

## COVID-19 community pathway: How right did we get it?

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### Abstract

**Background:** We report on the outcomes from a COVID community pathway established in Response to the first wave of the COVID-19 pandemic.

**Aim:** A pathway was established to triage patients presenting with symptoms compatible with COVID-19, to identify those who would benefit from hospital-based assessment and those who could be safely discharged with safety-netting and self-care advice.

**Design and Setting:** Patients presenting with symptoms compatible with COVID-19 were advised to contact NHS 24, and were referred to a COVID community pathway for further clinical assessment if necessary.

**Method:** Outcomes for patients seen in this pathway between 1 and 30 April 2020 are presented.

**Results:** 4,333 patients were referred to the COVID community pathway. 4.8% were directed to hospital Emergency Departments after initial telephone triage. 74% were discharged with safety-netting advice without a face to face assessment. Of these patients, 8 patients (0.25%) were subsequently admitted and died in hospital from COVID-19. 21% were referred to a COVID Assessment center. Of those seen face to face, 85% were discharged with safety netting advice, and 15% were referred to secondary care. Of those discharged, 0.5% subsequently died of COVID-19. Of those referred to secondary care, 40% were not admitted or discharged within 24 hours and 60% were admitted for 24 hours or more.

**Conclusion:** Clinicians working within the COVID community pathway were able to appropriately triage patients using telephone assessment, and where necessary, face to face assessment to identify those who were most likely to benefit from hospital based assessment.

**Clinical Relevance and Contribution to Literature:** Many primary care clinicians are experienced at community-based triage of patients presenting with a broad range of illness and injury. COVID-19 illness encompasses a range of presentations from mildly symptomatic through to severe pulmonary inflammation, and a subset of patients may deteriorate and require hospital admission. There are currently no validated prognostic models for patients, assessed in the community, to safely identify those patients who are at risk of deterioration. Primary care clinicians work in a COVID community pathway demonstrated safe and effective triage using telephone consultation, and where required, face to face clinical assessment focusing on a key clinical parameters: oxygen saturation, temperature, general appearance and respiratory rate.

**Keywords:** COVID-19, Triage, Primary health care.

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### Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV 2) is a strain of coronavirus responsible for causing the disease COVID-19 and was first identified in Wuhan, China around December 2019 [1]. The Wuhan outbreak was declared a public health emergency of international concern by the World Health Organization (WHO) on the 30 Jan 20. The first case of COVID-19 in NHS Lothian is thought to have occurred around the 26 Feb 20, though the first confirmed case in NHS Scotland was 01 Mar 20. On 12 Mar 20, the WHO described the COVID-19 outbreak as a global pandemic and a day later, Scotland's first death from COVID-19 occurred in Lothian.

In response to the pandemic, the Scottish Government mandated all NHS Scotland health boards to set up Community COVID pathways by 23 March 20. The stated objective was to triage patients presenting with suspected COVID-19 to ensure that the best possible location of care was identified [2]. There were reported incidents from around the world of hospitals and Intensive Care Units being overwhelmed with patients, and so it was deemed essential that disease severity was assessed in a consistent way to ensure that patients who would benefit from hospital admission were admitted. The aim therefore was to create telephone triage hubs with community assessment centers to assess patients in a safe and consistent manner.

Public facing messaging in March/April advised people with symptoms of fever or a new, continuous cough to call NHS24 on 111. Patients were then triaged by NHS24 predominantly using computer-based algorithms with discretionary clinical input.

This triage of patients with symptoms of possible COVID-19 infection resulted in the following outcomes: either immediate admission to hospital via emergency services, transfer of care to a COVID hub for further triage or advice for self-care.

Those patients directed to the COVID hub underwent in-depth clinical triage. This was in the form of a traditional telephone assessment of the patient carried out by a trained clinician. This was a clinical assessment, taking into account demographic and comorbidity information, as well as assessment of how unwell the patient sounded on the phone. The outcomes of this telephone assessment were: discharge with self-care advice and safety-netting; direct admission to hospital via Emergency Department; advice to attend a COVID assessment center for further clinical evaluation; or a GP home visit for house-bound patients. Under-16s were sent to the local children’s Emergency Dept if further clinical assessment was required. A qualitative assessment of the outcomes for this group has not been included in this paper. Patients could be referred to a COVID assessment center by their own GP.

