National Audit Office

Report
by the Comptroller
and Auditor General

Department of Health & Social Care

The government's approach to test and trace in England – interim report

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Key facts

£22 billion	budget for the NHS Test and Trace Service (NHST&T) for 2020-21
£4 billion	expenditure by NHST&T to the end of October 2020
407	contracts, worth £7 billion, let to public and private organisations for supplies, services and infrastructure to support testing and tracing
154	additional contracts, worth £16.2 billion, to be let between November 2020 and March 2021 (not all expenditure falls in the current financial year)
23 million	number of tests done in hospital (Pillar 1) and community (Pillar 2) settings in England between 28 May and 4 November 2020
850,000	number of positive cases identified through testing between 28 May and 4 November 2020
630,000	number of people testing positive for COVID-19 who NHST&T reached and asked to provide information about their contacts between 28 May and 4 November 2020
1.4 million	number of close contacts of people testing positive for COVID-19 who NHST&T reached and advised to self-isolate between 28 May and 4 November 2020
41%	average proportion of those tested in person in the community from 28 May to 4 November 2020 (under Pillar 2 of the testing system) who received their results within the target timeframe of 24 hours
66%	the proportion of close contacts NHST&T reports having reached and advised to self-isolate, from 28 May to 4 November 2020. The Scientific Advisory Group for Emergencies advised that an effective test and trace system should reach at least 80% of close contacts of index cases
68%	average laboratory capacity use from 1 May to 31 October 2020, peaking at 93% during September
1% – 56%	range of daily utilisation rates for national tracing service call handlers (Tier 3) between 1 August and 31 October 2020

Summary

Introduction

1 Test and trace programmes are a core public health response in epidemics that can be used with other measures such as social distancing, barriers (such as masks) and handwashing to reduce infections. The basic principles of test and trace are identifying individuals, or groups of individuals, with an infectious disease, and tracing their contacts to limit further transmission. Through early identification, potentially infectious contacts can be encouraged or obliged to reduce interactions with other people, thereby reducing the spread of disease.

2 At the start of the COVID-19 outbreak, Public Health England (PHE) carried out comprehensive test and trace activities for the relatively low numbers of infections. As infection levels grew, government introduced a national lockdown as the main way of reducing transmission of COVID-19, suspending comprehensive contact tracing in mid-March. From April onwards, the Department of Health & Social Care (the Department) significantly scaled up testing capacity in England. On 28 May 2020, government announced the launch of the new NHS Test and Trace Service (NHST&T), to lead on four areas of pandemic response, known as test, trace, contain and enable, and to bring these together into a single national programme.

3 NHST&T's overall aim is to "help break chains of COVID-19 transmission and enable people to return to a more normal way of life". In July it published a number of specific objectives, focussed on increasing the scale and speed of test and trace activities (see paragraphs 12 and 20). Advice from the World Health Organization and the UK's Scientific Advisory Group for Emergencies (SAGE) confirms that testing and tracing systems can contribute to reducing COVID-19 infection levels under certain conditions (see paragraphs 24 and 25).

4 Within government's overall response to COVID-19, the Department has responsibility for several policies intended to limit virus spread, including testing and tracing. Other public bodies with responsibility for developing and providing test and trace services are:

- NHST&T, part of the Department, which leads on the overall test and trace programme, working in conjunction with PHE and English local authorities.
- PHE, which is England's expert public health agency, with responsibilities for public health advice, analysis and support, and the response to public health emergencies. It carries out some laboratory testing, and contact tracing for higher risk cases in liaison with local authorities.
- Local authorities, which lead local outbreak planning and employ directors of public health, who have a statutory duty to control local disease outbreaks. Local authorities can set up their own contact tracing schemes and provide support for people who are self-isolating.

