



HEALTHCARE SAFETY
INVESTIGATION BRANCH

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NHS 11's response to callers with Covid-19-related symptoms during the pandemic

Independent report by the
Healthcare Safety Investigation Branch I2020/028

September 2022

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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**.

Our investigations

Our investigators and analysts have diverse experience of healthcare and other safety-critical industries and are trained in human factors and safety science. We consult widely in England and internationally to ensure that our work is informed by appropriate clinical and other relevant expertise.

We undertake patient safety investigations through two programmes:

National investigations

Concerns about patient safety in any area of NHS-funded healthcare in England can be referred to us by any person, group or organisation. We review these concerns against our investigation criteria to decide whether to conduct a national investigation. National investigation reports are published on our website and include safety recommendations for specific organisations. These organisations are requested to respond to our safety recommendations within 90 days, and we publish their responses on our **website**.

Maternity investigations

We investigate incidents in NHS maternity services that meet criteria set out within one of the following national maternity healthcare programmes:

- Royal College of Obstetricians and Gynaecologists' 'Each Baby Counts' report
- MBRRACE-UK 'Saving Lives, Improving Mothers' Care' report.

Incidents are referred to us by the NHS trust where the incident took place, and, where an incident meets the criteria, our investigation replaces the trust's own local investigation. Our investigation report is shared with the family and trust, and the trust is responsible for carrying out any safety recommendations made in the report.

In addition, we identify and examine recurring themes that arise from trust-level investigations in order to make safety recommendations to local and national organisations for system-level improvements in maternity services.

For full information on our national and maternity investigations please **visit our website**.

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

call back to discuss his symptoms and advice to remain at home. Ali's condition deteriorated later in the day of the third call and he collapsed. His wife called 999, and Ali was declared dead by the paramedics on arrival. Records state that Ali died from acute respiratory symptoms, leading to a cardiac arrest, due to Covid-19.

Patrick

Patrick was a 60-year-old deputy ward manager with multiple sclerosis. Patrick was working on a designated Covid-19 ward at his trust, from which he was sent home on 2 April 2020 after developing a cough. He tested positive for Covid-19 on 4 April and isolated at home. Patrick made three calls to NHS 111 between 7 and 10 April, during which he was advised to remain at home and self-care. Patrick's condition deteriorated further, and on 11 April he contacted a nurse colleague for advice. He was told to call an ambulance immediately, which he did. He was taken to hospital and put on a ventilator. He died 8 days later, on 19 April 2020, due to Covid-19.

Dr C

Dr C was a 45-year-old man with type 2 diabetes. He made three calls to NHS 111 between 16 and 17 March 2020 regarding his Covid-19 related symptoms. On one occasion, Dr C received a clinical call back and was prescribed an inhaler and antibiotics for a suspected chest infection. On 18 March, Dr C's partner called 999 as his condition had deteriorated. He was assessed by the paramedics and taken to hospital. He died 16 days later, on 3 April 2020, due to Covid-19.

The national investigation

The Healthcare Safety Investigation Branch (HSIB) first identified a potential safety risk associated with NHS 111's response to callers with Covid-19-related symptoms when concerns were raised through HSIB's Citizens' Partnership (<https://www.hsib.org.uk/who-we-are/citizens-partnership>).

After a preliminary investigation, it was decided that the national investigation would seek to understand:

- the set-up, design and delivery of the Covid-19 telephone triage service accessed by the public by dialling 111 in response to the pandemic
- the context and contributory factors influencing the pathway for patients calling NHS 111 with Covid-19-related symptoms.

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.

HSIB makes the following safety observations

Safety observation O/2022/190:

It may be beneficial to review triage software and safety-netting/worsening advice to ensure the language used by health advisors does not deter seriously unwell people from calling back or seeking medical advice if necessary.

Safety observation O/2022/191:

It may be beneficial, when dealing with a novel virus, for consideration to be given to the benefits of a face-to-face assessment for callers with comorbidities.

Safety observation O/2022/192:

It may be beneficial for strategic stakeholders in the healthcare system to understand and articulate adjustments in risk tolerance and thresholds in critical situations.

During the investigation, HSIB became aware of changes the UK Health Security Agency made to processes in a number of areas. These 'safety actions' are noted below.

HSIB notes the following safety actions

Safety action A/2022/055:

The UK Health Security Agency has taken steps to ensure governance arrangements are in place to assure themselves that contracted services are monitored and delivered as intended.

Safety action A/2022/056:

The UK Health Security Agency has taken steps to assure itself of the safe and effective delivery of telephone triage for future healthcare emergencies. These have been tested through the delivery of services for Monkey Pox and Avian Flu.

Safety action A/2022/057:

The UK Health Security Agency has taken steps to review contractual arrangements to ensure flexibility and the opportunity to implement the most appropriate contract for future public health issue.

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1 Background and context

This investigation considered the response of NHS 111 in delivering services to patients who called with potential Covid-19 related symptoms in the early stages of the Covid-19 pandemic (March–June 2020). NHS 111, for the purposes of this report, refers to the core NHS 111 telephone service and the Covid-19 Response Service (CRS). This section describes the processes behind NHS 111's support of patients with Covid-19-related symptoms. It also considers the response to Covid-19 and provides a timeline of associated changes to the NHS 111 telephone service during the early months of the pandemic.

1.1 Covid-19

1.1.1 The coronavirus disease (Covid-19) is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus. For ease of reference, this report uses Covid-19 throughout to encompass both terms.

1.2 Pandemic planning

1.2.1 A report published by the National Audit Office in November 2021 titled 'The government's preparedness for the Covid-19 pandemic: lessons for government on risk management' (National Audit Office, 2021) contains information regarding the planning and preparedness for a virus such as Covid-19. Information relevant to our investigation has been included throughout this report.

1.2.2 Since 2008, the UK government's National Risk Register – which outlines the key risks that could affect the UK in the coming 2 years – has included two viral risks among the most significant emergencies that the UK could face:

- a pandemic influenza
- new and emerging infectious diseases.

1.2.3 The government's published strategies at the start of the Covid-19 pandemic were based upon existing pandemic influenza plans, before later being tailored to the new virus. Some of the changes that were made as knowledge of the virus increased are discussed later in this report.

1.2.4 In 2011, the Department of Health published a influenza pandemic preparedness strategy (Department of Health, 2011), which included lessons learnt from the H1N1 ('swine flu') virus. The following year, the Department of Health published operational guidance (Department of Health, 2012).

- 1.2.5 In 2017, NHS England published a revised 'Operating framework for managing the response to pandemic influenza' (NHS England, 2017), supplementing its overarching framework for emergency preparedness, resilience and response.
- 1.2.6 The National Audit Office (2021) report states that Public Health England (PHE) relied on pandemic influenza plans for its initial response to Covid-19. This plan included PHE maintaining processes for monitoring seasonal influenza and a telephone service that could be activated for patients to ask for antiviral medication over the phone without visiting a GP. The Pandemic Influenza Preparedness Programme Board of the Department of Health and Social Care oversaw these preparations.
- 1.2.7 As part of the contract with PHE, when Covid-19 was classified as a pandemic, the national CRS was developed. While PHE provided the contractual capability for the service via the National Pandemic Flu Service, it did not contribute to the design or delivery of the service. NHS England used various functionality made available to it through the pre-existing National Pandemic Flu Service contract and planned response to an influenza pandemic.
- 1.2.8 PHE and NHS England and NHS Improvement decided to use NHS 111 to manage the health of patients from their own homes, wherever it was possible and safe to do so, by encouraging the public to call NHS 111 rather than calling their GP or attending an emergency department. This was in line with established processes for an influenza pandemic, in which patients would call NHS 111 and, following triage using an algorithm or a remote clinical assessment, the patient would be directed to collect antiviral medication. The development of a dedicated telephone triage service for patients with Covid-19-related symptoms – the CRS – is discussed in **section 1.4**.

Core NHS 111 service

- 1.2.9 The NHS 111 service is commissioned by NHS England and run by a mix of private, social enterprise and NHS providers. The NHS 111 telephone service in England provides access to non-emergency health advice and information, 24 hours a day, 365 days a year. The service in England was launched in 2013 and aims to reduce the need for patients to seek care from other NHS services, such as a GP or hospital emergency department.
- 1.2.10 NHS Digital refers to non-clinical call handlers as 'health advisors'. This term is used throughout this report.

- 1.2.11 Calls to NHS 111 are managed by non-clinical, specially trained ‘health advisors’, who refer the patient into services based on the patient’s health needs identified during the call. The health advisors should have access to clinicians who can provide advice and guidance, or who can take over the call if the situation requires.
- 1.2.12 The health advisor uses triage software called NHS Pathways to assess the caller. NHS Pathways is an interlinked series of algorithms – or pathways – that link questions and care advice, leading to clinical endpoints (that is, decisions or actions) known as ‘dispositions’.
- 1.2.13 The system is built around a clinical hierarchy, meaning that life-threatening symptoms are assessed at the start of the call (potentially triggering an ambulance response), progressing through to symptoms that require a less urgent response (or disposition). NHS Pathways is not a diagnostic system; rather, it assesses a patient’s symptoms at the time of the call and signposts to the next level of care.
- 1.2.14 There are a number of possible responses (endpoints) that the NHS 111 service can reach. These endpoints are called dispositions. The dispositions available via NHS 111 are shown in figure 1.

- 1.2.15 The NHS Pathways system is owned by the Department for Health and Social Care (NHS Digital, 2021), commissioned by NHSX (which is now part of NHS England) and delivered by NHS Digital. The NHS Pathways team is part of NHS Digital.
- 1.2.16 NHS Pathways is a telephone and digital triage ‘clinical decision support system’ that has been used since 2005 within the urgent and emergency care setting. It is used by all NHS 111 services and half of English ambulance services. This triage system supports the remote assessment of more than 20 million callers each year.
- 1.2.17 The safety of assessments made using NHS Pathways is overseen by the National Clinical Governance Group – an independent group of clinicians from several medical Royal Colleges. The group considers all aspects of the triage process (including the impact on services), as well as the evidence for changes to the clinical content (that is, the advice given and the information on which the advice is based). All changes to, and development of, the core telephone system and other platforms are formally documented and presented for a critique to a group of experts.
- 1.2.18 NHS Pathways also ensures its clinical content and assessment protocols are consistent with the latest advice from respected organisations that guide clinical practice in the UK. This includes the latest guidelines from:
- National Institute for Health and Clinical Excellence
 - UK Resuscitation Council
 - UK Sepsis Trust.
- 1.2.19 During the early months of the pandemic, rapid changes to NHS Pathways were required as understanding of Covid-19 quickly developed. To make changes quickly, they were agreed by NHS Digital and subsequently reviewed by the National Clinical Governance Group at the earliest opportunity.
- 1.2.20 Providers of the NHS 111 telephone service are required to record all calls from the public as part of their standard contract.
- 1.2.21 On 16 March 2020 a Covid-19 pathway was introduced into the core NHS 111 services.

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
<p>You don't need to speak to anybody right now as you:</p> <ul style="list-style-type: none"> • Do not have a cough • Do not have a high temperature 	<p>'You need further assessment by NHS 111'</p> <p>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'</p>	<p>'You need to stay at home'</p> <p>'Stay away from other people for at least the next 7 days, or until your symptoms have gone'</p>

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.

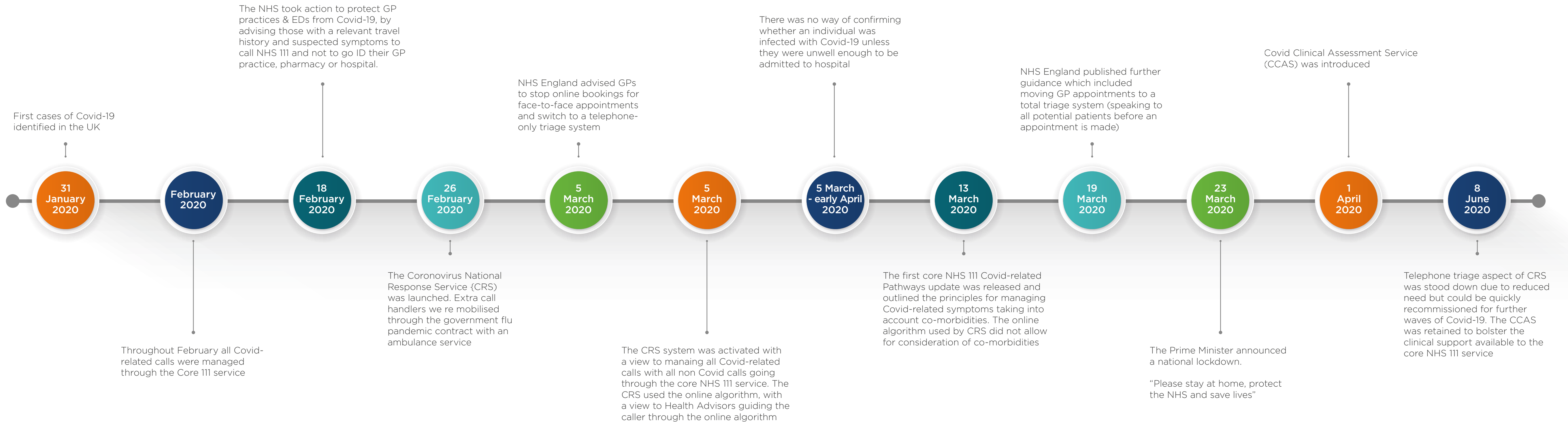
1.5 CCAS

- 1.5.1 The CCAS became operational on 1 April 2020. It was formed primarily of retired GPs returning to practice, currently practicing GPs, nurses and paramedics. They were employed to work remotely (that is, over the telephone) to provide clinical triage and assessment of calls passed to the CCAS by health advisors of the CRS if deemed necessary by the algorithm.
- 1.5.2 When clinicians work remotely, they must rely on what the patient is telling them; they cannot examine patients, run tests or see body language. Clinicians therefore use Clinical Decision Support Systems to help make a diagnosis and advise the patient (NHS England and Health Education England, 2018).
- 1.5.3 After 1 April 2020, when a health advisor determined that a caller with Covid-19-related symptoms needed a clinical assessment (by reaching a 'clinical call back' disposition on the algorithm), the health advisor would place the caller on a national Covid-19 queue for the CCAS. They would then receive a call within a predetermined timeframe based on the triaged clinical need of the patient. Before CCAS was operational, health advisors would ask the caller to hold and then would try to transfer the caller to a clinician for assessment.