In the Face to Face assessment centers, clinicians physically assessed patients using an acronym for clinical triage (STAR) taking into account oxygen Saturation, Temperature, general Appearance and Respiratory rate for the assessment of presenting adults. It was not a scoring system, but a tool devised to help clinicians recognize illness severity and therefore a potential need for admission (Table 1).

Clinicians were advised to admit patients based on assessment of their current clinical status, but accept the potential for future deterioration, so were expected to clearly ‘safety-net’ patients who did not require contemporaneous admission. Consequently, the expectation was that, for patients who did deteriorate as a result of COVID-19 symptoms at a future point, they would require to re-access the pathway via NHS 24. The outcomes from the COVID assessment centers were discharge to self-care with safety-netting or onward referral to secondary care for further assessment.

The peak of the first wave of the pandemic in Lothian occurred in early April. During this phase of sustained community

transmission, there was a COVID hub and up to five assessment centers, open 24 hours a day, 7 days a week. These were staffed by a mix of general practitioners, and nurses / nurse practitioners, paramedics, physios and hospital doctors (Consultants and training grades).

## Methods

Patients were either triaged by NHS24 or referred by their own GP for an advice call from the COVID hub. All advice calls were recorded on Adastra (electronic patient record system in out-of-hours primary care) with outcomes: discharge with advice/safety netting; emergency admission; referral for Face to Face assessment at COVID assessment centers; or if required, a home visit. Patient demographics were collected, but not comorbidities, for the purpose of the study

Additional data regarding patient attendances, and outcomes from the COVID hub was sourced from NHS Lothian tableau dashboards, or TRAK (secondary care patient electronic record).

Outcomes of assessments were collected between the 1st and 30<sup>th</sup> of April which corresponded with the peak of the first wave of the pandemic for the purpose of this study.

## Results

Between 1st April and 3rd August 2020, 11,346 patient contacts with the COVID hub were made; 87% of patients (8310) contacted the service once. 12.8% (1222) contacted the service between two and five times. 0.2% 19 patients were referred to the COVID hub more than five times.

Between 1st and 30<sup>th</sup> April 2020 4333 patient contacts were referred to the COVID hub by NHS24. 4.8% (207 patient contacts) were directed after COVID hub telephone assessment to the Emergency Dept.

Some patients were referred to other primary care services by the COVID hub, either because it was felt that their primary presenting problem was unlikely to be COVID- 19, or the patient required a home visit for further clinical assessment of disease severity.

914 patient contacts (21.1% of patient contacts, 863 patients) were referred for further face to face clinical evaluation at a COVID Assessment centre, but 5 did not attend (Table 2). After that clinical assessment, 777 patient contacts were discharged with self-care/safety-netting advice.

**Table 1:** The STAR assessment.

<b>S</b>	Oxygen saturation (room air)	≤92% (if COPD, then either ≥4% below baseline or ≤88%)
<b>T</b>	Temperature	≥38.5° C
<b>A</b>	General appearance	well or unwell
<b>R</b>	Respiratory Rate	≥24 per minute

**Table 2:** Demographics for 859 individual patients, who made 914 patient contacts for face to face clinical assessments. Data for 4 patients is missing.

Demographics of patients attending face to face clinical assessment			
Age Group	Number (%)	Male	Female
0-20	24 (2.8)	11	13
21-40	270 (31.4)	81	189
41-60	398 (46.3)	146	252
61-80	148 (17.2)	69	79
81+	19 (2.2)	7	12

137 patients were referred by a COVID Assessment Centre to secondary care, but one patient did not travel; after secondary care assessment 55 of these were either not admitted or discharged the same day and 81 were admitted. Of these 81 admitted patients, 80 underwent viral NTS for SARS CoV-2, 36 (45%) had a positive swab result, 44 had one or more negative swabs. Six patients ultimately required critical care. Six patients from this admitted cohort died, and 75 were ultimately discharged.

Between 1-30 April 2020, 3212 patient contacts were discharged with safety-netting advice after a COVID hub telephone assessment, and were not seen face to face in the COVID Assessment Centre. Of these patient contacts, 8 (0.25%) were subsequently admitted within 3 days (mean 1.5 days, range 0-3) of their contact with the COVID hub, with confirmed COVID-19 and died. There were 5 males and 3 females, age range

58-99. Death occurred after a median of 6.5 days (mean 8.12 and range 1-19 days) after admission.

During the same 30-day period, of those patients who had been seen in a COVID assessment centre, and were discharged with self-care advice, 4 (0.5%) subsequently died in the community.