5 This is the first of two reports. This interim report provides an overview of test and trace services for addressing COVID-19 in England, including how the government's approach has developed, and how it managed performance and capacity in the period from May to October 2020. This report does not cover post-October planning for mass testing. It covers some aspects of public engagement efforts in relation to improving compliance with tracing. We intend to publish a further report in spring 2021 which will provide a fuller value-for-money assessment of test and trace. This will include an update on spend and performance, and matters not covered here, including examining the end-to-end process in more depth, the development and implementation of the contact tracing app, and a detailed look at elements of contract management.

Key findings

Government's approach to test and trace

6 In the past six months, the government has achieved significant increases in testing activity, and set up a national contact tracing service from scratch; as a result millions of people have discovered whether they have COVID-19 and whether they should self-isolate. On 28 May, the government launched NHST&T, bringing together a national programme for testing and tracing. Since then, both testing and tracing activity have increased significantly. For example, between the end of May and the end of October, the daily number of swab tests processed for community and hospital testing quadrupled, while the weekly number of contacts reached and advised to self-isolate had increased nearly four-fold. In total, between 28 May and 4 November, the system processed 23 million tests (from community and hospital settings) for England, found 850,000 positive cases. It also reached 630,000 people who tested positive to ask them for information about their contacts, along with more than 1.4 million of the contacts, through its tracing service. Much of the infrastructure and capacity to support these activities did not previously exist. During April and May, the government had to rapidly scale up tracing capacity to establish a national system of community contact tracing for COVID-19. In its first week of operation, this reached 50,000 contacts of people who had tested positive for COVID-19 (paragraphs 1.12, 1.36, 2.13, 3.11 and 3.14 and Figure 11).

7 The government did not document the basis for the delivery model it chose for the national test and trace programme in a business case until September 2020. NHST&T built on the central delivery model already being developed for testing. It also extended this to tracing, in conjunction with the existing PHE capacity. The government planned for a very rapid scaling up of tracing capacity. A range of stakeholders have queried why the government did not involve local authorities more in its initial approach to tracing, given their previous experience in this area. We have seen evidence that in April and May the Department considered, but ruled out as unfeasible, obtaining the call handler resources it needed from existing civil service staff and central government call centres, but not whether it could make use of local authority capacity for this. NHST&T told us that, in the time available, the only feasible approach was to focus first on building up tracing capacity centrally. A retrospective business case in September noted that the option of fully localised delivery (with no national capacity) would neither sufficiently reduce transmission levels nor provide value for money but it did not consider other forms of localised model. Local government stakeholders expressed concern that they had not been sufficiently engaged on the design and implementation of test and trace services. NHST&T has sought local engagement and feedback in a number of ways, including senior-level secondments from local authorities, advisory groups such as its local authority design group, and activities such as the pilots for mass testing and door-to-door testing (paragraphs 1.6 to 1.9 and 2.24).

8 **NHST&T has a budget for 2020-21 of £22 billion, with most funding assigned to testing.** This includes a £15 billion budget confirmed before the November Spending Review, of which around 85% (£12.8 billion) is for testing. Of this, £10 billion is to fund current testing activity with the remainder for a mass testing programme, which commenced in September. Planned spending on tracing is £1.3 billion. Up to the end of October, NHST&T had spent a total of £4 billion, about £2 billion less than forecast, due to underspending on laboratories, machines and mass testing. The November Spending Review introduced an additional £7 billion to increase testing and tracing as part of government's COVID-19 Winter Plan, taking the overall funding to £22 billion. This means there was a remaining budget of some £18 billion in the last five months of the financial year (paragraphs 1.28 to 1.31).

9 **NHST&T has signed 407 contracts worth £7 billion with 217 public and private organisations.** NHST&T relies on contractors for many of its supplies, services and infrastructure. It estimates it will sign a further 154 contracts worth £16.2 billion between November 2020 and March 2021 (with not all that spending occurring in this financial year). As with many other government procurements during the pandemic, 70% of early contracts by value were assigned as direct awards without competition under emergency measures. NHST&T told us that, given the need to scale up operations at speed, it had to use the private sector to respond quickly, for example in expanding the diagnostic industry and to employ a large number of central contact tracers. An internal government review of 15 other countries' test and trace approaches noted that some had used private sector outsourcing to increase testing capacity, but none had done so to increase tracing capacity, which was generally built up from existing tracing and public health expertise (paragraphs 1.10 and 1.33 to 1.34).