1.6 NHS 111 Covid-19 timeline

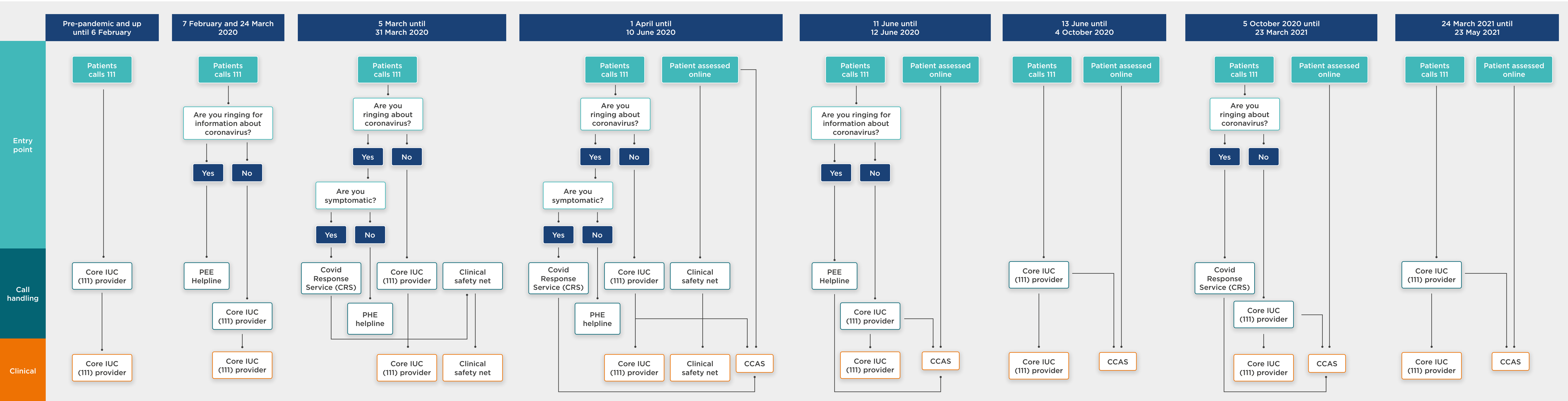
- 1.6.1 This section details some of the key dates for NHS 111 during the Covid-19 pandemic. A more detailed timeline can be viewed in **appendix A**.
- 1.6.2 Knowledge of the timeline for how the pandemic developed in England is critical to understanding NHS 111's response (**see figure 3**).

Figure 3 Timeline of national events involving NHS 111



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



2 Involvement of the Healthcare Safety Investigation Branch

This section outlines how HSIB was alerted to the issue of potential safety risks associated with NHS 111's response to callers with Covid-19-related symptoms. It also describes the criteria HSIB used to decide whether to proceed with a national investigation and the evidence-gathering tools and analysis methods used in the investigation process.

2.1 Notification of the reference event and decision to investigate

2.1.1 HSIB first identified a potential safety risk associated with NHS 111's response to callers with Covid-19-related symptoms when concerns were raised to HSIB through its Citizens' Partnership (<https://www.hsib.org.uk/who-we-are/citizens-partnership>).

2.2 Focus groups

2.2.1 The investigation held focus groups to hear the experiences of families and patients who contacted NHS 111 during the first wave of the pandemic. The investigation advertised the focus groups primarily through social media. After the events, emails were sent to all participants detailing the next stages of the investigation and outlining where they could find additional support, if required.

2.2.2 The investigation looked for themes arising from the focus groups. This was done by allocating codes to what participants told the investigation and grouping those into themes.

2.3 Reference events

2.3.1 After the focus groups, the investigation sought to identify patient safety incidents ('reference events') that were representative of the themes identified during the focus groups. The investigation chose to look at the experiences of four Patients described by participants at the focus groups. These Patients were tracked from their first call to NHS 111 with Covid-19-related symptoms until their last contact. All four reference events occurred in March and April 2020, in the early months of the pandemic. Shortly after, the CRS was put in place.

2.4 Decision to conduct a national investigation

2.4.1 On consideration of the evidence gathered from the focus groups and reference events, it was determined that the patient safety concern met the criteria for a wider investigation (see below). HSIB's Chief Investigator subsequently authorised a national investigation.

Outcome impact – what was, or is, the impact of the safety issue on people and services across the healthcare system?

The issue had the potential to impact on any member of the public who needed to access NHS 111 for Covid-19-related symptoms. It was possible that seriously unwell callers would either be unable to access timely advice or would receive advice that was inappropriate for their symptoms/comorbidities.

Systemic risk – how widespread and how common a safety issue is this across the healthcare system?

Any member of the public with Covid-19 related symptoms may need to access NHS 111 services. Media coverage at the time suggested this was a safety issue with a far-reaching impact. This was reflected by the focus groups and interviewees.

Learning potential – what is the potential for an HSIB investigation to lead to positive changes and improvements to patient safety across the healthcare system?

There was potential for an investigation to identify learnings for future occasions when a service needs to be 'stood up' in a short timeframe in response to a pandemic or other emerging illness.

2.4.2 The national investigation sought to understand:

- the set-up, design and delivery of the Covid-19 telephone triage service accessed by the public by dialling 111 in response to the pandemic
- the context and contributory factors influencing the pathway for patients dialling 111 with Covid-19-related symptoms.

2.4.3 At the outset, the investigation also sought to understand whether the ethnicity of the caller impacted on the advice provided or the experience of the caller. From the reference events, the investigation explored with the families whether they felt ethnicity impacted on the care or advice provided. While three of the four callers in the reference events

were from an ethnic minority background, none of the families felt as though ethnicity directly impacted on their experience of NHS 111. The investigation therefore did not have evidence to explore this as a term of reference, but nonetheless kept ethnicity in mind as a consideration when examining the four reference events.

2.4.4 The investigation used various sources of evidence to understand the reference events in the national context. The investigation:

- studied peer-reviewed papers
- engaged with multiple stakeholders
- engaged with service providers
- reviewed other published reports relating to Covid-19.

2.5 Investigative approach

2.5.1 The evidence-gathering phase of the investigation took place between September 2020 and December 2021. While the reference events occurred in March and April 2020, interviewees shared their experiences of the pandemic to the end of 2021. The investigation conducted further interviews with important stakeholders up to spring 2022 to clarify information.

2.5.2 The investigation was informed by:

- reviewing the Patients' clinical records relating to calls to NHS 111, where provided
- reviewing the Patients' NHS 111 audio-recordings, where provided
- reviewing relevant local and national guidance, policies and procedures
- reviewing published academic literature relevant to the safety risk
- visiting a core NHS 111 call centre.

2.5.3 In addition, formal interviews using a semi-structured approach were undertaken with:

- one Patient
- the family members of the four Patients described in the reference events
- the Covid-19 Response Service (CRS) contract manager, and senior managerial and operational staff
- health advisors for the CRS
- Private Provider 4
- the author of a serious incident report
- NHS Digital
- NHS England
- The Health Foundation.

2.5.4 Interview schedules were informed by the Systems Engineering Initiative for Patient Safety (SEIPS).

2.5.5 The use of multiple methods of analysis allowed for the triangulation of different data sources. This enabled findings to be verified from more than one source.

2.5.6 The findings were considered in the context of local and national guidance and practices either reported or evidenced in the literature. This approach, in discussion with subject matter advisors, enabled a detailed description of how the system and pathways in place at the time influenced the reference events.

2.6 Limitations

2.6.1 The investigation faced some limitations with access to information.

2.6.2 The investigation asked NHS England and NHS Improvement for data on a range of metrics, including:

- the number of callers with Covid-19 related symptoms who were managed through the core NHS 111 service rather than through the CRS

- the number and percentage of calls reaching each disposition
- the number and percentage of patients considered to have an underlying health condition who reached a 'clinical call back' disposition versus 'self-care at home' disposition.

2.6.3 While some of this data was provided after requests, the investigation identified some inaccuracies with the consolidation of the raw data. In addition, the data provided covered only the activity of the core NHS 111 service and not of the CRS. This data was available in the public domain and was not sufficiently detailed to enable the investigation to undertake an in-depth analysis.

2.6.4 Without the ability to interrogate the raw data, including CRS-specific data, the investigation had only a limited ability to cross-reference findings, and to fully appreciate the context in which the system was operating.

2.6.5 Because of the lack of data, the investigation was paused for several months. This report is therefore being published a significant time from the reference events, and much has happened in the pandemic since the early months. Nonetheless, the report offers key learnings with respect to preparedness, quickly developing and instituting a system, and the ability to flex and adapt as required.

2.7 Verification of findings

2.7.1 The findings were shared with the healthcare organisations involved in the reference events. This enabled factual accuracy and sense checking of the interpretation of information presented. Investigation findings and recommendations were presented to the stakeholder groups who contributed to the verification and design of the final recommendations. The verification of data and understanding was tested throughout the investigation process.

2.7.2 Further verification was achieved by consulting with influential national organisations and stakeholders, as detailed in table 1.

Table 1 National stakeholders engaged with during the investigation

National bodies and organisations	Individual experts and advisors
NHS England and NHS Improvement NHS Digital The Health Foundation Royal College of Emergency Medicine Public Health England* UK Health Security Agency	A conversational linguistics expert A GP with a specialist interest in patient safety An NHS 111 operational manager for a region not involved in the reference events Two acute medicine consultants A national clinical director of NHS England

* At the start of the pandemic Public Health England had – amongst others - responsibility for England-wide public health protection and infectious disease capability. The UK Health Security Agency came into being in April 2021 and took over this responsibility.

3 The focus groups and 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. During the focus groups, families described:

- delays in accessing healthcare services (NHS 111, clinical call back and ambulance)
- concerns about the initial and follow-up advice provided (that is, algorithm-driven advice from health advisors and advice given during the clinical call back)
- Paramedics reluctance to transport to hospital.

After themes had been identified from the focus groups, the investigation then sought to identify specific patient experiences that were representative of those themes. The identified Patients were tracked through the NHS 111 call system.

3.1 Patient experiences and analysis

- 3.1.1 This section sets out four Patient experiences – referred to as ‘reference events’ – and analyses of the events. In each reference event, at the time of the call to NHS 111 the Covid-19 response service (CRS) was operational. Therefore, all of the calls, in line with contractual arrangements, should have been routed through the CRS.
- 3.1.2 While some clinical detail is included, the focus of this investigation was to understand the underlying systems and processes that support health advisors and clinicians in making safe and appropriate decisions – that is, reaching appropriate dispositions – for callers with Covid-19-related symptoms.
- 3.1.3 The reference events are presented to demonstrate the experiences of families who contacted NHS 111 during the early part of the pandemic (March and April 2020). While there is overlap in the findings from the reference events, the investigation considers that each reference event demonstrates different challenges faced by the callers and by the system delivering the triage and clinical support service.
- 3.1.4 For each reference event, the families of the Patients were asked how they would like their family member to be referred to within the report. The report reflects each family’s wishes.

Vincenzo

- 3.1.5 Vincenzo was a 62-year-old man who had recently become a grandfather for the second time. He had diabetes, which his family report was well-managed. He was a keen gym-goer, and his family described him as physically fitter than he had been for many years. Vincenzo and his family went to a wedding on 14 March 2020, and 3 days later he started to feel unwell.
- 3.1.6 Vincenzo and his family called NHS 111 on 17, 18, 19, 22, 23 and 26 March. The available data did not show how long the family waited on the phone before either giving up or speaking to an advisor about Vincenzo's symptoms, but his family told the investigation they experienced long delays. Table 2 documents the calls Vincenzo or his family made to NHS 111 according to the CRS contract manager. In the context of the table, 'not delivered' means the call was not connected to a health advisor, but it may or may not have been routed from the interactive voice response (IVR) through to a particular call-handling service (ambulance service or private provider).

Table 2 Dates, times and outcomes of the phone calls made by Vincenzo or his family, and the service provider involved

Date	Time	Outcome	Health advisor
17 March 2020	11:06:14 hours	Not delivered	
18 March 2020	12:03:27 hours	Not delivered	Ambulance Service A
19 March 2020	17:13:37 hours	Not delivered	
19 March 2020	17:14:36 hours	Not delivered	
19 March 2020	17:24:23 hours	Delivered	Ambulance Service A
22 March 2020	10:21:48 hours	Not delivered	Ambulance Service A
22 March 2020	10:27:58 hours	Delivered	Private Provider 4
23 March 2020	10:44:23 hours	Delivered	Private Provider 5
26 March 2020	15:04:05 hours	Not delivered	

- 3.1.7 Data from the CRS contract manager suggests that the calls to NHS 111 on 17 and 18 March went unanswered. On 19 March (3 days after a Covid-19 pathway was introduced into the core NHS 111 services) Vincenzo again tried to call NHS 111. Two calls were unanswered; the third call was answered and was routed through the core NHS 111 service provided by Ambulance Service A.
- 3.1.8 At this stage, Vincenzo had a fever and was not eating. His family report that Vincenzo told the health advisor that he was diabetic, and that at the end of the call he was advised to take paracetamol and stay at home.
- 3.1.9 Ambulance Service A was unable to locate any records for this call. Ambulance Service A told the investigation that a possible explanation for being unable to locate the call record is as follows:
- “If, whilst waiting to speak to an agent, the caller opts to end the call then there will not be a call recording for the call. This is because the recording system can only start when the call is answered by an agent ... in the absence of being able to locate a call recording we will have to assume that this is what has happened, and the caller did not speak to anyone ...”
- 3.1.10 However, Vincenzo’s family are adamant that he spoke to someone on this occasion and was advised to remain at home. The family told the investigation that they were very worried about the impact that Vincenzo not eating would have on his blood sugar levels (with respect to his diabetes) and were keen to get medical advice.
- 3.1.11 Evidence provided by Private Provider 4 shows that Vincenzo’s second answered call, on 22 March, was connected to a core NHS 111 service health advisor at 10:27 hours and that Vincenzo received a call back from a clinician (within the core NHS 111 service) at 11:23 hours. A clinical call back within an hour suggests that he had been classified as having an urgent need for clinical review. However, the health advisor’s referral was not available for the investigation to view because it was not saved, and the call was not recorded.
- 3.1.12 Private Provider 4 told the investigation that audio-recording had not been set up on the telephone extension on which the call came through. The telephone extension had been set up as an overflow to aid Covid-19 social distancing, but had not been configured to record. Private Provider 4 told the investigation that the issue with the telephone extension was identified and resolved by 19 May 2020.

