About HSIB

We conduct independent investigations of patient safety concerns in NHS-funded care across England. Most harm in healthcare results from problems within the systems and processes that determine how care is delivered. Our investigations identify the contributory factors that have led to harm or the potential for harm to patients. The safety recommendations we make aim to improve healthcare systems and processes, to reduce risk and improve safety.

We work closely with patients, families and healthcare staff affected by patient safety incidents, and we never attribute blame or liability.

Considerations in light of coronavirus (Covid-19)

A number of national reports were in progress when the Covid-19 pandemic significantly affected the UK in 2020 and 2021. Much of the work associated with developing the reports necessarily ceased as HSIB's response was redirected.

For this national report, the investigation was initially paused, but then restarted due to its association with Covid-19. The processes HSIB used to engage with staff and families had to be adapted. Changes are described further in this report.

A note of acknowledgement

We would like to thank the Patients and families whose experiences are documented in this report for their ongoing support and involvement. We would also like to thank the healthcare staff who engaged with the investigation for their openness and willingness to support improvements in this area of care.

We would like to thank the subject matter advisors who gave their time to provide information and expertise that contributed towards this report, and the stakeholder organisations and professional bodies that supported the investigation.

About this report

This report is intended for healthcare organisations, policymakers and the public to help improve patient safety in the delivery of NHS 111 telephone services during a national healthcare emergency. For readers less familiar with this area of healthcare, medical terms are explained in **section 1**.

Executive Summary

Background

The purpose of this investigation is to support improvements in the delivery of NHS 111 and other telephone triage services during a national healthcare emergency. The investigation uses real patient safety incidents involving Patients and their families who dialled NHS 111 (and were either managed through NHS 111 or the Covid-19 Response Service [CRS]) for advice during the Covid-19 pandemic. These are referred to as 'reference events' and support examination of the national issues.

The four reference events used in this report occurred in the early months (March–June 2020) of the pandemic, but the report also highlights learnings and developments from later in the pandemic.

The reference events

The investigation held two focus groups with families who wanted to share their experiences of calling NHS 111 for Covid-19 related symptoms. The focus groups identified issues around getting through to NHS 111 and with the advice provided by NHS 111, both of which contributed to delays in their family member receiving treatment.

To explore these concerns in more detail and to identify other common themes, the investigation selected four patient stories ('the reference events') described by participants at the focus groups, and tracked those events from each Patient's first call to NHS 111 with Covid-19-related symptoms until their last contact.

Vincenzo

Vincenzo was a 62-year-old man with diabetes. Vincenzo began to feel unwell with Covid-19 related symptoms in March 2020, and he and his family called NHS 111 on multiple occasions between 17 and 23 March. Some calls were not answered. When calls were answered, Vincenzo was advised to self-care at home. On 26 March, Vincenzo's condition deteriorated and his family called 999. He died in hospital on 1 April 2020.

Ali

Ali was a 66-year-old man with diabetes and hypertension. He had experienced an ongoing cough for 3 weeks, but did not become unwell or display further Covid-19 related symptoms until a few days before his death. Ali and his wife made three calls to NHS 111 between 6 and 9 April 2020. Calls resulted in Ali receiving a clinical

The investigation:

- reviewed research and other literature relevant to each of line of enquiry
- engaged with national experts in the field of triage, conversational linguistics and patient safety
- explored the telephone triage systems used for managing patients with Covid-19, and barriers to them being delivered as intended
- engaged with multiple stakeholders and service providers.

National investigation findings

- In March 2020, demand on the NHS 111 system increased. Demand exceeded the system's capacity, and around half of calls were answered at that time.
- Evidence from families indicated that aspects of NHS 111 telephone triage, such as routing all Covid-19-related calls to the CRS, did not function as intended.
- Strong national messaging advised people with suspected Covid-19 to stay at home. This may have impacted on patients' willingness to seek medical advice from elsewhere, even if their condition deteriorated.
- The CRS algorithm did not allow for an assessment of caller's comorbidities to establish whether a clinical assessment would be beneficial. Callers would only be transferred to a clinician/receive a clinical call back if they were "so ill that … [they've] stopped doing all of …[their] usual daily activities".
- The healthcare system specified that patients with Covid-19 related symptoms and underlying conditions (including diabetes) who went through to core NHS 111 (instead of CRS) should be escalated to a clinician for assessment. However, some patients did not receive a clinical assessment.
- The intent was that Covid-19-related calls would be diverted to the CRS, which was operationally independent from NHS 111. Many Covid-19-related calls continued to go through the core NHS 111 service. Once callers had reached the core NHS 111 service, there was no way to route them to the CRS.
- Calls that went via the core NHS 111 service should have been audio-recorded, as per NHS 111 guidance. The CRS contract manager told the investigation that CRS calls were also required to be recorded, and all but one CRS provider were initially set up with a recording function. However, no recordings of CRS calls were made available to the investigation.