10 **NHST&T's services combine many new and pre-existing services operated by a range of bodies.** The test and trace service is a number of discrete services provided by different organisations. A principal challenge for NHST&T's management has been to connect them into an effective end-to-end process supported by appropriate systems, processes and information so that users experience a single user journey and all necessary experts and officials receive accurate and timely data. NHST&T's initial focus was on creating a "minimum viable process". It is now seeking to refine, integrate and stabilise that process so it operates reliably at scale (paragraphs 1.17 to 1.18).

11 **NHST&T has an unusual organisational relationship with the Department, with unclear accountability.** NHST&T is subject to the Department's financial, information and staffing controls, but its head, the executive chair, does not report to the Department's ministers or permanent secretary, but rather to the Prime Minister and the Cabinet Secretary. This direct reporting line to the Prime Minister and the Cabinet Secretary is a clear indication of NHST&T's importance to government as a whole. However, since the body is embedded within the Department, these dual reporting lines bring risks of unclear accountability. We have not undertaken a systematic review to determine whether these risks have materialised and to date have seen no evidence that they have (paragraphs 1.19 to 1.20).

Testing capacity, activity and performance

12 NHST&T has committed to provide rapid testing, at scale, that is reliable, accessible and able to focus on high-risk groups, locations and specific outbreaks. Since July, it has been pursuing a number of key objectives, including reaching 500,000 tests a day by the end of October, and providing results within 24 hours to people who take their tests in person (paragraphs 2.2 and 2.10).

13 Since spring, NHST&T has set up new testing sites and an expanded network of diagnostic laboratories to deliver testing nationwide, adding to existing NHS and PHE infrastructure and by contracting with the private sector. The Department gradually widened eligibility for testing from March to May, when testing was made available to the general public. Most testing is intended for people displaying symptoms of COVID-19. However, since July, there has been regular testing of asymptomatic staff and residents in care homes. This includes:

- NHS staff and patients, and some vulnerable groups, tested in hospitals or care homes with these tests processed in NHS or PHE laboratories (known as pillar 1 testing); and
- members of the public who self-refer, book and attend a test at a local, regional, mobile or satellite testing site or request a home test. These tests are processed in lighthouse or partnership laboratories (known as pillar 2 testing).

NHST&T is operating 593 testing sites and 15 laboratories and plans to add a further 15 lighthouse laboratories and two high-capacity 'mega-laboratories' in January 2021 (paragraphs 2.3 to 2.4 and 2.24).

14 Of the £15.1 billion made available to NHST&T before the November Spending Review, £12.8 billion (85%) is intended for testing. This includes £5.9 billion for laboratories and machines, £2.9 billion for mass testing and £1 billion for supplies and logistics. Much of this is paid to private companies and other public institutions under a variety of contractual arrangements. NHST&T sees this as an investment in a diagnostics industry that will bring long-term benefit but for this report we have not reviewed its strategy in this regard. The largest 10 suppliers of NHST&T are mainly for the testing programme, including for surveys to establish the prevalence of COVID-19 in the population, testing kits and equipment, logistics, and laboratory operators (paragraphs 1.28 to 1.30, 1.33 and 2.4).