- 3.1.13 The CRS contract manager told the investigation that in the early days of the CRS (March–April 2020), calls were not always recorded as recording was not specifically required in service providers' contracts. This was to help expedite the set-up and delivery of the CRS. However, Vincenzo's call on 22 March went through the core NHS 111 service, and therefore recording was contractually required.
- 3.1.14 The outcome of the clinical assessment was that Vincenzo should continue with self-care at home and to call his GP if his condition deteriorated. However, when Vincenzo's family phoned his GP, they were advised to contact NHS 111.
- 3.1.15 Based on what the investigation had been told about the development of the CRS to manage all Covid-19-related calls, the investigation was expecting to find that Vincenzo's calls were managed through the CRS. However, of the three calls that were connected to a health advisor (including the third call described below), all went through core NHS 111 providers, despite the family being adamant they selected the option for Covid-19 support.
- 3.1.16 The next call made by Vincenzo's family was on 23 March and was again managed through the core NHS 111 service, this time by Private Provider 5. Private Provider 5 told the investigation that Vincenzo's son made the call and discussed his own health and that of his mother (they both had severe Covid-19 related symptoms by this point; Vincenzo's son was also diabetic). Private Provider 5 told the investigation that the only reference to Vincenzo during the call was Vincenzo's son stating that his father was also unwell with Covid-19.
- 3.1.17 The family said that on several occasions they tried to discuss all family members' symptoms during the call. However, health advisors informed them that only two people could be discussed per call and that additional household members would have to call back to discuss their symptoms. The family believe that, with the long wait to get through to an NHS 111 health advisor, only being able to discuss two patients per call impacted on their ability to get further medical advice for Vincenzo. The CRS contract manager told the investigation that there was no limit to the number of patients that could be discussed on a call – only that each patient was assessed in turn because the algorithm could not assess multiple patients at the same time. The health advisor would therefore need to start a new assessment for each caller and the CRS contract manager suggested that it would be best for each caller to call individually. NHS Digital confirmed that NHS 111 core services would also be able to manage a household through one call – with each person being assessed in turn and reaching an outcome before the next assessment could start.

- 3.1.18 The family tried to call NHS 111 at 15:04 hours on 26 March 2020, but the call was not connected. The family were very concerned about how grey Vincenzo looked. He was also short of breath and experiencing chest pain on inhalation. The family told the investigation they were frustrated at 111 calls going unanswered and/or being unhelpful which prompted the family to call 999. His wife called 999 at 15:08 hours and the ambulance request was received at 15:19 hours. An ambulance was immediately mobilised and was at Vincenzo’s home at 15:33 hours. Paramedics were by his side a minute later.
- 3.1.19 At 15:34 hours the paramedics recorded Vincenzo’s observations (see table 3). Observations were repeated 30 minutes later, with no change in the results.

Table 3 Vincenzo’s observations

Observation category	Reading	Expected range
Respiratory rate	28 breaths per minute	12-16 breaths per minute
Blood oxygen saturation	94%	>95%
Temperature	38.8°C	36.5-37.5°C
Heart rate	104 beats per minute	60-100 beats per minute

- 3.1.20 The ambulance clinical records describe Vincenzo as having a history of shortness of breath with Covid-19. He had a Glasgow Coma Score of 15, which meant he was fully alert and responsive. He complained of shortness of breath, a raised temperature and pain. Vincenzo had had a cough for the past few days. Vincenzo was recorded as being diabetic. On examination by the paramedics, he had a rapid regular increased respiratory rate and was unable to speak in full sentences.
- 3.1.21 The family told the investigation that the paramedics said Vincenzo’s oxygen saturation levels were “borderline” and that they had seen “13 far sicker patients that day already”. The family consider that this made the paramedics hesitate as to whether Vincenzo needed to be taken to hospital. The family said they and Vincenzo continually asked for Vincenzo to be taken to hospital for treatment. The paramedics agreed to take him, leaving his home at 16:25 hours, just over 50 minutes after arrival. The investigation only has the paramedics’ notes and was unable to interview the paramedics involved.

- 3.1.22 Vincenzo died in hospital 6 days later, on 1 April 2020, of Covid-19. The investigation did not evaluate the care and treatment provided to Vincenzo once in hospital, as this was outside the scope of the investigation. However, the emergency department notes indicate that Vincenzo was acutely unwell when he was admitted to hospital.
- 3.1.23 Vincenzo’s story demonstrates the potential limitations of a remote assessment. While a thorough assessment can be undertaken over the telephone, the person performing the assessment is reliant upon the information provided to them by the caller, their own ability to elicit salient information and their listening skills, which can, for example, assess a patient’s rate of breathing for example.
- 3.1.24 The paramedic review also indicates the severity of illness required for a hospital admission during the early stage of the pandemic. This is discussed in **section 4**.

Ali

- 3.1.25 Ali was a 66-year-old grandfather of two. He had diabetes and hypertension, which meant he was at moderate or greater risk of complications from Covid-19. Ali’s family said he had had a cough for 3 weeks, but only became unwell on 6 April 2020.
- 3.1.26 Ali, and his wife calling on his behalf, made three calls to NHS 111 between 6 and 9 April 2020. They were concerned about his worsening cough and lethargy, particularly because of his diabetes. Although the CRS was in place at that time, all calls were delivered through the core NHS 111 service. The family told the investigation they selected the option for Covid-19 support on each occasion.
- 3.1.27 The first call with a health advisor resulted in a clinical call back (received after 12 hours). The clinician carried out a clinical assessment and advised hydration and regular paracetamol (this was standard advice included in the algorithms and online given to all Covid-19 callers).
- 3.1.28 The second call to NHS 111 (2 days later) resulted in the health advisor again reaching a clinical call back disposition. Ali received a clinical call back (through Private Provider 4) 6 hours later, and the clinician advised him to “stop blood pressure tablets”. Ali was also started on an antibiotic. The clinician did not arrange for a face-to-face assessment.
- 3.1.29 On 9 April 2020, the third call resulted in the health advisor reaching a ‘category 3 ambulance disposition requiring ambulance validation’, which resulted in a clinician calling Ali. The clinician decided that further home-

management advice was appropriate, rather than an ambulance. Later that day, Ali collapsed and his wife called 999. An ambulance was dispatched, and Ali was declared dead by the paramedics on arrival. His cause of death was recorded as acute respiratory symptoms, leading to a cardiac arrest, as a result of Covid-19.

3.1.30 Following Ali's death, Private Provider 4 undertook a serious incident investigation. This identified learnings relating to one of the remote clinical assessments and the safety-netting advice given to Ali. The clinician stated that his assessment was made within the context of assessing many patients with respiratory symptoms at that point of the pandemic. In **section 4**, the investigation discusses how, within the context of the pandemic, clinicians' perceptions of severity of illness may have changed to reflect the adjusted risk tolerance within the wider system.

3.1.31 The investigation retrieved audio-recordings of the clinical calls. Two subject matter advisors – a GP with a special interest in patient safety and a conversational linguistics expert – were asked to analyse the audio-recordings.

3.1.32 The GP concluded that the design of the system may have resulted in the clinician being unable to appreciate how unwell Ali was, resulting in a lack of action to prevent his further deterioration. At the end of the clinical calls, there was an emphasis on safety netting. However, when Ali and his wife called back, the response was not proportionately escalated until the last call, when the ambulance response was cancelled.

3.1.33 The conversational linguistics expert provided the following opinion:

“The idea behind an assessment is to do triage, to try to establish whether the patient should stay at home, talk to a clinician (within a certain time frame), or whether an ambulance needs to be sent. To make this determination, the 111 health advisor asks a series of questions. Based on the answers given by the patient and the script, the algorithm generates a disposition which the health advisors shares with the caller. It should not matter for the patient which health advisors they have.

It is therefore crucial that the patient can answer the questions adequately, in a way that fits the script and therefore helps the health advisor input the answers to generate a disposition.

In the recording of Ali engaging with the health advisor, it appears that the way in which questions are framed can sometimes be problematic, meaning that the patient does not understand the question, and does not know how

to answer it. For example, the question around whether the patient has been diagnosed with a condition where an infection could be serious – this is a question Ali has trouble answering.

This appears to be a difficulty understanding how the sequence (meaning the exchange of turns) unfolds. The health advisor asks the question, but instead of giving a definitive answer, the patient says he does not know. The health advisor then tries to help the patient get to a yes/no answer by giving examples of these conditions, and that helps the patient then answer the question. The health advisor cannot move on to the next question until they are able to answer the one they are asking even if the answer to that is ‘not sure’. This is what happens in the first call:

Health advisor: Have you been diagnosed, with a condition, where an infection, might be very serious?

Ali: Uh (pff pf pf) uh p-possible uh yeah I don't know, what to say.

On one level these questions are difficult, because the patient cannot answer them immediately. However, by giving clarification or examples, Ali was able to provide an answer. Other examples are the question of whether Ali is confused or is breathless, the latter being an issue for Ali.

In the fourth call, when Ali sounds breathless and not well, he is struggling to answer questions in general. It does not appear to be an issue with understanding, more that he is too sick to have a conversation and answer questions. Even questions that he had no problem answering in earlier calls become difficult. Ali does not answer the questions, but instead of showing he does not understand or cannot comprehend, he responds with something like ‘sorry’. And instead of explaining, the health advisor repeats the question or the part of the question that Ali seemingly didn't seem to have heard:

Health advisor: Just to confirm, so what symptoms have you been having?

Ali: Sorry

Health advisor: What symptoms are you getting?

Ali: Well uh I'm feeling weak.

Health advisor: Mm hm?

The health advisor rephrases, but essentially repeats the same question. This also happens in the earlier calls, but it happens with nearly every question in the last call. Starting after the first few questions, the health advisor needs to repeat every single question. Towards the end, Ali starts saying 'I don't know,' however, by this point, it seems clear that Ali is not well enough to answer, and the health advisor asks if they can talk to his wife."

3.1.34 The investigation identified two potential problems with the remote assessment in this reference event:

- Ali may not have understood the question. Ali's family questioned whether health advisors are trained to manage the differences in language used by ethnic minorities.
- Ali was too unwell to answer the question.

3.1.35 In the last call Ali made to NHS 111, it was apparent that he was too unwell to answer questions. In this reference event, Ali's wife could give a clear history and shared her concerns about her husband's condition. However, this raises questions about how such a situation could be managed if the patient was alone.

Patrick

3.1.36 Patrick was a 60-year-old deputy ward manager with multiple sclerosis. He was working on a designated Covid-19 ward at his trust, from which he was sent home on 2 April 2020 after developing a cough. He tested positive for Covid-19 on 4 April and isolated at home. His partner told the investigation he had a high temperature and contacted NHS 111 for advice.

3.1.37 Patrick made three calls to NHS 111 between 7 and 10 April 2020. His partner said that on the first two occasions (both on 7 April) Patrick was advised to remain at home and self-care. Three days later, Patrick made a third call to NHS 111. His partner told the investigation that, despite his condition deteriorating, he was told that he no longer needed to isolate because of the length of time he had been unwell and to continue with self-care.

3.1.38 Patrick's first call was managed by a core NHS 111 service provider (Private Provider 6) and the other two calls by a CRS provider (Private Provider 1). Neither provider supplied recordings of Patrick's calls.

3.1.39 The call durations were provided by the CRS contract manager (**see table 4**).

Table 4 Duration of Patrick’s calls to NHS 111/CRS

Date	Time	Duration	Disposition	Provider
7 April 2020	14:50:24 hours	11 minutes	Delivered	Private Provider 6
7 April 2020	16:25:17 hours	8 minutes	Delivered	Private Provider 1
10 April 2020	15:40:21 hours	8 minutes	Delivered	Private Provider 1

3.1.40 Patrick’s condition deteriorated further and on 11 April 2020 he contacted a nurse colleague for advice. He was told to call an ambulance immediately, which he did. He was taken to hospital and put on a ventilator. He died 8 days later, on 19 April 2020, due to Covid-19.

3.1.41 The CRS contract manager told the investigation that calls show as being ‘delivered’ to a service while a caller is still waiting to be connected to a health advisor. The CRS contract manager was advised by Private Provider 6 that, due to significant demands on the service, there had been long wait times for calls in April 2020 and that the call may have been abandoned.

3.1.42 Similarly, Private Provider 1 was unable to locate any evidence that Patrick spoke to a health advisor on 10 April 2020. The CRS contract manager was therefore unable to confirm whether Patrick spoke with a health advisor from Private Provider 1 on 7 and 10 April 2020.

3.1.43 Patrick’s partner clearly recalls that Patrick spoke with NHS 111 on three occasions and he was present for the call on 10 April 2020. The investigation was unable to analyse the calls as no audio-recording evidence was available.

Dr C

3.1.44 Dr C was a 45-year-old man with type 2 diabetes. He made three calls to NHS 111 between 16 and 17 March 2020 regarding his Covid-19 related symptoms, and then called 999 on 18 March 2020 as his condition deteriorated. He had experienced a cough, fever and shortness of breath for several days.

3.1.45 The first call, at 09:15 hours on 16 March 2020, was routed through the CRS and records show it was delivered to Private Provider 2. The investigation was told that no recording of the call could be located but was later provided.