- NHS 111 call handlers do not usually have access to a patient's medical history. This increases the importance of appropriate 'safety netting' – that is, telling a patient or their carer what they should do if their condition does not improve or they have further concerns about their health.

- Text messages that told a patient they had a positive polymerase chain reaction (PCR) test result included information about isolating and the legal requirements. It did not include sufficient safety-netting advice regarding symptoms to watch for and when and from where to seek medical advice. While this is not related to NHS 111 services, the investigation considers it important to highlight for the future.

- Ahead of the Covid-19 pandemic, there was limited understanding of the risks of such a novel virus to the healthcare system.

- The decision to redirect the public to call NHS 111 rather than access healthcare advice in other ways (for example, through their GP) shifted the immediate burden of managing patients with Covid-19 in the community. This increased capacity, in the wider healthcare system, but risked disrupting continuity of care for patients with complex health needs.

- Learning and developments throughout the pandemic have led to improvements in how callers to NHS 111 are assessed and managed. These included recognising the importance of pulse oximetry (that is, measuring blood oxygen levels) to identify silent hypoxia (when a patient has low oxygen saturation levels without becoming breathless) in patients with Covid-19.

HSIB makes the following safety recommendations

Safety recommendation R/2022/206:
HSIB recommends that NHS England ensures any Single Service contract or additional services contracts reflects the minimum requirements of the core NHS 111 service for audio-recording calls.

Safety recommendation R/2022/207:
HSIB recommends that NHS England reviews the risks associated with increased use of telephone triage in response to national healthcare emergencies. Consideration should be given to applying any recommendations of this review across telephone triage services within the wider healthcare setting.

1.3 NHS 111 CRS

1.3.1 At the start of the pandemic, a dedicated telephone triage service for people with Covid-19-related symptoms – the CRS – was set up (5 March 2020). The aim was that anyone calling with concerns relating to Covid-19 would be managed through the CRS and have a Covid-19-specific assessment, while the core NHS 111 telephone service would continue to triage callers with non-Covid-19 related symptoms.

1.3.2 The CRS was managed by an ambulance service (dedicated CRS contract manager) and delivered by a range of private and NHS providers. The service was established in just under a week, and rapidly recruited nearly 6,000 health advisors to help process the high volume of calls from the public.

1.3.3 From April 2020 an additional 3,500 extra clinical staff were brought in to work in the Covid-19 Clinical Assessment Service (CCAS) (**see section 1.6**), including more than 1,500 retired clinicians (NHS England and NHS Improvement, 2020). This service enabled health advisors to place callers on a list to receive a clinical call back from a CCAS clinician if they reached that disposition.

1.4 Health advisor element

1.4.1 The health advisor element of the CRS was provided by Private Providers 1, 2 and 3 under previously signed (but dormant) contracts for a national influenza pandemic response. All private providers are required to adhere to guidelines provided by NHS England.

1.4.2 The CRS was reached by the public dialling 111 in the same way as they would normally seek core NHS 111 advice. Once a caller had dialled 111, they were invited to self-select which part of the NHS 111 service they needed: the CRS or the core NHS 111 service. The CRS was designed to triage patients reporting symptoms of Covid-19 to determine the most appropriate way to manage their symptoms. In the early days, the health advisors followed a paper algorithm assessment booklet and then informed the caller of the outcome/disposition reached based on their responses.

1.4.3 Calls to the CRS were answered by non-clinical health advisors from the private sector. These health advisors triaged each caller using the Covid-19 NHS 111 online assessment, which had been developed by NHSX/NHS Digital, and guided them to one of a number of dispositions (**see figure 2**).