15 Testing capacity increased five-fold between May and October, in line with plans to reach the public target of 500,000 available tests per day on 31 October, but the actual number of tests processed daily is below reported capacity. NHST&T set itself an ambitious target to expand its overall capacity to test people. Focusing on overall capacity has been useful to drive a major expansion of testing infrastructure, but the measure only indicates the system's theoretical maximum capacity on any given day and not what has actually been achieved. This capacity has seldom been used in full and at times tests have been rationed at levels below the maximum, meaning that some people who needed a test could not get one. NHST&T recommends that laboratories use 85% of theoretical maximum capacity in normal times. On average the number of tests carried out has been only 68% of the reported maximum since May, although this has fluctuated throughout the pandemic. We will revisit this matter in our next report to understand the reasons why capacity has not been used. NHST&T has ambitious plans to increase its maximum testing capacity to 800,000 tests a day by the end of January (paragraphs 2.11 to 2.14 and 2.24).

16 NHST&T has not met a target to provide results within 24 hours for tests carried out in person in the community. Performance on turnaround times for tests carried out in person in the community (pillar 2) peaked in June with 93% of test results provided in 24 hours, but this has since deteriorated to a low of 14% around mid-October. The performance then improved a little, with 38% of results reported within 24 hours by the beginning of November. Turnaround times for pillar 1 (hospitals and care homes) has consistently been around 90% although these are measured on a different basis (paragraphs 2.22 to 2.23).

17 NHST&T did not plan for a sharp rise in testing demand in early autumn when schools and universities reopened. The September spike in demand was much larger than NHST&T expected so it did not take adequate steps to prepare for it. Laboratories processing community swab tests were unable to keep pace with the volume of tests and experienced large backlogs, which meant that NHST&T had to limit the number of tests available, lengthen turnaround times, and commission extra assistance from NHS and 'surge' laboratories. Rationing of community tests in some geographical locations meant that average travel times to test sites lengthened in August and September with some potential users told to visit test sites hundreds of miles away. NHST&T could face similar spikes in future, perhaps owing to a surge in cases in the general population, or the end of the university and school terms in winter and if this happens it will need to consider again how best to balance processing volumes against speed of turnaround (paragraphs 2.17 to 2.20).

Contact tracing capacity, activity and performance

18 Government budgeted £1.3 billion in 2020-21 to establish and run a national tracing system from the end of May. The national service, consisting of text and email communications and a pool of central telephone tracers, was intended to deal with the majority of positive cases, while PHE regional teams had responsibility for tracing cases linked to potential outbreaks, for instance in workplaces or hospitality venues. In its first week of operation, NHST&T reached around 5,900 people who had tested positive for COVID-19 (cases) and more than 50,000 of those they had been in close contact with (contacts). The £1.3 billion budget for tracing included up to £720 million on contracts with Serco and Sitel for central call handlers. Actual expenditure on tracing up to the end of October was £478 million. In addition, the government has given £785 million in grants to local authorities to support their COVID-19 response, which could include tracing activities (paragraphs 1.29, 3.8, 3.11, 3.14 and 3.28).

19 Since July, local authorities have assumed a bigger tracing role, setting up their own schemes in conjunction with the national arrangements. The Department initially told local authorities to focus on working with PHE to "investigate and control outbreaks". By July, local authorities had started to set up their own locally run contact tracing schemes to cover the minority of cases that the national service cannot reach, working in conjunction with NHST&T. In August, NHST&T reduced the number of national-level contact tracers and designated a proportion of its specialist tracing staff to work exclusively to facilitate those local authorities that had their own scheme. By the end of October, 40% (60) of local authorities had a scheme in place, with a further 46% (69) planning to set one up. However, local government stakeholders told us that some authorities were being held back from developing their own arrangements by lack of funding or lack of clarity about whether funding would be available. At the end of October, NHST&T acknowledged that there needed to be better co-ordination of its tracing strategy and the growing range of national and local approaches (paragraphs 3.19 to 3.21, 3.23 and 3.24).

