervention for Scotland, our contact tracing system continues to play a key strategic role in the pandemic response.

The contact tracing system has, since the inception of Test and Protect in May 2020, worked to reduce community transmission of the virus by identifying and isolating individuals at high risk of being infected because of close contact with positive cases. We have throughout prioritised, and will continue our commitment to enhance quality and user experience within the system, alongside ensuring the system is able to manage demand and that timely interventions continue to take place.

While contact tracing is underpinned by national strategy, the service is predominantly locally led and informed by local public health expertise, with support provided at a national level by strategic and delivery partners.

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The key strategic objectives of the intervention are:

- tackling local outbreaks by identifying and interrupting chains of transmission in a timely manner;
- supporting compliance with self-isolation through follow-up communication; and
- acquiring ongoing intelligence on transmission patterns to inform local understanding of risk and to keep case numbers as low as possible (i.e. enhanced backwards tracing as a priority deliverable when capacity allows).

Typical ‘forwards’ contact tracing is concerned with identifying the close contacts of confirmed positive cases who have been exposed to infection to advise them to isolate in case they are infectious. Enhanced ‘backwards’ contact tracing refers to efforts to identify the source of the infection of the case being investigated, and identify possible commonalities in this source with other cases, which can help, both, investigate if there are further cases associated with the same source, and, add to the evidence base of settings or situations that are transmission risks.

As we move forward into the next phase of the pandemic response, the priority is that the system is able to continue to cope with differing levels of local and national prevalence of the virus. This enables the intervention to be proportionate in achieving the aim of minimising the spread of the virus, by drawing on the experiences and expertise built up during pandemic to date. As the next phases of the pandemic are likely to be characterised by clusters and outbreaks, cluster based backwards contact tracing – as has already been the practice in Scotland – will continue in importance.

Support for Isolation

Testing and contact tracing are only successful in actually reducing transmission if people are able to isolate until they receive their test result, continue to isolate if positive, or are able to isolate if advised to do so by a contact tracer. For a significant proportion of the population this requires a range of practical and financial support.

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Support measures delivered to provide additional assistance to people self-isolating, where required, include:

- the provision of practical support including access to food and medication, when people self-isolating are not able to access these;
- the provision of financial support for people self-isolating in low-income households, who lose income as a result of self-isolating; and
- providing access to local support services for people self-isolating including through the third sector and statutory services.

To date, the isolation support strategy has intended to increase levels of compliance with public health advice related to the need to self-isolate by recognising that most people want to comply but that practical and financial barriers may prevent them doing so. The evidence base on levels of compliance with self-isolation is mixed over time – most recent research by University College London published in January 2021 found relatively high compliance with around 80% of close contacts of a positive case isolating entirely in line with the guidance.

As the roll-out of the vaccination programme continues, the evidence base for the efficacy of the vaccine in reducing transmission develops and prevalence of the virus reduces, it will be necessary to evaluate the isolation support offer more broadly to ensure it remains fit for purpose. There is a significant opportunity to consider what the future of support for people self-isolating requires in relation to COVID-19 and, in utilising the substantial evidence base developed as a result of the pandemic, to consider how this public health intervention should operate broadly.

In considering the short- and medium-term needs for isolation support the Scottish Government will:

- utilise Scotland-specific research information to ensure the views of people with lived experience of self-isolation continue to be represented in the development and delivery of policy interventions; and
- continue to work with delivery partners and local authorities to ensure there is adequate resource to continue delivering support for people self-isolating, and to deliver increased capacity should progress made in reducing transmission be reversed.

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As part of the longer-term strategy for self-isolation, the Scottish Government will:

- consider how the powers set out in the Public Health etc. (Scotland) Act 2008 and the experience of COVID-specific self-isolation support could deliver an effective self-isolation support model in future related to any future public health interventions;
- analyse the substantial body of research and evidence relating to self-isolation, including Scotland-specific research information, to consider how to deliver the most effective interventions for any future public health interventions; and
- utilise feedback from support services and the views of people with lived experience of self-isolation to consider further how to ensure that support provided to people self-isolating enables them to comply with self-isolation in a way that ensures their practical, financial and emotional needs are met.

Test and Protect will continue to play a key role in suppressing the virus to the lowest possible level in Scotland and keeping it there, while we strive to return to a more normal life for as many people as possible. Continuing to invest in every part of test and protect – testing, contact tracing and supporting isolation – is key. Building on our experience and intentionally developing our capability in whole genome sequencing and other forms of testing will also leave Scotland with a legacy that means we are better prepared for future health threats – by continuing to build a world-class public health system.



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