Figure 2 Outcomes that could be reached through the CRS algorithm

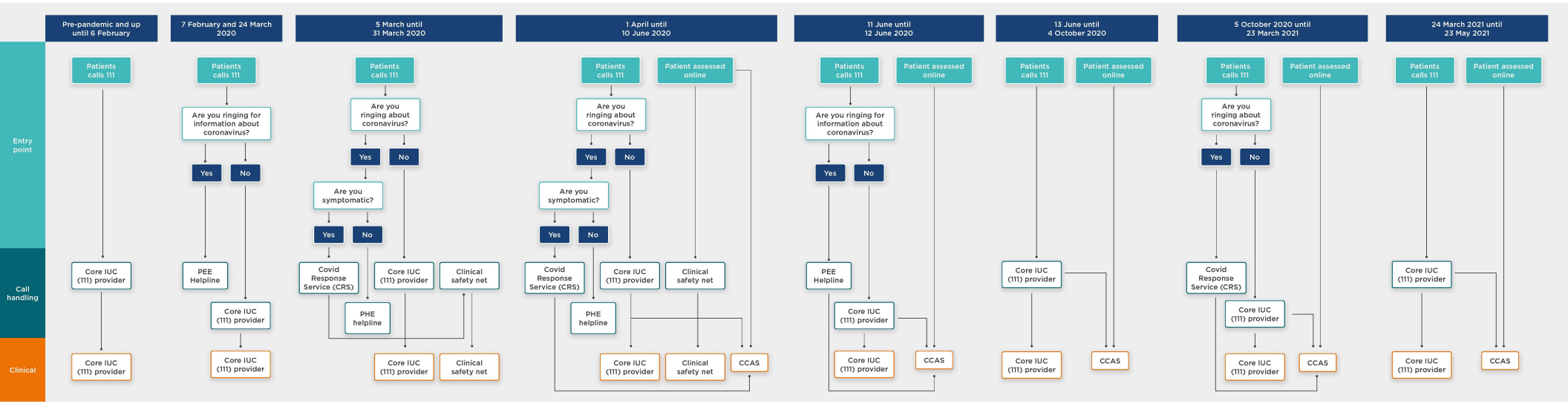
Outcome 1	Outcome 2	Outcome 3
You don't need to speak to anybody right now as you: • Do not have a cough • Do not have a high temperature	'You need further assessment by NHS 111' Advise Caller 'You will now be transferred to NHS 111 for further symptom assessment. The wait time to transfer can be long, if while waiting you become so ill that you are worried, feel faint, very short of breath, so much so that you cannot speak in sentences, then please put the phone down and call 999'	'You need to stay at home' 'Stay away from other people for at least the next 7 days, or until your symptoms have gone'

1.4.4 The telephone triage aspect of CRS was stood down on 8 June 2020, when NHS England felt that the core NHS 111 service – alongside diverting calls to other services such as 119 for non-clinical advice about Covid-19 vaccination and testing – were able to meet demand. The CRS's Covid-19 Clinical Assessment Service was retained to bolster the clinical support available to core NHS 111 services (NHS England and NHS Improvement, 2020). In order to meet demand, the CRS was stood-up on two further occasions:

- From 13 September 2020 to 23 March 2021
- From 19 January 2022 to 27 January 2022.

The CRS contract manager shared a timeline with the investigation which showed which services were active at which points in the pandemic (Figure 4).

Figure 4 A timeline showing when various CRS services were active



3.1.67 As in the case of Ali, external factors may have influenced the clinician's assessment of Dr C. It was early in the pandemic and routine Covid-19 testing in the community was not in place.

3.1.68 Given the public messaging, the clinician may have felt pressure to manage people at home as safely as possible. In addition, knowledge about the complexity and severity of Covid-19, especially in those with comorbidities (that is, other conditions in addition to Covid-19), was still developing. These factors may have influenced the clinician's perception of Dr C's condition at the time of the call and his likelihood of deteriorating.

3.1.69 This reference event also demonstrates some limitations of remote assessment, including how clinical features such as oxygen saturation levels, pulse, breathing rate and skin appearance cannot be fully assessed. Remote assessment is explored further in **section 4**.

3.2 Analysis of recurring findings across the reference events

3.2.1 The reference events allowed the investigation to explore factors that impacted the experiences of and care delivered to those calling NHS 111 with Covid-19 related symptoms. This section describes and analyses key recurring findings identified across the reference events.