20 NHST&T published broad ambitions for the tracing service, and subsequently set some internal targets. NHST&T's July business plan set out objectives for the following three to six months. For tracing, these were mostly broad ambitions rather than specific or quantifiable targets. One ambition included increasing the number of contacts the service reached and advised to self-isolate, both by increasing the overall number of people being tested and by increasing the proportion of contacts reached who went on to self-isolate. A second ambition was to reduce the average time taken to reach contacts. NHST&T later developed some internal metrics and targets for its performance, including that 80% of people testing positive for COVID-19 would complete tracing, and that it would take 48–72 hours to advise close contacts to isolate following an initial person developing symptoms (paragraphs 1.25 to 1.26 and 3.5).

21 Tracing performance has fluctuated since May, with a substantial increase in activity during October. The proportion of cases reached and asked to give details of their contacts has fluctuated but as at the end of October was 85%, higher than the proportion at the end of May (73%). By contrast, the overall proportion of contacts reached and advised to self-isolate has dropped, from 91% in the last week of May to 60% in the last week of October. In part, this reflects a change in the types of cases, with a smaller proportion being linked to outbreaks, where it can be easier to reach a large number of contacts (for instance, all residents and staff in a care home). Numbers of cases covered by the service remained low over the summer, but more than quadrupled during October, with a similar pattern for close contacts. For both cases and contacts, the time taken to reach them generally increased from May to mid-October, before improving in the last two weeks of October. For example, the proportion of contacts reached by the national service within 48 hours stood at 87% at the end of May, before dropping to 64% in the middle of October, and rising to 81% by the end of that month. Taken together, these indicators suggest that progress against the ambitions NHST&T set in its business plan has been mixed (paragraphs 3.6, 3.11 to 3.13, and 3.15 to 3.16).

22 There has been no shortage of central tracers and, at times, parts of the national tracing service have been barely used. In May, the Department signed contracts for the provision of 3,000 specialist health professionals and 18,000 call handlers for an initial three-month period. It had very limited and uncertain information to determine what initial level of contact tracing capacity would be required. During the initial three months, the call handler contracts had no provision to vary the staffing levels that the Department had set, but the Department quickly became aware of the possibility of excess capacity. By 17 June, there were low utilisation rates for both specialist health professionals (4%) and call handlers (1%). Flexibility clauses, allowing the Department to change staffing levels, were introduced to the call handler contracts from 17 August, after which it immediately reduced its paid-for capacity from 18,000 to 12,000 staff. However, utilisation rates for call handlers remained well below the target of 50% throughout September and for much of October. Spend on the call handler contracts up to the end of January was projected to be 22% lower than had been budgeted (paragraphs 1.7, 3.28 and 3.33).

23 While NHST&T has got better at providing local authorities with timely access to relevant data since May, it continues to manage a number of risks relating to data quality and security. Local authorities need data on positive cases in their area for monitoring infections, managing outbreaks and to support contact tracing. NHST&T told us that to start with it had to resolve a number of data governance and security issues before it could share detailed data on cases. This meant that local authorities did not always have the information they needed, but local government stakeholders noted that these early problems have largely been resolved. NHST&T continues to manage a number of significant data risks, including the possibility of data breaches (as some tracing staff have wide access to contact details). Weaknesses in current systems will not be fully resolved until a planned upgrade of contact tracing software, scheduled for January 2021 (paragraphs 3.35 and 3.36).

Ensuring NHST&T contributes to reducing infection levels

24 The Scientific Advisory Group for Emergencies (SAGE) has provided advice on what a testing and tracing system needs to achieve in order to be effective; to date NHST&T has not achieved these standards. In May, SAGE advised that an effective test and trace system needed to reach at least 80% of close contacts of index cases.[1] Between 28 May and 4 November, NHST&T reported reaching 66% of close contacts and advising them to self-isolate (1.4 million of 2.1 million close contacts identified).[2] This proportion will not take into account the close contacts of those testing positive and whom NHST&T does not reach to identify their close contacts. Between 28 May and 4 November, NHST&T reached 82% of people with a positive test and asked them for information about their contacts. NHST&T's internal targets for the time taken to advise close contacts to isolate following an initial person developing symptoms is 48-72 hours, although SAGE emphasised the importance of isolating contacts within 48 hours of identifying an index case. Since May the service has taken longer than 48 hours to reach many contacts (paragraphs 1.13 to 1.15, 2.25, 3.11 and 3.16 to 3.17).