- 3.1.46 On 17 March, Dr C called NHS 111 at 11:17 hours. The call was again routed through the CRS and was answered by Private Provider 2. Dr C told the health advisor he had been waiting to be put through to a clinician but had not managed to get through, and asked if the health advisor could try again.
- 3.1.47 The investigation listened to the audio recording, in which the health advisor asked Dr C some questions relating to his symptoms, the history of those symptoms and if he had been self-isolating. Dr C told the health advisor, “So I’ve had it for 5 days. It seems to have gotten a little bit worse yesterday. I now have a shortness of breath, I’ve had a fever last night and just general fatigue.”
- 3.1.48 The health advisor told Dr C he would be put through for medical advice, that the waiting time could be up to 40 minutes, and that if he did not get through the health advisor would return and give Dr C other options.
- 3.1.49 The duration of this first part of the call was 2 minutes and 30 seconds. Dr C and the health advisor were on hold for 20 minutes and 5 seconds before the health advisor returned to the call.
- 3.1.50 On their return, the health advisor said to Dr C: “Unfortunately it’s really really busy. I’m not sure if they are going to pick up so what you can do if you dial again 119 choose option 9 then option 2, then it will put you through to a medical advisor, ok.” Dr C thanked the agent and the call ended.
- 3.1.51 It appears that on this occasion, the call was not managed in line with the standard script. The health advisor did not establish why Dr C was waiting to be transferred to a clinician. The agent then tried to re-transfer Dr C to a clinician, but after a long wait directed Dr C to call the 119 service (which gives non-clinical advice about Covid-19 vaccination and testing). Directing the caller to 119 was outside of the standard process.
- 3.1.52 The CRS contract manager told the investigation that at the time of this call, every caller was supposed to be assessed using the paper algorithm assessment booklet and then inform the caller of the appropriate outcome/disposition reached based on the information shared.
- 3.1.53 It is not known whether Dr C dialled 119 and was told to call 111 but later that morning, at 11:40 hours, Dr C’s partner dialled 111 on behalf of Dr C. This time the call was routed through the core NHS 111 service and was answered by Ambulance Service B.

- 3.1.54 Dr C's partner told the health advisor that they had "called several times and ... were supposed to be put through to the clinician". Several minutes were spent trying to confirm the Patient's name and address, as there were issues over the registered home address being different to their current location.
- 3.1.55 The recording ends just as Dr C's partner is giving the health advisor his mobile phone number, so the investigation was unable to confirm what was said in the rest of the call. However, it can be assumed that the health advisor reached a clinical call back disposition as Dr C received a call from a clinician later that day.
- 3.1.56 The subject matter advisor to the investigation listened to the recording of the call between Dr C and the clinician. The advisor commented that Dr C could be heard coughing throughout the call, but was able to talk in complete sentences. Dr C told the clinician, "We think we have coronavirus." The clinician's notes do not include this, but do record that Dr C had not travelled abroad and that he had not been in contact with any people with confirmed Covid-19. The clinician's questions did not include considerations around community transmission of Covid-19. Dr C told the clinician that, shortly before becoming unwell, he had attended choir practice and that other attendees had also become ill.
- 3.1.57 The investigation's subject matter advisor suggested that because the clinician did not hear or understand Dr C's concern that he had Covid-19, the clinician did not manage this Dr C as having suspected Covid-19. They recorded "chest infection" as their final diagnosis.
- 3.1.58 There was no community testing at this stage in the pandemic, so for most people a Covid-19 diagnosis was unconfirmed. Therefore, asking Dr C about whether he had been in contact with people with confirmed Covid-19 – and the lack of this contact – did not rule out the possibility that he might be infected. However, the investigation acknowledges that this questioning was in line with expected practice at that time.
- 3.1.59 Dr C described Covid-19 related symptoms of a dry cough, fever, fatigue and muscle aches. The clinician asked whether Dr C felt "hot/cold/shaky" and he responded that he did. Dr C later said that his "fever is getting worse". The clinician documented "Temperature?? – getting worse, temperature is worse."
- 3.1.60 Dr C stated that he was deteriorating. He explained that, "[My partner is] getting better and I seem to have gotten a bit worse in the last few days and I am also a diabetic ... Last night I got quite a lot worse basically." The opinion of the investigation's subject matter advisor is that the deterioration described indicates a face-to-face assessment may have been beneficial.



- 3.1.61 Dr C also described being unable to sleep as he “couldn’t breathe properly”. The clinician asked whether there was any situation where he had to fight for breath. Dr C said: “I think I would say my breath is sometimes laboured, but I don’t think I would say/describe it as I have to fight for my breath.” The opinion of the investigation’s subject matter advisor was that if the patient is not “fighting for breath”, it does not mean that they are not very unwell.
- 3.1.62 Having worsening, laboured breathing, as Dr C described, is a concerning symptom and would normally warrant either an emergency response or an urgent face-to-face assessment. However, Covid-19-specific guidance relating to ‘red flags’ was not widely introduced until 19 March, the day after Dr C’s assessment (Royal College of General Practitioners, 2020). The clinician responded “That’s good” and documented: “No difficulties in breathing.” There is a disparity here in what was recorded in the notes and what was discussed more broadly. This may have been influenced by Dr C being able to speak over the phone in full sentences, as the clinician remarked: “You don’t sound like you’re short of breath.”
- 3.1.63 Dr C described another concerning symptoms, saying his “hands get really cold”. Cold hands and feet are a red flag for sepsis in children and should raise concerns in adults. Dr C also said that his “chest feels heavy”.
- 3.1.64 The clinician was thorough in their history taking and safety netted in line with expected standards. However, the call is confusing as the clinician told Dr C: “Any breathing problems, call 999.” This was despite Dr C describing a history of worsening breathlessness with laboured breathing when he tried to sleep. The clinician documented “No red flags” but, as described above, Dr C reported symptoms that could be considered concerning and that may have warranted a face-to-face assessment.
- 3.1.65 The clinician prescribed an inhaler and antibiotics. They provided Dr C with home management and safety-netting advice, telling him to call 999 if he has any breathing problems.
- 3.1.66 On 18 March at 19:31 hours, Dr C’s partner called 999. He was desperate to get urgent treatment for Dr C and, when he was advised that an ambulance may take some time, offered to drive Dr C to the hospital. However, he was concerned that, if Dr C did have Covid-19, he would risk exposing others. The 999 health advisor agreed and advised him to wait for the ambulance. An ambulance was dispatched at 20:33 hours and arrived at Dr C’s home at 21:13 hours. He was assessed and taken to hospital, arriving at 21:58 hours. He died 16 days later, on 3 April, of Covid-19.

- 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 suggest 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.

3.3 Calls not recorded

- 3.3.1 In two of the four reference events, calls to NHS 111 were not recorded as per contractual arrangements.
- 3.3.2 The investigation found it difficult to access audio-recordings of the calls from the reference events. The CRS contract manager told the investigation that all calls to the CRS were required to be recorded, and only one provider was identified as not recording calls. This was rectified on 7 April 2020. The provider had not activated the recording functionality, as it had assumed the contract requirement was the same as for the National Pandemic Flu Service (NPFS). The investigation learnt that contracts for NPFS have an option to record calls, but this is set to 'not record calls' as default, with switching to 'record calls' attracting an additional cost. Despite this, call recordings of the reference events were not readily available to the investigation.
- 3.3.3 A number of calls the investigation tried to access went through core NHS 111 services, not the CRS. These calls were not recorded or recordings could not be located. The investigation was given a variety of reasons for this, including the rapid expansion of services which meant that some new locations did not have the ability to record. The investigation was also told that some clinicians did not know how to enable the call-record function when undertaking remote clinical assessment.
- 3.3.4 While calls not being recorded was unlikely to have had a direct clinical impact on the callers contacting NHS 111 with Covid-19-related symptoms, it does impact on the services' ability to ensure the quality and safety of the interactions between callers and health advisors, and of the clinical advice being provided during clinical call backs. Without this monitoring, there are fewer opportunities to learn and identify where safety can be improved within the system.

3.4 Delays getting through to NHS 111

- 3.4.1 During the focus groups and interviews with the families of the Patients in the reference events, one of the main concerns raised was the difficulty in getting through to NHS 111 for medical advice. Given that the public was being advised not to contact their GP, families reported feeling "abandoned" when they could not get through to NHS 111.
- 3.4.2 In all of the reference events, families experienced long delays in getting through to an NHS 111 health advisor. Families described giving up on calls before they were connected and being cut off before they could speak with a health advisor.



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 interpreted information with the Health Advisor. These included English not being the callers first language and a caller who was neurodivergent.

3.6 Home-management advice

- 3.6.1 The investigation's conversational linguistics expert considered, from the calls they heard, that the algorithm and clinical assessment had a strong emphasis on resting and home remedies. While this was likely to be appropriate advice for most callers, the difficulty is in ensuring the system can quickly respond as knowledge of a virus improves. This is discussed in greater detail in **section 4**.

3.7 Summary

- 3.7.1 In summary, the evidence provided by families suggests a disconnect between what the CRS system set out to do and what was delivered to callers. The investigation acknowledges that the CRS system was put into place at incredibly short notice and that there were many unknowns at the start of the pandemic. In the next section, the investigation seeks to understand the system at a wider level and to identify changes that may help to better manage any future pandemics or large scale healthcare crises.

4 Analysis and findings – the wider investigation

This section describes the analysis and findings of the wider national investigation. The areas explored at a national level were identified from the evidence and findings of the reference events. The focus of this section is not only on reflecting on past events, but also on looking at how similar healthcare systems can be mobilised in the future.

4.1 System demand and delivery

System demand

- 4.1.1 In the early stages of the Covid-19 pandemic, the message from the government was to “Stay at home to protect the NHS.” On 12 March 2020, Prime Minister said: “I urge people, who think in view of what we’re saying about their potential symptoms that they should stay at home, not to call 111 but to use the internet for information if they can” (Prime Minister’s Office, 2020).
- 4.1.2 On 16 March 2020, the Prime Minister said during a televised broadcast:
- “... It goes without saying, we should all only use the NHS when we really need to. And please go online rather than ringing NHS 111.”
- 4.1.3 Despite this, the demand on the NHS 111 system increased. The weekly number of NHS 111 calls rose from around 300,000–350,000 to 800,000 during March 2020 (NHS England and NHS Improvement, 2020). This increase coincided with the closing of GP surgeries to reduce the spread of Covid-19.
- 4.1.4 The public message was reinforced through the NHS 111 script to callers who were given a self-care at home disposition. They were advised: “In the current situation the NHS needs the problem to be managed at home.”
- 4.1.5 The investigation learnt through the focus groups and reference events that this strong messaging resulted in some people being reluctant to contact NHS 111 or to re-contact NHS 111 if their condition deteriorated.
- 4.1.6 There was strong messaging for the general public to stay at home to protect NHS services. However, the government advice on what people should do or be aware of while at home was limited. In particular, there was limited information on managing self-care at home and the symptoms to watch for, particularly in those with complex needs or receiving a positive Covid-19 test result.

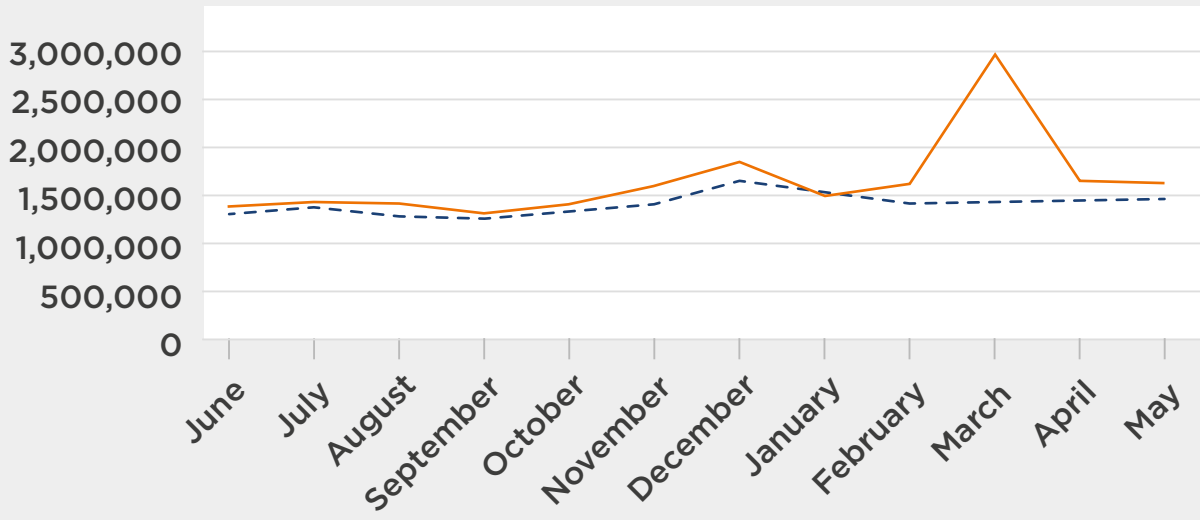
4.1.7 As described in **section 3**, members of the focus groups and the families involved in the reference events reported delays in getting through to NHS 111. Data from NHS England analysed by (The Health Foundation, 2020) suggests a significant increase in calls to NHS 111 in March 2020. However, this was not matched by capacity. Of approximately 3 million calls that were received in March 2020, only around half were answered (**see figure 5**). The Covid-19 Response Service (CRS) contract manager told the investigation that the level of demand was substantially higher than predicted, and that this affected the service's ability to answer calls in a timely way.