System delivery inconsistent with prescribed model of care

3.2.2 In the reference events, the majority of the calls were routed through the core NHS 111 service, rather than through the CRS.

3.2.3 The CRS contract manager was clear about the system for managing callers with Covid-19-related symptoms. All callers with Covid-19 related symptoms should have been routed through the CRS. However, the callers in the reference events were all managed, on multiple occasions, through both the core NHS 111 core service and the CRS. The CRS contract manager told the investigation that for calls to have been dealt with by the core NHS 111 service, the caller would have had to select that option. However, families in the reference events were adamant they selected the appropriate option to be put through for Covid-19 related symptoms.

3.2.4 While the investigation found no evidence that this impacted on the advice provided, it does suggests that the system was not functioning as designed. It also placed additional strain on the core NHS 111 system, which was therefore taking both 'core' calls and those from people with Covid-19-related symptoms.

3.5 Recognition of symptom severity and impact of comorbidities

3.5.1 In all of the reference events, Patients were advised to remain at home and self-care. This advice was provided by health advisors who, following the algorithm, had reached the self-care disposition. The same advice was also given by clinicians, following a remote clinical assessment, during clinical call backs.

3.5.2 The investigation established that the CRS did not have the ability to identify or consider comorbidities when guiding callers through the online Covid-19 assessment. However, calls that were routed through core NHS 111 should have considered the callers comorbidities and any potential impact.

3.5.3 Vincenzo, Ali and Dr C all told the NHS 111 health advisors and clinicians that they had diabetes. Even in the early stages of the pandemic, it was suspected that diabetes put the patient at an increased risk of severe illness from Covid-19. National documents confirming this were not widely published until later in March 2020, after Dr C's contact with NHS 111, but before Ali and Vincenzo's contact (Diabetes UK, 2020). The Royal College of General Practitioners told the investigation that Covid-19 Clinical Assessment Service (CCAS) colleagues reported that assessment did steer them towards asking callers about comorbidities.

3.5.4 Patrick had multiple sclerosis, and his partner told the investigation that this was stated during his calls to NHS 111. Given the potential limitations of remote telephone assessments – where clinicians cannot necessarily make objective clinical findings or conduct a physical assessment – there may be a case for a lower threshold for face-to-face examinations in callers with comorbidities. This is explored further in **section 4**.

3.5.5 The investigation's conversational linguistics expert considered that, in all the calls recorded and made available for review, there was an overreliance on the Patient's description of their breathlessness as an objectively reportable symptom, when they may lack the ability to judge its severity. As the pandemic developed, clinicians found that not all patients with deteriorating oxygen saturation levels were breathless. This is known as 'silent hypoxia' (Vindrola-Padros, et al., 2021). However, this was not fully understood at the time of the reference events.

3.5.6 Families of some of the Patients involved in the reference events told the investigation that there were factors which may have impacted on the way in which their family member may have communicated and interpruted information with the Health Advisor. These included English not being the callers first language and a caller who was neurodivergent.

4.1.40 Given the magnitude of the demand on services the investigation tried to establish what checks and balances were in place to ensure all patients contacting the service received a reactive assessment based on their symptoms and taking account of any comorbidities. CRS was not designed to take account of comorbidities when guiding the caller through the online assessment. Whilst the core NHS 111 service should have taken account of comorbidities in their assessment, this did not always lead to clinical call backs in the reference events.

4.1.41 The investigation found that the Covid-19 virus was far more complex than the system was prepared for. Symptoms were more severe than expected and the impact of comorbidities was simply not fully understood in the early months. The assumption was that the response needed to be similar to that for the 2009 H1N1 (swine flu) pandemic. While it was impossible in the early days to know if this was a correct assumption, the system did not appear to be able to adapt in a timely way once it became clear that Covid-19 was a very different virus.

4.2 Pace of change

4.2.1 NHS Pathways responded to evolving knowledge of the virus by issuing paper-based work-arounds, which were released on a regular basis (often daily). These were followed by updates to the online algorithms. The algorithm updates were supported by an 'NHS Pathways release overview' document, which set out the changes, rationale and benefits of each update. These were issued to staff working for the core NHS 111 services who, as the CRS was in place, were less likely to be managing callers with Covid-19-related symptoms.

4.2.2 The role of CRS was to guide callers through the Covid-19 assessment – the algorithm used by the online assessment. Although it was updated inline with national guidance (to reflect changing symptoms) it was never adapted to enable comorbidities to be considered and assessed.