25 The high reported levels of non-compliance with self-isolation represent a key risk to NHST&T's success; national and local government have been trying to increase public engagement. SAGE noted that a high level of adherence to requests to self-isolate would be required for NHST&T to be effective, including that at least 80% of contacts of index cases would need to self-isolate. Different survey-based measures, using different questions and time periods, suggest that contacts' levels of compliance with requests to self-isolate might range from 10% to 59%. Government is using a combination of financial support and legal penalties to increase compliance, including fines for failing to self-isolate, and support payments for people on lower incomes. NHST&T acknowledges that non-compliance poses a key risk and has taken steps to monitor and increase levels of self-isolation, for example making follow-up calls to people during their isolation periods. The Association of Directors of Public Health has called for better understanding of users' barriers and likely behavioural responses throughout the process (paragraphs 1.13, 3.37 and 3.39 to 3.41).

1 Index case is the term used in the published SAGE minutes.
2 The Department requested that we note that its published data uses definitions supported by advice from the Office for National Statistics and the results of a rapid review which it commissioned from the UK Statistics Authority, and that it cannot agree any alternative presentations of these data.

Concluding remarks

26 This is an initial review of the aims, funding and performance of the government's approach since May. We found that overall NHST&T had achieved a rapid scale-up in activity in respect of both testing and tracing, and had built much new infrastructure and capacity from scratch. However, issues with implementation and potentially the initial choice of delivery model mean that it is not yet achieving all its objectives. As it plans and rolls out further changes in COVID-19 testing, including the introduction of rapid turnaround tests and mass testing, government needs to learn lessons from its experience so far. It is very important that testing and tracing is able to make a bigger contribution to suppressing the infection than it has to date.

27 We highlight here the most significant risks and issues that NHST&T needs to address in the immediate future. It should:

a **explore how to make fuller use of its theoretical maximum testing capacity each day,** so that existing infrastructure and resources are efficiently employed and more of those infected with COVID-19 can be identified and their contacts traced;

b **plan against a range of plausible outcomes to ensure it has flexibility to respond to predictable and unexpected spikes in testing demand**. Problems emerged when schools and universities reopened in September, despite a predictable spike in demand. NHST&T also needs to have contingency plans in place so it can respond to unexpected spikes in community testing, in order to provide an effective service, maintain public confidence, and ensure availability of testing for hospital patients;

c **set out a clear strategy for how national and local tracing teams will work together, informed by a good understanding of local authority capacity and performance.** The number of local authority-run schemes is set to increase, and NHST&T needs to be clear about how national and local services align, and who is best placed to carry out activities. It also needs to understand what local authority capacity and funding are required to deliver its objectives;

d **model and communicate as early as possible how changes in testing policy are likely to affect the workload of national and local tracing services.** Such changes could include increased testing of certain categories of key worker and the introduction of mass testing (formerly referred to as Operation Moonshot);

e **take steps to increase public engagement and compliance with self-isolation**. NHST&T is one of a number of bodies, alongside local authorities and the police, who can influence compliance. It must work closely with these bodies, drawing on the best public health and behavioural expertise to identify how its actions can best contribute. For as long as compliance is low, the cost-effectiveness of NHST&T's activities will inevitably be in doubt;

f **take account to the maximum extent possible of value for money and normal commercial good practice as it procures new infrastructure and services.** In particular, it needs to have sufficient flexibility in future contracts to allow government and contractors to respond effectively to changing requirements at reasonable cost; and

g **embed strong and sustainable management structures, controls and lines of accountability.** We have noticed arrangements where accountability does not clearly align with organisational and strategic objectives in other aspects of the government's COVID-19 response. With the creation of the National Institute for Health Protection, there is an opportunity to clarify arrangements.