Figure 5 Proportion of NHS 111 calls received and answered in March 2020

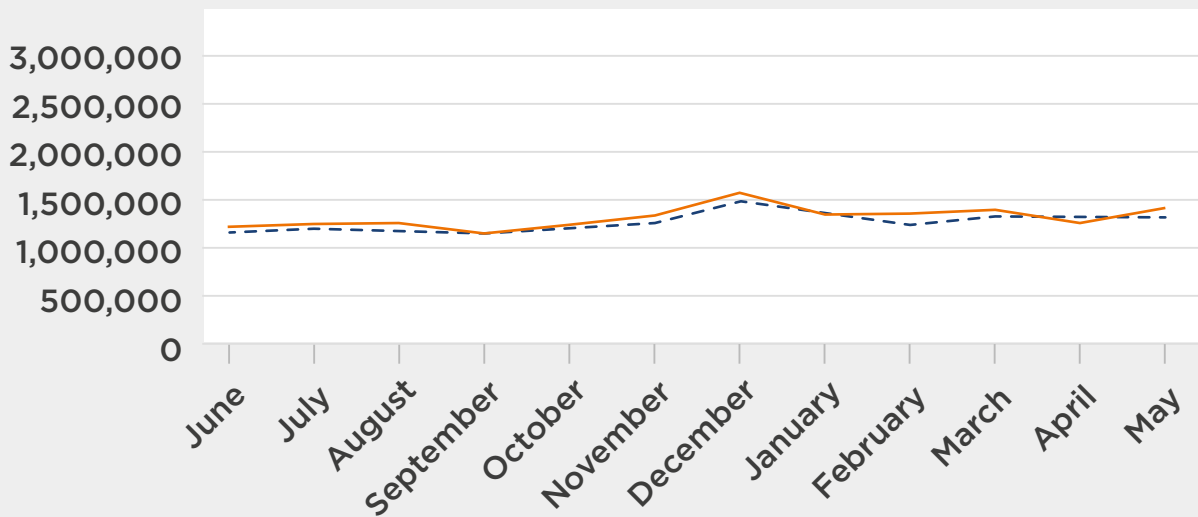
Key

- 2019/20
- - - 2018/19

Total calls received



Total calls answered



- 4.1.8 The pace at which the CRS was required to be scaled-up and operational, combined with public messaging to contact NHS 111 rather than their GP (and GP surgeries being essentially closed) impacted on the service's ability to answer calls.
- 4.1.9 The Health Foundation (2020) reports that the advice given to callers to NHS 111 in March 2020 was different to that given in March 2019, with almost 130,000 more callers recorded as 'not recommended to attend other service' (essentially a self-care at home disposition). This represented a 75% increase on 2019.
- 4.1.10 Over 90,000 more callers were recommended to 'attend other service', which could include community nursing. This represented an 132% increase compared with March 2019.
- 4.1.11 There was strong messaging around patients staying at home if they reached a self-care at home disposition. For some callers, as identified in focus groups, this discouraged them from recontacting NHS 111 or seeking medical advice from elsewhere even if their condition deteriorated.

HSIB therefore makes the following safety observation

Safety observation O/2022/190:

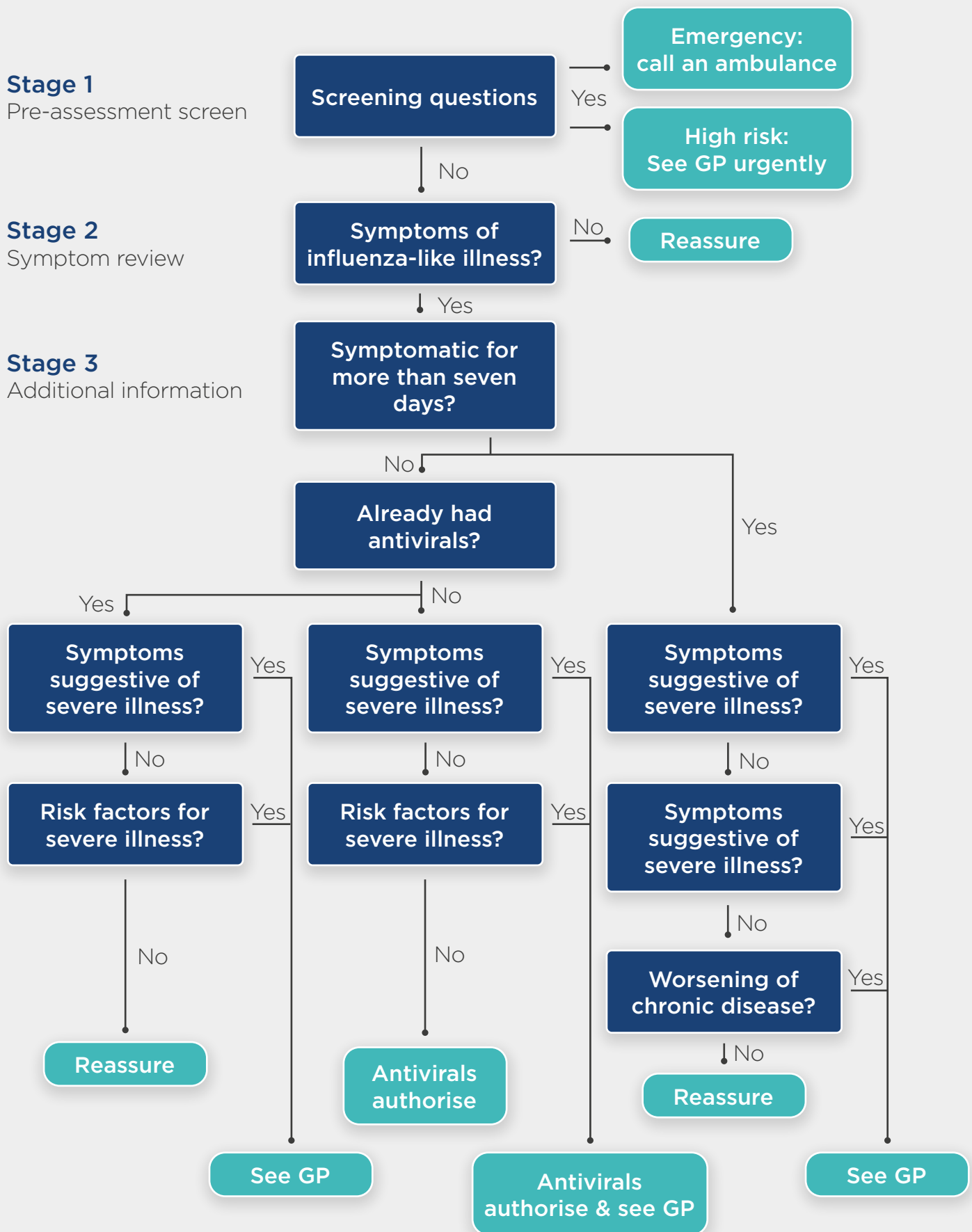
It may be beneficial to review triage software and safety-netting/worsening advice to ensure the language used by health advisors does not deter seriously unwell people from calling back or seeking medical advice if necessary.

System delivery

- 4.1.12 The investigation learnt that a decision was made to access the functionality and capability that was part of the dormant influenza pandemic contract in response to the Covid-19 pandemic.
- 4.1.13 The National Pandemic Flu Service (NPFS), as described by NHS Digital in March 2019, was designed to supplement the response of primary care providers during an influenza pandemic. According to the NPFS, if pressures mean that it is no longer practical for all those with symptoms to be individually assessed by a doctor or other healthcare professional, patients can triage themselves to access antiviral medicines (NHS Digital, 2019). The CRS contract manager told the investigation that they used infrastructure from NHS Digital as it provided the online assessment tool for 111.

- 4.1.14 The NPFS comprises an online and telephone-based self-assessment service. Individuals are not assessed by a clinician, but instead answer questions that were developed by national clinical bodies (**see figure 6**). These determine whether the person who is unwell is eligible for an antiviral medicine or not. Individuals may also be directed to other health interventions, such as self-care advice at home or referral to the emergency services for an ambulance response (**see figure 6**).
- 4.1.15 The NPFS was activated on 23 July 2009 in response to the H1N1 ('swine flu') pandemic, operated for 204 days and assessed 2.7 million patients (equating to 5,200 consultations per 100,000 population). This was six times the number of people who consulted their GP with an influenza-like illness during the same period (823 consultations per 100,000 population) (Rutter, Mytton, Ellis, & Donaldson, 2014).

Figure 6 Algorithm for use during an influenza pandemic



- 4.1.16 While Covid-19 is not influenza, a ‘memorandum of understanding’ between Public Health England (PHE) and the CRS contract holder enabled some specific functions to be mobilised to manage the Covid-19 outbreak – including setting up a telephone system to manage large call volumes. The CRS contract manager was a partner in delivering the service, alongside PHE and NHS England. The contract included a plan for private provider subcontractors to bolster the resources of the core NHS 111 service.
- 4.1.17 The investigation was told that the decision to put into effect services as per the NPFS came from discussions around the increasing demand on NHS 111, primary care and hospital emergency departments. NHS England and NHS Improvement told the investigation that, in late February/early March 2020, it began considering its options around incident response. The UK Health Security Agency (which absorbed some of the responsibilities and functions of PHE when it became into being in April 2021. It became fully operational on 1 October 2021) told the investigation that the NPFS was incredibly flexible and allowed for a range of services to be activated and adapted as required.
- 4.1.18 NHS England and NHS Improvement told the investigation that it had to determine the best way for the public to contact the NHS for:
- assessment of symptoms
 - public health information.
- 4.1.19 NHS England and NHS Improvement told the investigation that lessons from the H1N1 (swine flu) epidemic in 2009 indicated that telephone services should be managed by NHS 111. It was felt that the scalability of NHS 111 (that is, the ability to rapidly increase its capacity for calls) and accessibility provided the opportunity for a swift response.
- 4.1.20 NHS England and NHS Improvement said that alternative options for contacting the NHS were considered, such as through GPs. However, this ran the risk of nosocomial transmission (that is, becoming infected in a healthcare setting) through face-to-face appointments. In addition, primary care was not considered to have the required capacity or scalability compared with a telephone service.
- 4.1.21 The intent of the NHS 111 telephone triage system was to manage the health of patients from their own homes, wherever it was possible and safe to do so, by encouraging the public to call NHS 111 rather than calling their GP or attending an emergency department.

- 4.1.22 At the start of the pandemic, the aim was to develop a Covid-19 telephone triage service in which patients/callers were walked through an online assessment. This would enable the core NHS 111 service to continue triaging callers with non-Covid-19 concerns and also divert patients with Covid-19 related symptoms away from primary care, thus relieving pressure on GPs and reducing the likelihood of patients presenting at primary care settings and therefore risking further spread of the virus.
- 4.1.23 The plan was that anyone calling 111 with concerns relating to Covid-19 would have a Covid-19-specific assessment. The CRS algorithm did not allow for Health Advisors to ask about comorbidities when guiding the caller through the algorithm. Callers would only be transferred to a clinician/receive a clinical call back if they answered 'yes' to the algorithm generated question that asked whether they were "so ill that ...[they've] stopped doing all of ... [their] usual daily activities".
- 4.1.24 The CRS was implemented as part of a 21-day mobilisation plan. This meant that, within 21 days, call centres had to be established and health advisors recruited and trained. NHS England and NHS Improvement told the investigation that it decided what IT infrastructure to use, but that the New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG) – which advises the government on the threats posed by new and emerging respiratory viruses – decided on the content of the patient assessment algorithm. They continued to make all decisions about which primary symptoms should be included in the algorithm and how they would affect the patient pathway.
- 4.1.25 As part of the response to the Covid-19 pandemic, the CRS contract manager introduced a range of national services including the CRS, the Covid Clinical Safety Netting Service and, from 1 April 2020, the Covid-19 Clinical Assessment Service (CCAS).
- 4.1.26 An algorithm to check for Covid-19 related symptoms was developed by NHS Digital (NHS Digital, 2020) for the public to use at home. NHS 111 CRS health advisors would run through the same algorithm with callers. The health advisor would reach the same disposition as a member of the public completing the algorithm online.
- 4.1.27 During the first Covid-19 peak in spring 2020, more than 1.2 million Covid-19-related calls were received by the services delivered by the CRS contract manager, including the CRS.
- 4.1.28 The first CRS call centre was operational within the first week of the mobilisation plan, and other sites and services were introduced in the following weeks. Nearly 6,000 health advisors were recruited to the CRS through contracts with private companies.



- 4.1.29 The CRS contract manager told the investigation that the CRS used qualified trainers to support and deliver training to CRS health advisors. The trainers were core NHS 111 trained staff who, in normal business, were qualified to deliver training in assessing patients remotely. NHS Digital is responsible for the training materials used in core NHS 111 services.
- 4.1.30 The CRS contract manager told the investigation that, in line with their responsibilities, CRS health advisors were not trained to use and did not have access to the NHS Pathways telephone triage software used by core NHS 111 health advisors. Instead, CRS health advisors received tailored training on using the NHS Coronavirus Online Assessment Tool, which focused on a very specific set of symptoms.
- 4.1.31 CRS health advisors used the NHS Coronavirus Online Assessment Tool to walk patients/callers through the online assessment and followed national guidance prepared by PHE. The guidance was regularly updated in line with local and global developments with respect to the Covid-19 virus.
- 4.1.32 The CRS contract manager told the investigation that, as for the core NHS 111 health advisors, there were clear and robust CRS governance arrangements in place. CRS health advisors could escalate concerns to ‘clinical floor walkers’ – that is, clinical staff who could support non-clinical health advisors with medical queries arising from their calls. However, interviewees told the investigation that at some points the service was overwhelmed, with demand outstripping capacity, meaning that clinical support was not always available.
- 4.1.33 The CRS contract manager told the investigation that before the CCAS was implemented, health advisors were able to ‘warm transfer’ a caller to a trained 111 health advisor, who had access to a clinician if required. However, this was not always possible due to the demands on the service. After the CCAS was introduced, health advisors would triage a caller and then, if the caller reached a clinical assessment disposition, the health advisor would transfer them to a virtual queue and they would receive a clinical call back.
- 4.1.34 In February/March 2020, if a caller required further assessment beyond the scope of the early paper algorithms (used prior to introduction of the online assessment tool), they were directed to the core NHS 111 service for a more comprehensive triage.
- 4.1.35 The CRS contract manager told the investigation that more than 3,500 clinical staff were recruited to work in the CCAS. This included a range of clinicians, such as retired GPs returning to work, nurses, pharmacists, dentists, allied health professionals and shielding GPs. Interviewees recruited to CCAS told

the investigation that they were provided with IT training but received little in the way of clinical training. They established informal networks to try to share up to date information as knowledge of the virus improved.