4.2.3 The first Covid-19-related paper workaround was released on 23 January 2020, and instructed health advisors on managing callers with possible Covid-19. There were a further 19 iterations of this workaround between January and March 2020, as the pandemic evolved. The first algorithms incorporating a Covid-19 assessment were released on 13 March 2020 (NHS Digital, 2020) and outlined the following principles for managing Covid-19-related symptoms.

- Stream the majority of the population to self-care and/or isolation advice, when appropriate and safe to do so.

- Use 111 online where possible.
- Ensure callers who are breathless and may need supportive therapy for Covid-19 are directed to an appropriate acuity of response.
- Identify vulnerable individuals who are at risk of serious infection.
- Limit face-to-face clinical interactions.
- All ambulance safety pathways will contain an alert for health advisors to notify the ambulance service of a Covid-19 risk. This applies to all ambulance dispatches, even if a Covid-19 risk was not initially identified.

4.2.4 Callers to NHS 111 could reach the CRS by listening to a pre-recorded message and selecting the CRS on an interactive voice response (IVR). This was managed by NHS England and implemented through the NHS 111 service. If a caller with Covid-19 related symptoms instead reached the core NHS 111 service, there was no route back to the IVR and the caller could not be transferred to the CRS.

4.2.5 Although the intention was that those calling about Covid-19 would be routed to the CRS by the IVR, it was understood that this would not always happen. Therefore, the core NHS 111 algorithms were updated to enable health advisors to triage callers reaching the core NHS 111 service with Covid-19-related symptoms. As such, the question "Are you calling about coronavirus?" within the core NHS 111 service did not result in a transfer to the CRS, and instead the caller would be assessed using the Covid-19 algorithm within the core NHS 111 service.

4.2.6 The investigation received conflicting information from across different parts of the system about precisely when the CRS was activated. However, an update from 13 March 2020 would suggest that the CRS was operational at this time.

4.2.7 The core NHS 111 Covid-19 pathway was divided into two main areas: symptomatic and non-symptomatic (**see table 5**).

Table 5 Symptomatic and non-symptomatic Covid-19 pathways

No symptoms	Symptomatic
• The caller is triaged according to whether they want general information or advice, testing or test results • (Other than calls regarding test results) All callers are asked if they have been diagnosed with a condition that puts them at risk of a serious infection • All callers with internet access are directed	• The assessment identifies whether the call relates to advice or symptom assessment or a request for testing or test results • Those under 65 years of age, not breathless and who say they can manage their symptoms at home are directed to www.nhs.uk for further advice, if they are able to access online information • If symptoms cannot be managed at home, then the caller should be divided into age-specific triage

4.2.6 The core NHS 111 Covid-19 pathway prompted health advisors to ask the following questions:

- Can the symptoms be managed at home with some advice?
- Have you been diagnosed by a GP or hospital specialist with any of these conditions? (Includes heart condition, lung conditions including asthma, diabetes).
- Figure 7 shows the advice health advisors gave to callers who were concerned they had Covid-19.

Figure 7 Advice to callers who were concerned they had Covid-19 from the 19 March 2020 NHS Pathways release overview

Instructions for call handler: Refer to National Covid-19 criteria for symptoms for other information.

- ☐ During the outbreak symptoms of cough or fever are likely due to coronavirus. The NHS advice is to stay at home and avoid public places. Go to the nhs.uk for the latest information.
- ☐ Try to avoid visitors to your home. Essential supplies can be dropped off.
- ☐ Do you not use public transport or taxis.
- ☐ Rest, drink plenty of fluids and make sure someone checks on you readily. Avoid unnecessary contact.
- ☐ Cover the mouth with a tissue when coughing or sneezing. Put use tissues into a bin immediately and wash their hands.
- ☐ If you are known to have a condition where in an infection may be serious you should call your usual healthcare provider.
- ☐ Unless advised not to take, paracetamol can be used to relieve pain or fever. Follow the instructions in the pack. If in doubt call your local pharmacy.
- ☐ If the conditions get worse or you have any other concerns, you must access nhs.uk online or call us back. Further information about coronavirus (Covid-19) an be accessed at nhs.uk.