- 4.1.36 Core NHS 111 policy is for all calls to be recorded for governance purposes. The CRS contract manager told the investigation that all calls to the CRS were required to be recorded, and only one provider was identified as not recording calls. This was rectified on 7 April 2020. The provider had not activated the recording functionality, as it had assumed the contract requirement was the same as for the NPFS. PHE told the investigation that contracts for the NPFS have an option to record calls, but this is set to 'not record calls' as default, with switching to 'record calls' attracting an additional cost.
- 4.1.37 The investigation was told on several occasions that calls had not been recorded or that the recording had been lost, or that the caller might have terminated the call before they were connected, despite families being adamant that calls took place.
- 4.1.38 The investigation was given various reasons for calls not being recorded, as outlined in **section 3.3.3**. The investigation recognises that the NHS 111 service had to expand, respond and adapt to the overwhelming number of calls during the early months of the pandemic. However, being able to review and learn from recorded calls to ensure the safety of patients and good practice of clinicians is considered to be a key part of governance.

The investigation notes the following safety actions

Safety action A/2022/055:

The UK Health Security Agency has taken steps to ensure governance arrangements are in place to assure themselves that contracted services are monitored and delivered as intended.

Safety action A/2022/057:

The UK Health Security Agency has taken steps to review contractual arrangements to ensure flexibility and the opportunity to implement the most appropriate contract for future public health issue.

Summary

- 4.1.39 The investigation acknowledges that the CRS was developed at pace and was based on a dormant influenza pandemic policy document. There was a clear understanding of how the service 'should' be delivered and work in practice.



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
<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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](https://www.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](https://www.nhs.uk) online or call us back. Further information about coronavirus (Covid-19) can be accessed at [nhs.uk](https://www.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.

4.2.8 The update also included the following:

- Pregnancy was built into the Covid-19 pathway, so that females aged between 11 and 55 years were asked: “Is there any chance the individual is pregnant?” and received appropriate care advice.
- A new vulnerability question was added to ensure those who had been identified as extremely vulnerable by the NHS reached an appropriate disposition of ‘Covid-19 risk clinical assessment service 2 hours.’ The question was: “Have you had a letter from the NHS advising isolation for 12 weeks?”
- A new question was added to establish if there is a continuous cough for those who are vulnerable to prevent them from reaching a self-care disposition. The question was: “Do you have a new continuous cough?”

4.2.9 If a self-care at home disposition was reached, the health advisors’ advice changed from “From what you have told me, the problem can be safely looked after at home” to “In the current situation, the NHS needs the problem to be managed at home.”

The supporting document clarifies this by stating: “This is due to more people needing to be directed to home care as the situation escalates.”

4.2.10 On 31 March 2020, NHS Pathways released a further update, highlighting a mistake in one of the algorithm pathways. In summary, the update stated:

- Those who are not breathless and identified as extremely vulnerable by the NHS will be triaged for persistent cough and fever.
- Those over 65 years of age will now receive a full breathlessness triage and will reach an appropriate disposition.

4.2.11 On 1 April 2020, NHS Pathways issued an update with new care advice regarding the risks associated with worsening (**see figure 8**). This new advice included specific ‘watch for’ symptoms for those who had been advised to self-care at home.

Figure 8 Care advice from the 1 April 2020 NHS Pathways release overview

- Coronavirus symptoms are often mild that sometimes may become more severe.

Watch for, and call us back straight away if:

- Any new or worsening shortness of breath or difficulty breathing.
- Feeling more breathless than usual when walking or talking.
- New confusion, or difficulty to wake.
- Further information about coronavirus (Covid-19) can be accessed at [nhs.uk](https://www.nhs.uk).
- If the conditions get worse or you have any other concerns, you must access [nhs.uk](https://www.nhs.uk) online or call us back.

4.2.12 From 22 May 2020, NHS Pathways had introduced a new 'loss of taste or smell' pathway after reviewing the emerging evidence and advice issued by the Chief Medical Officer in relation to loss of taste or smell as a symptom of Covid-19 infection. The new pathway enabled individuals reporting this symptom to be directed to online instructions and advice. Identifying these individuals was also thought to facilitate early testing and contact tracing.

The loss of taste and smell began to be reported in the media on 18 May 2020 however the update to NHS Pathways was not made until 22 May. NHS Digital told the investigation that this was because NHS Pathways was guided by PHE advice as to what the cardinal symptoms were, and PHE had not advised NHS Digital to amend NHS Pathways, plus some lead time was needed to make changes. This delay meant that patients who called with that symptom between 18 and 22 May would be told that it was not a symptom of Covid-19.

4.2.13 Providers told the investigation that updates would often arrive late in the day. On some occasions, they would hear an announcement from the Prime Minister about new information, and then have to build in work-arounds until they were provided with official updates to the algorithm. Staff at NHS Digital told the investigation that they were often alerted to changes in the public advice only an hour or so before the Prime Minister's announcements. The announcements usually resulted in a swell of calls to NHS 111 by the public, often before the algorithm had been updated.



- 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 an 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.



4.3.6 There may be risks associated with patients believing they have had a clinical assessment when they have in fact been guided through an algorithm by a non-clinical health advisor. Feeling reassured by their assessment may (and did, in the case of focus group attendees) delay their seeking medical assistance. This was also found to be the case in a 2021 study (Mansab, Bhatti, & Goyal, 2021):

“...while symptom checkers may be of use in the healthcare response to Covid-19 ... the ‘111 Covid-19 Symptom Checker’, if used as the sole point of initial healthcare contact, [is] likely to confer a tangible risk of delaying the presentation of time-critical acute illnesses.” (Mansab, Bhatti, & Goyal, 2021)

The CRS contract manager told the investigation that the 13 March 2020 update was not included in the online tool used by the CRS.

- 4.3.7 The investigation was told that safety-netting arrangements were in place. Safety netting is when information is given to a patient or their carer during a consultation about actions to take if their condition does not improve, or if they have further concerns about their health.
- 4.3.8 Family members in the reference events told the investigation that safety-netting advice was often unclear and, when they did call back, the Patients were again told to remain at home. They felt that insufficient action was taken, given the deterioration in the Patients’ condition alongside comorbidities.
- 4.3.9 In future events of novel viruses, where the messaging is for Patients to remain at home, safety netting or worsening advice would benefit from being clear, specific and readily available.
- 4.3.10 On 11 May 2020, the Covid-19 algorithm was integrated into the core NHS Pathways system. This meant that symptomatic callers to the core NHS 111 service (not the CRS) were triaged using standard triage principles and pathways, regardless of potential symptoms of Covid-19. Additional advice and changes to the questions asked were made to relevant symptom pathways, including the chest pain pathway. The following benefits of moving the assessment of probable Covid-19 symptoms into the standard triage process were highlighted.
- Patients with potential Covid-19 symptoms will receive a comprehensive triage, in a structure that is familiar to health advisors and that includes access to the full range of symptom pathways.
 - Where appropriate, dispositions specific to Covid-19 (for example, self-care at home) will still be reached.

Clinical call handling (core NHS 111 and CRS)

- 4.3.11 NHS Digital told the investigation that patients with underlying conditions (including diabetes) were put through to the CCAS for clinical assessment. However, because of the sheer volume of calls received, large queues formed for clinical call backs.
- 4.3.12 The investigation was informed that, in the early months, before the CCAS was put in place, health advisors could receive advice from clinical floor walkers (clinical staff who moved around the room, answering questions). However, the demand on the system meant that clinical advice was not always readily available.
- 4.3.13 In the reference events in the early part of the pandemic, patients with comorbidities were given stay at home instructions by the health advisor after following the algorithm without always receiving a clinical assessment. Whilst algorithm used by CRS did not allow for questions about comorbidities to be asked, callers who got through to core NHS 111 should have had their comorbidities considered.
- 4.3.14 The CRS contract manager told the investigation that while the CCAS and clinicians within the core 111 service could book face-to-face appointments for patients, this would depend on appointment availability. Clinicians working for both the CCAS and those within the core NHS 111 service could only book a patient into an available appointment slot, and not create appointments.

Summary

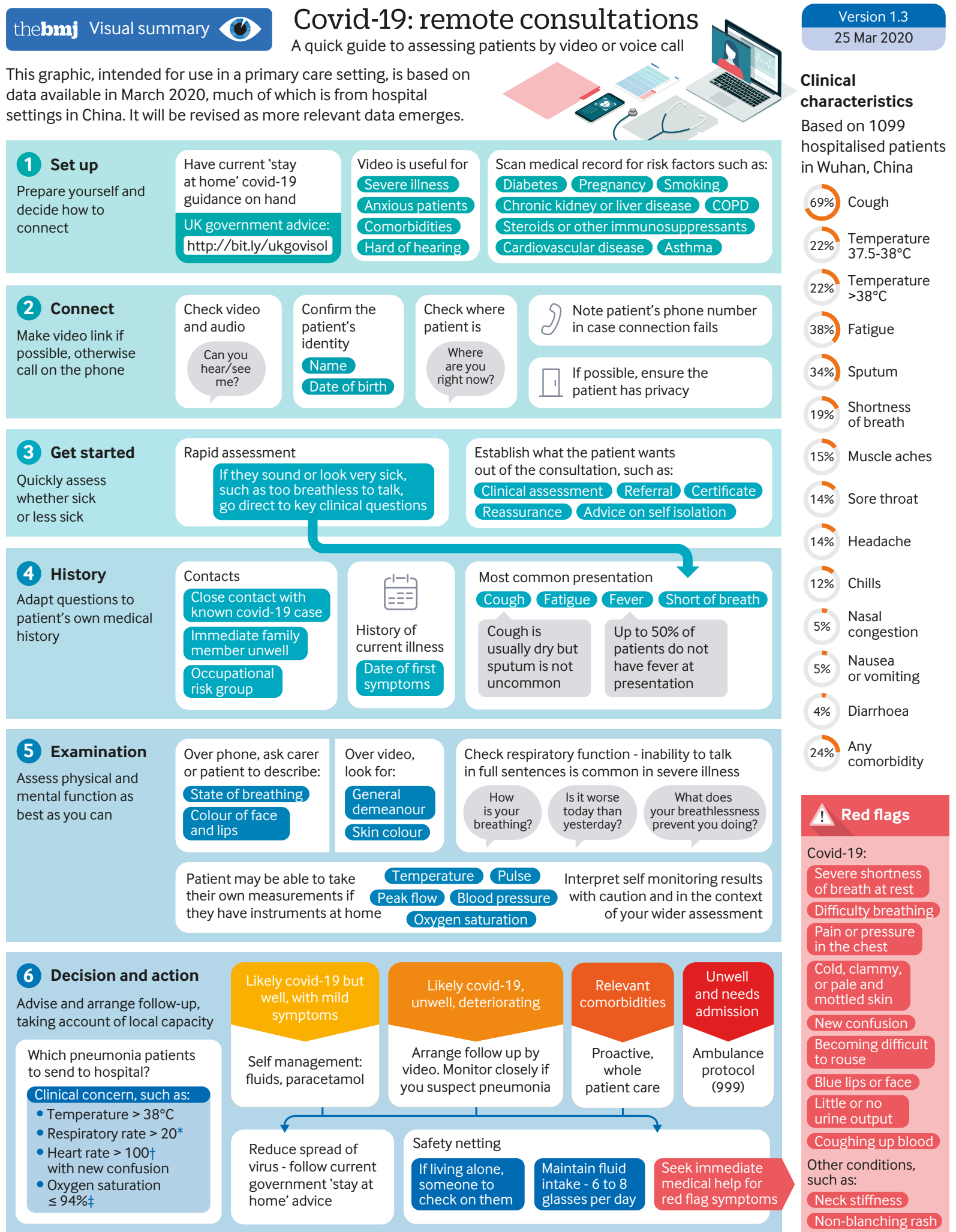
- 4.3.15 While evidence from the reference events suggests that some aspects of the NHS 111 CRS telephone triage service did not work as intended – in that patients who should have gone through to the CRS were instead routed to the core NHS 111 service – the investigation did not find evidence to suggest this influenced the advice given to the caller. The speed and scale of setting up the CRS meant that, in the early days of the pandemic (March and April 2020), demand for the service outstripped its capacity. There were no data with which the investigation could determine how routinely callers were routed through the core NHS 111 service rather than the CRS.
- 4.3.16 While there were safety-netting arrangements in place, some of the language in the health advisors' script had the potential to deter callers from calling back or seeking advice from other sources.

4.4 Remote assessments

- 4.4.1 In this section the investigation considers some of the literature regarding remote assessments. The aim is not only to learn lessons relevant to the current investigation but also for the future, given that many patients continue to be assessed and monitored virtually.
- 4.4.2 There were clear benefits to using remote assessments at the beginning of the pandemic, as NHS 111 was an established system that could be scaled-up at pace. Most of the public are familiar with the process of contacting NHS 111.
- 4.4.3 In addition, the use of remote assessments reduced the burden on other parts of the healthcare system (which were expected to be inundated) and decreased the risk of Covid-19 transmission by reducing face-to-face contact. Set within the context of an unknown novel virus, the need for remote assessments is understood.
- 4.4.4 Since March 2020, many healthcare assessments in both primary and secondary care settings have moved to a remote system. Now that the UK is following a model of learning to live with Covid-19, there is an opportunity to reflect on the use of remote assessment in its current form.
- 4.4.5 The Nuffield Trust has commented that:
- “It is essential that we understand – through robust evaluation and research – what the impact of the rapid shift towards digital technology [including NHS 111] has been on clinical practice, patients’ access to and quality of care, and the experiences of patients and staff. Studies in these areas remain limited, so more work is needed to learn from the experience and determine whether we need to revisit existing priorities.” (Nuffield Trust, 2022)
- 4.4.6 The investigation acknowledges the challenges faced by clinicians who remotely assessed callers with Covid-19-related symptoms. There was no standard for remote assessment, and no clinical framework to guide clinicians through calls with patients who had reached a clinical call back disposition. Given that many clinicians had returned to practice from retirement to support the service, it may have been beneficial to have more clinical support in place.
- 4.4.7 The investigation has reviewed documents that were produced at the end of March 2020 which provide helpful information for clinicians in managing Covid-19 and other suspected respiratory infectious diseases. Figure 9 was published on 25 March 2020 and provides information to clinicians carrying out remote assessments for callers with Covid-19 related symptoms.



Figure 9 provides information to clinicians carrying out remote assessments for callers with Covid-19 related symptoms



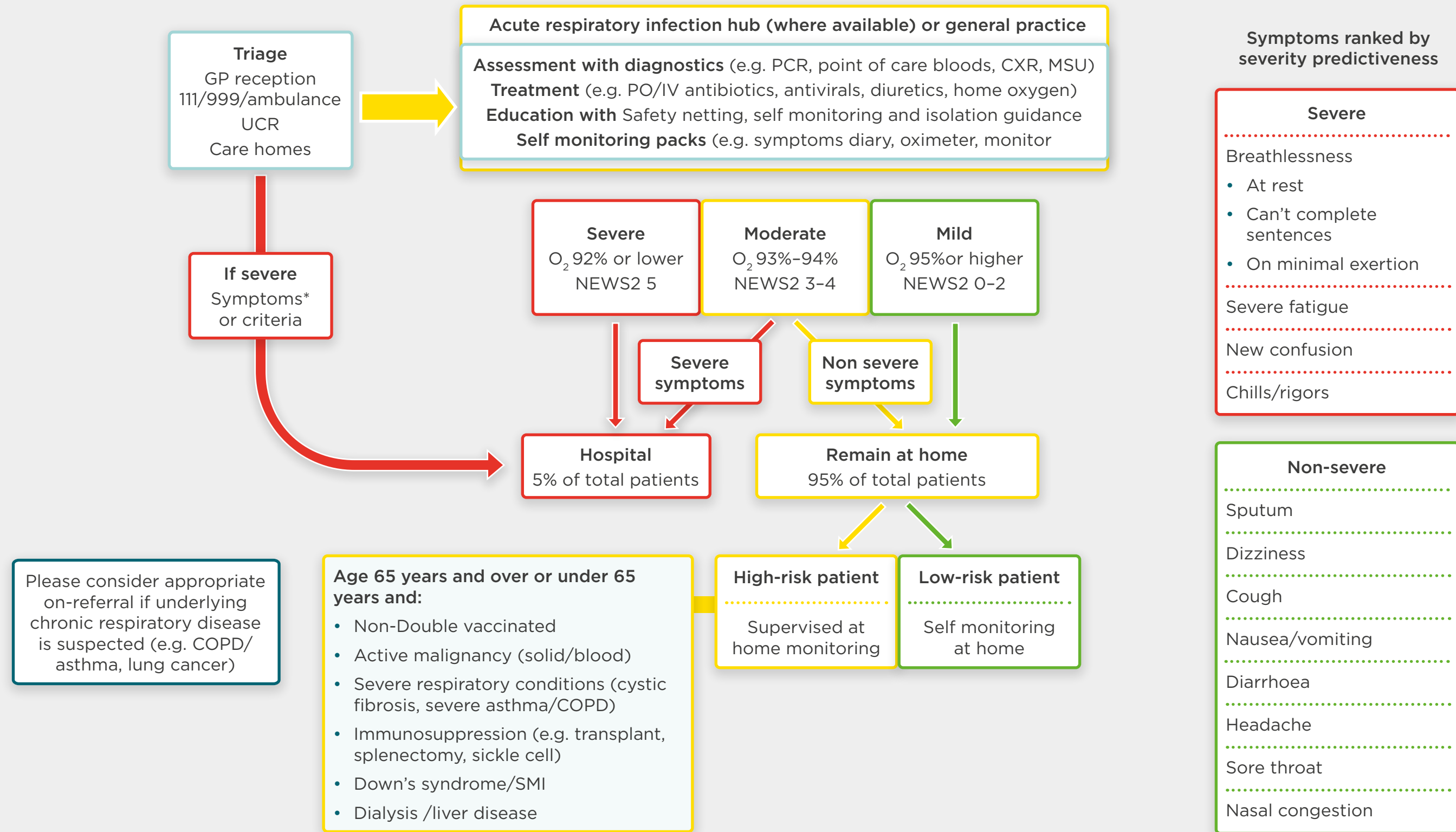
* Breaths per minute † Beats per minute ‡ If oximetry available for self monitoring

Image courtesy of the **BMJ Publishing Group Ltd.**

4.4.8 Figure 10 sets out a pathway for managing callers from a triage perspective – either face to face or remotely.

Figure 10 Acute suspected respiratory infectious disease community pathway

Acute suspected respiratory infectious disease community pathway draft 1.0



COPD, chronic obstructive pulmonary disease; CXR, chest X-ray; IV, intravenous; NEWS2, National Early Warning Score 2; PCR, polymerase chain reaction; MSU, mid-stream urine; PO, by mouth; SMI, severe mental illness; UCR, urgent care referral

4.4.9 Overall, the decision to encourage the public to call NHS 111 shifted the immediate burden of managing patients with Covid-19 from GPs and emergency departments. Although this may have been pragmatic during a time of crisis, there is a risk that it disrupted continuity of care. This is particularly relevant given the decision that primary care providers were not to be involved in triaging patients with Covid-19 related symptoms.

HSIB therefore makes the following safety recommendation and safety observation:

HSIB makes the following safety recommendation

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.

HSIB makes the following safety observation

Safety observation O/2022/191:

It may be beneficial, when dealing with a novel virus, for consideration to be given to the benefits of a face-to-face assessment for callers with comorbidities.

4.5 System improvement

- 4.5.1 NHS England and NHS Improvement told the investigation that it is now in a crucial phase of reflection and is asking itself what it would do in the case of another pandemic. It said that it would need to have a broader toolkit available, rather than relying on processes designed for an influenza pandemic.
- 4.5.2 There were many developments in care during the Covid-19 pandemic, with areas of the NHS showing huge flexibility and the ability to adapt. Interviewees told the investigation that the need to respond quickly meant that cumbersome arrangements that often delay changes in practice were suspended, and services were given more freedom to act innovatively and respond to changing requirements.
- 4.5.3 One example of this innovation is the introduction of the virtual ward round programme, which was developed after the first wave. This initiative used home pulse oximetry (measuring blood oxygen levels) for patients with Covid-19 and – successfully and safely – helped avoid unnecessary admissions to hospital, identified deteriorating patients early and supported the early discharge of patients from hospital. The importance of pulse oximetry was recognised when silent hypoxia (deteriorating oxygen

saturation levels without breathlessness) was seen in some patients with Covid-19 (NHS England, 2020). This development was relevant to the NHS 111 service, as it provided another opportunity for remote care.

4.5.4 A senior clinician shared with the investigation an initiative undertaken in his region whereby an assessment hub was created to assess and monitor patients in the community. The initiative resulted in a reduction in hospital stays, a decrease in patients needing to be admitted to the Intensive Care Unit and in mortality. Data is presented in Figure 11.

Figure 11 Results of a respiratory infections assessment hub initiative

Impact **North Hants Respiratory Infections Assessment Hub**
(10 PCNS joining forces to cover 250,000 population Nov-May 2021)

- Total seen at Hub- 4623 (873 Covid)
- RED admissions to hospital - 243
- AMBER assessments in hospital - 110
- GREEN - managed at home- 4270

	N-880 continuous COVID admissions	No home monitoring	Home self monitoring
Length of stay		13.2 days	6.9 days
Mortality rate (30 days)		20.5%	5.8%
ICU		38.8°C	5.8%
Readmissions (30 days)		104 beats per minute	0%

Covid-19 Oximetry @home: evaluation of patients outcomes

<https://bmjopen.gujualitybmj.com/content/bmmir/11/1/e001584.full.pdf>

Results Adjusted ORs for CO@h show an association with a reduction for several adverse patient outcome: 30-day hospital mortality (p<0.001, OR 0.21, 95% CI 0.08 to 0.47), hospital length of stay larger than 3 days (p<0.05, OR 0.62, 95% CI 0.39 to 1.00), 7 days (p<0.001, OR 0.35, 95% CI 0.22 to 0.54), 14 days (p<0.001, OR 0.22 95% CI, 0.11 to 0.41), and 28 days (p<0.05, OR 0.21, 95% CI 0.05 to 0.59). Within 30 days of hospital admission, there were no hospital readmissions for those on the CO@h service as opposed to 8.7% readmissions for those not on the service.

'Run' by 2ANPs,with supervising GPs with EMIS access at hubs to enable practice work.

- 4.5.5 The investigation understands that it is now common practice for patients with comorbidities who are infected with Covid-19 to have access to a pulse oximeter at home (purchased privately, provided by a community clinic/hospital or even prescribed). This gives the clinician performing a remote assessment objective data, and helps the assessment to be as thorough and safe as possible.
- 4.5.6 Subsequent research found that pulse oximeter measurements vary across ethnic groups (Crooks, et al., 2022). The researchers found that pulse oximeters overestimate oxygen saturation measurements – giving falsely high readings – in patients with hypoxaemia (low oxygen content in the blood), and that this error is larger in individuals from Black and Asian ethnic groups. This would need to be considered in the future response to any similar pandemic illness.
- 4.5.7 Figure 12, below, highlights some of the initiatives introduced to remotely assess and monitor COVID-19 positive patients in their own homes.

Figure 12 Co-created Covid-19 virtual care resources

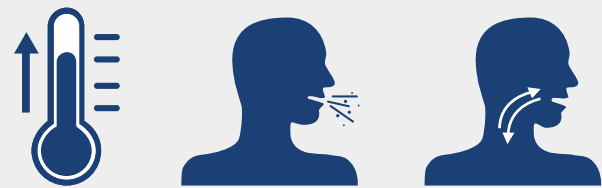
Inclusion criteria

1. Diagnosis of COVID-19: either clinically or positive test result **and**
2. Symptomatic **and** clinical concern **or**
3. Aged 65 years or older **or** under 65 years at high risk

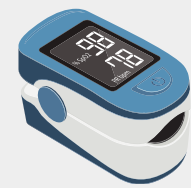
Flexible resource - sensitive models

- Self-monitoring (minimal clinical supervision)
- Diaries of symptoms and trend of O2 saturations
- Self escalate if worsening of symptoms/saturations

Symptoms



Oximeters



Diaries



Telephone check-ins



Apps/Dashboards



When and where to seek medical advice

Contact NHS 111
If you experience any of the following COVID-19 symptoms, you should contact 111 as soon as possible.

- Feeling breathless or difficulty breathing, especially when standing up or moving
- Severe muscle aches or tenderness
- Shakes or shivers
- If you use a pulse oximeter, your blood oxygen level is 94% or 93% or continues to be lower than your usual reading where your normal oxygen saturation is below 95% (do take a reading within an hour first)
- Sense that something is wrong (general weakness, severe tiredness, passing urine much less than normal, unable to care for yourself—simple tasks like washing and dressing or making food).

Attend your nearest A&E within an hour or call 999
A minority of people with COVID-19 will suffer more severe symptoms. You should attend A&E as quickly as possible or call 999 immediately if you experience the following:

- Your blood oxygen levels are 92% or less (retake your reading immediately first)
- You are unable to complete short sentences when at rest due to breathlessness
- Your breathing gets worse suddenly.

OR if you develop these more general signs of serious illness:

- Cough up blood
- Feel cold and sweaty with pale or blotchy skin
- Collapse or faint
- Develop a rash that doesn't fade when you roll a glass over it
- Become agitated, confused or very drowsy
- Stopped passing urine or are passing urine much less than usual.

You can access 111:

- Online at www.111.nhs.uk
- By phone 111
- Via your GP

You should tell the operator you may have coronavirus.

You should tell the operator you may have coronavirus and if you use a pulse oximeter give your oxygen saturation reading. These symptoms require urgent medical attention.

Remember - if you're pregnant, you should follow the guidance on pages 6 and 7.

Suspected coronavirus (COVID-19): Important information to keep you safe while at home

This leaflet is for adults with suspected or confirmed coronavirus who have not been admitted to hospital.

Version 8: April 2022.

The information in this leaflet is correct at time of publishing. Guidance is subject to change so please check web links for the most up-to-date information.

Self-monitoring COVID-19 diary

Name: _____

Please record these three times a day

Days since first symptoms	Date	Pulse	Oxygen level %	Temperature	Feeling (better/same/worse)	Breathing (better/same/worse)
Baseline reading						
Day	Time					

Normal blood oxygen level for most people - stay at home and continue to check your blood oxygen level regularly.

If you continue to record these blood oxygen levels contact NHS 111 or your GP as soon as possible.

If you continue to record blood oxygen levels of 92% or less attend your nearest A&E immediately or call 999.

Remember - if you're pregnant, you should follow the guidance on pages 6 and 7.

An ideal blood oxygen level is usually between 95% and 100%

How to use your pulse oximeter at home

Instructions on pulse oximetry & what to do with results

Animation

with thanks to simpleshop, Matt Hammetton & HEE

Recording and acting on the result

Keep the oximeter for at least 14 days, until you are symptom-free.

Please return the oximeter on any hospital admission.

Relaying your diary on NHS 111 helps your practice to learn.

Patient Covid monitoring diary and instructions

COVID Virtual Wards: First contact with a patient after discharge from hospital

Simulation e-learning

Caroline O'Keeffe
SMS to patient: AA florey accurx.com

Dear Mr Mickey, I'd like you to complete some questions about your symptoms via the link below. Please respond as soon as possible. The link will expire in 24 hours. Many thanks, Dr O'Keeffe

Please follow this link: <https://www.florey.accurx.com/27myafese>

You'll need internet on your phone (or you can open the link on a computer). If you cannot open it, please contact us. Camrose, Gillies & Hackwood Partnership

Delivered (11/6pm) 12:17

3. Can you complete a full sentence without having to take a breath?

Yes No

6. Please enter your oxygen saturation reading (SpO2%)

91

Back Continue

Your answers should be reviewed today (if you have responded within your practice's usual working hours). Please seek urgent medical attention if your symptoms worsen (e.g. call 111 if your practice is closed).