4.2.7 On 30 March 2020, a further pathway update was released (release 19.3.5) (NHS Digital, 2020). This update included a Covid-19 level 4 switch. This was added at the request of the NHS England central ambulance team, and enabled ambulance category 3 (urgent calls – responded to at least 9 out of 10 times before 120 minutes) and category 4 (less urgent calls – responded to at least 9 out of 10 times before 180 minutes) dispositions reached by core NHS 111 health advisors using the Covid-19 algorithm to instead be redirected to a clinician, with a 'Speak to a clinician from our service immediately – Covid 19 Ambulance Validation (Dx3310)' disposition. This switch was only to be used by providers when advised by NHS England.

4.2.14 The Royal College of General Practitioners told the investigation that clinicians they have spoken to, who were part of the CCAS service, expressed their frustration that changes to the triaging system, including clinically significant changes, were not directly communicated to those teams. They often learned of the changes through seeing them in the system or communications through an IT information sharing platform.

4.2.15 Senior clinicians told the investigation that frontline staff were often reliant upon informal networks such as Twitter to communicate growing knowledge of the virus.

4.2.16 Clinicians also told the investigation that, once community testing for Covid-19 was available (April 2021) the advice provided on the text message/email informing of the result could have provided crucial safety-netting/worsening advice. The investigation acknowledges that the text messages provided a link to Covid-19 specific NHS information page, however there was no safety-netting contained within the text. While this is not related to NHS 111 services, the investigation considers it important to highlight for the future.

Summary

4.2.17 The above section illustrates the complexity of the commissioning, delivery and governance arrangements. It has been challenging for the investigation to fully understand the system as it was meant to be, and then map that against how the NHS 111 service was actual delivered. Staff in different parts of the system believed it operated in slightly different ways.

4.2.18 The findings of this investigation need to be set within the context of a pandemic of a novel virus. With this came the need for constant change as knowledge of the virus developed. NHS Pathways issued 35 releases in 2020, when typically it would expect to issue one every 8 weeks (6 or 7 a year). Each release had a section at the end entitled 'work-arounds', acknowledging that individual providers would have to implement deviations, which would inevitably create variations in care delivery.

4.2.19 The CRS contract manager told the investigation that the CRS followed the NHS 111 online algorithm at all times. Work-arounds and notifications of upcoming changes were sent out as alerts to all providers, who then provided that information to their front-line staff (health advisors and clinicians).

4.3 Call handling

Initial call handling

4.3.1 As described in **section 1.5.3**, all calls to the NHS 111 CRS were initially answered by a non-clinical health advisor who was trained to follow a algorithm and ask a specific set of questions about the caller's condition, which then guided them to reach a disposition. The investigation interviewed several health advisors and recognises the difficulty of their role in the early stages of the pandemic.

4.3.2 The investigation was not provided with data on the number of Covid-19-related calls that were managed by the core NHS 111 service rather than the CRS. The investigation was told that the only way people calling with Covid-19-related symptoms would reach the core NHS 111 service would be by selecting that option, rather than the CRS, when prompted by the IVR.

4.3.3 The telephone system had an IVR that directed callers to the most appropriate service: the core NHS 111 service or the CRS. The investigation was told that if a Covid-19-related call was routed to the core NHS 111 service then the core NHS 111 health advisor would manage that call, as it was not possible to transfer the call to the CRS. If the health advisor reached a 'clinical call back' disposition then the caller would be placed on the CCAS list to wait for a remote clinical assessment.

4.3.4 From the investigation's understanding of the system, while different algorithms were used by the core NHS 111 service and the CRS, there is nothing to suggest that callers with Covid-19-related symptoms would have received a less-detailed assessment from the core NHS 111 service. The core NHS 111 algorithm enabled a wider range of symptoms to be explored. If the health advisor at the CRS suspected a caller was experiencing anything other than Covid-19 then the call would be transferred to a core NHS 111 advisor for a wider, more detailed NHS Pathways algorithm-led assessment. However, if Covid-19-related calls were going through the core NHS 111 service then this shows that the system was working as intended, and the governance and monitoring arrangements did not identify this.

4.3.5 The algorithm release on 13 March included the question 'Have you been diagnosed by a GP or hospital specialist with any of these conditions?' The list of conditions included diabetes, heart and lung conditions (including asthma). However, focus group attendees told the investigation that patients with serious comorbidities (including diabetes) repeatedly reached a self-care at home disposition, often without a clinical call.