Please seek urgent medical attention if you develop any of the following:
• Difficulty breathing or breathlessness

When should you worry or not worry with Covid

4.6 Risk tolerance

4.6.1 Hollnagel (2015) set out four important capabilities that resilient systems must have in place to operate:

- The ability to respond appropriately to what is happening, through constantly adjusting to changing conditions and both expected and unexpected events, and addressing what is actually occurring.
- Having a clear understanding of what to monitor to enable timely updates needed to make required changes, by addressing the critical factors.
- Understanding the significance of what has happened, to enable learning from those experiences, by addressing the information presented.
- Anticipating and addressing possible and probable disruptive developments, threats and opportunities, by being aware of their potential.

4.6.2 The investigation did not find evidence of a proactive approach to planning to mitigate future risks to the healthcare system. While modelling related to influenza had been conducted, the investigation did not find evidence of modelling for a virus that could pose a different, more complex risk to the healthcare system. The UK Health Security Agency told the investigation: “No one thought it wouldn’t be flu.” Moving forward, it is important that learnings from Covid-19 influence planning for future potential pandemics.

4.6.3 With little initial understanding of the risks posed by Covid-19, there was no method to plan and prioritise an approach. Without a method, there was no way to understand what the risk tolerance was and what level of risk the system was prepared to hold. There appears to have been a normalisation of risk but without fully understanding the risk appetite. This is aligned with the findings of the National Audit Office (2021) and in keeping with an article from Goyal et al (2021), which states the following:

4.6.4 “During this pandemic, the clinical aspect of triaging has been substituted by a ubiquitous national strategy of using the NHS 111 online and non-clinical telephone triage service, replacing clinical judgement with predetermined thresholds for onward referral. Unless the thresholds for onward assessment are set low, many opportunities to prevent disease progression will be missed, and with it the opportunity to reduce mortality, prevent post-pneumonia complications, and prevent prolonged and protracted hospital admissions. In the UK, the thresholds for recommending any clinical contact are set high, and not just for the areas suffering a surge of infections, but for the entire nation – restricting access to care even where healthcare demands are relatively low.”



4.6.5 The report from the National Audit Office (2021) – entitled ‘The government’s preparedness for the Covid-19 pandemic: lessons for government on risk management report’ states that:

“Prior to the pandemic, the government did not explicitly agree what level of risk it was willing to accept for an event like Covid-19 ... The Cabinet Office told us that, as the pandemic started, the government lowered the threshold for the health and societal impacts of the pandemic that it deemed acceptable.”

4.6.6 The investigation did not find any written documentation suggesting an increased tolerance for risk for people who called NHS 111 with Covid-19-related symptoms. Clinicians across the healthcare system told the investigation that the bar for a face-to-face assessment or hospital admission was potentially raised because of the impact of Covid-19 on the NHS, but no single, specific instruction reflected this.

4.6.7 This also coincided with a lowering of the criteria for a remote clinical assessment. Clinicians conducting these assessments were predominantly retired GPs who had returned to practice during the pandemic (NHS Digital, 2021), and who could have been out of clinical practice for up to 3 years. Returning clinicians told the investigation they were concerned that advice and assessment techniques may have changed since they were last in a clinical role. This was combined with, globally, little national knowledge of the virus, its presentation and the implications of specific symptoms.

4.6.8 Clinicians remotely assessed multiple patients a day who presented with symptoms that, before the pandemic, would have resulted in a face-to-face assessment. However, at the peak of the pandemic, clinicians were aware that hospitals were incredibly busy and that the vast majority of patients would likely recover. This may have led to a situation where the abnormal circumstances of Covid-19 were normalised and impacted on perceptions of how sick patients were – indicated by comments in the reference events such as: “I’ve seen 13 far sicker patients today.”

HSIB notes the following safety action

Safety action A/2022/056:

The UK Health Security Agency has taken steps to assure itself of the safe and effective delivery of telephone triage for future healthcare emergencies. These have been tested through the delivery of services for Monkey Pox and Avian Flu.

HSIB makes the following safety observation

Safety observation O/2022/192:

It may be beneficial for strategic stakeholders in the healthcare system to understand and articulate adjustments in risk tolerance and thresholds in critical situations.



5 Summary of findings, safety recommendations, safety observations and safety actions

National investigation findings

- In March 2020, demand on the NHS 111 system greatly increased. This demand was not matched by system capacity, and only around half of calls were answered at that time.
- Evidence from families indicated that aspects of the NHS 111 Covid-19 Response Service (CRS) telephone triage, such as routing all Covid-19-related calls to the CRS, did not function as intended.
- There was strong national messaging advising patients to stay at home. This may have impacted on patients' willingness to seek medical advice from elsewhere (such as their GP), even if their condition deteriorated.
- The online algorithm used by CRS did not allow for an assessment of comorbidities. 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".
- According to processes laid out by the healthcare system, patients with underlying conditions (including diabetes) who spoke with a Core NHS 111 health advisor should have been escalated to a clinician for assessment. However, some patients with comorbidities did not receive a clinical assessment.
- The aim was for CRS to divert Covid-19-related calls away from the core NHS 111 service. However, many Covid-19-related calls continued to go through the core NHS 111 service. There was no way to route callers back to the CRS if they had unintentionally gone through to the core NHS 111 service.
- Calls that went to the core NHS 111 services should have been recorded under NHS 111 guidance. Calls to the CRS were also recorded, and all CRS providers (bar one) were initially set-up to record calls. However, when recordings of calls to the CRS were requested by the investigation, only one was made available.
- Health advisors do not have access to a patient's wider medical history. This increases the importance of appropriate safety netting – that is, telling a patient or their carer what to do if their condition does not improve or if they have further concerns about their health.

- Text messages informing patients of a positive Covid-19 test result included information about isolating and the legal requirements. However, there was no safety-netting advice on the 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 pandemic, there was limited understanding of the risks of a novel, non-influenza virus (such as Covid-19) to the healthcare system.
- The decision to tell the public to call NHS 111 rather than access healthcare advice in other ways (such as calling their GP) shifted the immediate burden of managing patients with Covid-19. This increased capacity within the healthcare system, but risked disrupting the continuity of care for patients with complex health needs.
- Learnings and developments throughout the pandemic have changed the ways in which callers are remotely assessed and managed. These include recognising the risk of silent hypoxia with Covid-19 and the importance of pulse oximetry.

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.



HSIB makes the following safety observations

Safety observation O/2022/190:

It may be beneficial to review triage software and safety-netting/worsening advice to ensure the language used by health advisors does not deter seriously unwell people from calling back or seeking medical advice if necessary.

Safety observation O/2022/191:

It may be beneficial, when dealing with a novel virus, for consideration to be given to the benefits of a face-to-face assessment for callers with comorbidities.

Safety observation O/2022/192:

It may be beneficial for strategic stakeholders in the healthcare system to understand and articulate adjustments in risk tolerance and thresholds in critical situations.

During the investigation, HSIB became aware of changes the UK Health Security Agency made to processes in a number of areas. These 'safety actions' are noted below.

HSIB notes the following safety actions

Safety action A/2022/055:

The UK Health Security Agency has taken steps to ensure governance arrangements are in place to assure themselves that contracted services are monitored and delivered as intended.

Safety action A/2022/056:

The UK Health Security Agency has taken steps to assure itself of the safe and effective delivery of telephone triage for future healthcare emergencies. These have been tested through the delivery of services for Monkey Pox and Avian Flu.

Safety action A/2022/057:

The UK Health Security Agency has taken steps to review contractual arrangements to ensure flexibility and the opportunity to implement the most appropriate contract for future public health issue.



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7 Appendix A: Full Covid-19 timeline

7.1 NHS 111 Covid-19 timeline

- 7.1.1 The NHS 111 Covid-19 response during the pandemic must be considered within a global context. A knowledge of the timeline for how the pandemic developed in England is critical to understanding the NHS 111 response.
- 7.1.2 In January 2020, the 4 nations public health high consequence infectious disease (HCID) group made an interim recommendation to classify Covid-19 a 'high-consequence infectious disease'. By 19 March 2020, Covid-19 was no longer considered to be a high-consequence infectious disease in the UK (UK Health Security Agency, 2020).
- 7.1.3 Throughout January, the World Health Organization continued to consider Covid-19 as a 'public health emergency of international concern'. Therefore, the need to have a national, coordinated response remained and this was met by the government's Covid-19 response (World Health Organization, 2020).
- 7.1.4 On 22 January 2020, the Department of Health and Social Care and Public Health England (2020) released a statement on Covid-19, which included the following comment:
- "The risk to the UK population has been assessed as low, based on the emerging evidence regarding case numbers, potential sources and human to human transmission. This has been raised from very low due to evidence on the likelihood of cases being imported into this country."
- This was reiterated by the Chief Medical Officer on 24 January 2020, who said:
- "We have tried and tested measures in place to respond. The UK is well prepared for these types of incidents, with excellent readiness against infectious diseases." (Department of Health and Social Care, 2020a)
- 7.1.5 In response to the national Covid-19 pandemic, NHS Pathways initially supported NHS 111 and ambulance services that were using its algorithms by issuing workaround guidance documents.
- 7.1.6 These were manual processes that health advisors and clinicians would follow when managing calls regarding Covid-19. The first of these documents was issued on 23 January 2020. Between 23 January and 16 March 2020, NHS Pathways issued 19 guidance documents (NHS Digital, 2020).

- 7.1.7 On 30 January 2020, a statement from the four UK Chief Medical Officers on Covid-19 stated (Department of Health and Social Care, 2020):
- “... we are advising an increase of the UK risk level from low to moderate. This does not mean we think the risk to individuals in the UK has changed at this stage, but that government should plan for all eventualities.”
- 7.1.8 At the end of January 2020, NHS Digital was alerted to the need to support the NHS in responding to calls about potential Covid-19 related symptoms.
- 7.1.9 In the early days of the pandemic, public announcements drove the demand for NHS 111 services.
- 7.1.10 On 10 February 2020, in accordance with Regulation 3 of the Health Protection (Coronavirus) Regulations 2020, the Secretary of State declared that the incidence or transmission of Covid-19 constituted a serious and imminent threat to public health (The Gazette Official Public Record, 2020).
- 7.1.11 Throughout February 2020, all Covid-19-related calls to NHS 111 were managed through the core NHS 111 service. On 18 February 2020, the NHS took action to protect both GP practices and hospital emergency departments from Covid-19 by advising those with a relevant travel history and suspected symptoms to call NHS 111, and not to go to their GP practice, pharmacy or hospital (NHS England and NHS Improvement, 2020).
- 7.1.12 Towards the end of February 2020, primary care was overwhelmed (NHS England and NHS Improvement, 2020) and extra health advisors were recruited to support the opening of the NHS 111 Covid-19 Response Service (CRS) via the government’s standing contract for an influenza pandemic.
- 7.1.13 On 5 March 2020, NHS England advised GP practices to stop online bookings for face-to-face appointments (to avoid infected patients visiting surgeries) and switch to a telephone-only triage system. On the same day, the CRS system was activated with a view to managing all Covid-19-related calls, with all non-Covid-19 calls going through the core NHS 111 service.
- 7.1.14 On 8 March 2020, the Health Secretary said that calls to NHS 111 had increased by more than a third. Five hundred extra staff had already been put in place to help with this increase.
- 7.1.15 On 12 March 2020, the Prime Minister said (GOV.UK, 2020):
- “I urge people, who think in view of what we’re saying about their potential symptoms that they should stay at home, not to call 111 but to use the internet for information if they can.”

- 7.1.16 Also on that date, a government statement (Department of Health and Social Care, 2020) announced moving out of the contain phase and into delay, in response to the ongoing Covid-19 outbreak. The statement said:
- “You do not need to call NHS 111 to go into self-isolation. If your symptoms worsen during home isolation or are no better after 7 days contact NHS 111 online at 111.nhs.uk. If you have no internet access, you should call NHS 111. For a medical emergency dial 999.” (Department of Health and Social Care, 2020b)
- 7.1.17 On 16 March 2020, the Prime Minister said during a televised broadcast (GOV.UK, 2020):
- “... now is the time for everyone to stop non-essential contact with others and to stop all unnecessary travel ... It goes without saying, we should all only use the NHS when we really need to. And please go online rather than ringing NHS 111.”
- 7.1.18 On 16 March 2020, NHS Pathways issued another update to its algorithm (release 19.3.3) (NHS Digital, 2020). This update delivered a new pathway to be used by all core NHS 111 providers in England and the 999 ambulance services using the same system. This new pathway assessed those calling with a concern about Covid-19 and provided assistance for those looking for health advice, with or without Covid-19 related symptoms. The release also contained a symptomatic assessment for those who said they were unable to manage their symptoms at home.
- 7.1.19 On 19 March 2020, NHS England published further guidance that included moving all primary care to a total triage system (that is, speaking to all patients before making an appointment) and identified a small number of practices locally for face-to-face appointments. Practices for people with suspected Covid-19 were often known as ‘hot hubs’.
- 7.1.20 On 22 March 2020, up to 1.5 million people in England had been identified by the NHS as being at higher risk of severe illness if they contracted Covid-19 and were urged to stay at home to protect themselves (Department of Health and Social Care, 2020).
- 7.1.21 On 23 March 2020, the Prime Minister announced a national lockdown (GOV.UK, 2020): “Please stay at home, protect the NHS and save lives”.



7.1.22 On 8 June 2020, the telephone triage aspect of the CRS was stood down due to reduced need, with the aim that it could be quickly recommissioned as required in the event of new waves of infections. 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). The telephone triage aspect of the CRS was stood-up again on two further occasions:

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



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