Of patients seen in a COVID assessment centre in NHS Lothian (n=1080) between 30 March and 3 May, 292 (27%) underwent viral NTS, with 110 of them (37%) having a positive result.

## **Discussion**

The onset of the COVID-19 pandemic led to real concerns that hospitals would become overwhelmed, and therefore a triage pathway was rapidly introduced to manage patients in the community with suspected COVID-19. The aim was to avoid admitting patients who might not benefit from hospital care at that time, and ensure that there was a safety-net in place for patients who had suspected COVID-19 and who were remaining in the community in case of deterioration. At the outset of the pandemic and at the time of this audit, there were no evidence-based anti-viral or other specific treatments available. The priority was to identify patients who were in immediate need of, or at increased risk of needing supportive care (supplemental oxygen, intravenous fluids, non-invasive or invasive ventilation and other critical care support) or specific intervention (antibiotics for super-added bacterial infection, anti-coagulation for thrombotic events). Patients who were well enough to stay at home were encouraged to self-care along with necessary self-isolation.

During a relatively early phase of the pandemic, at a period of relatively high community prevalence with sustained transmission, a COVID assessment pathway was rapidly established comprising NHS 24, COVID hub and COVID face to face assessment centers. This primary care pathway achieved relatively safe and effective triage, referring less than 5% of patients into secondary care services. Of 81 patients who were referred to secondary care from the pathway, six patients ultimately died. For those 3212 patients who were discharged after telephone assessment with safety netting advice, 8 patients subsequently died of COVID-19, all needing admission within 3 days of their telephone contact. It is not clear whether earlier referral in this patient group would have altered their outcome.

Of 777 patients who were discharged with safety-netting advice after face to face assessment at a COVID assessment center, four patients subsequently died in the community.

## **Strengths and limitations**

This study has not been able to track the outcome of all patients assessed by the pathway. We have not been able to show how many patients subsequently required admission for any reason after COVID hub telephone assessment, but we have identified those patients who were admitted and subsequently died from COVID-19, with in-patient stays of median 6.5 days (range 1-19 days). We have not been able to identify whether any patients died in the community after telephone assessment from COVID-19. It might also be expected that some patients with significant COVID-19 illness in the community were not admitted as a result of an agreed anticipatory care plan.

Not all patients being seen in this pathway had a test to confirm or exclude SARS CoV2 infection. The restrictive testing strategy operating at that time, meant that only those patients admitted required viral combined nose throat swabs (NTS) for SARS CoV2 PCR testing. It is therefore expected, of those patients not admitted, that an unknown proportion would have had COVID-19. A sample of patients attending daily (27%) did undergo testing, during this period, for the purpose of helping ascertain nationwide community prevalence, and of this group 37% had a positive swab result. Of those patients who were seen by the pathway and ultimately admitted, 45% had a positive swab. Furthermore, the sensitivity of viral NTS in symptomatic patients will vary depending on the phase of the illness, but may at best be around 80% [3] and therefore a proportion of 'negative' patients may indeed have had COVID-19.

It was evident that the relatively broad case definition (subjective or objective fever, and/or new persistent cough; alterations to sense of smell and taste came later) resulted in a large number of patients being referred to the triage hub as possible COVID-19 and then for face to face assessment if required. The purpose of the COVID triage pathway was to answer a simple question – if this patient has COVID-19, would the balance of benefit favor that patient being admitted? The pathway was not designed to manage other clinical presentations and therefore the experience for patients with 'non-COVID' causes of their presenting symptoms may have been relatively poor.

Such patients required further re-direction to their GP, to out of hours GP services or other specialty input for definitive management. During April, these 'non-COVID' patients were proportionately fewer, but this undoubtedly became a more significant problem when the prevalence of COVID-19 subsequently fell in this community.

## **Comparison with existing literature**

As the pandemic has progressed, some authors have suggested that earlier admission of patients or community monitoring of oxygen saturation might reduce mortality by earlier identification of deteriorating patients [4,5]. However, there are no randomized trials to confirm this. Community monitoring of oxygen saturation was not established in our region at the time of this study. Currently there are no validated prognostic tools to identify which patients, with COVID-19, in the community

are at increased risk of deterioration [6]. With developing evidence for some treatment strategies, there will be a need to identify which patients groups will benefit, and at what stage of their illness, and this may change the balance towards earlier admission for intervention.

### **Implications for research and/or practice**

There may be value from properly conducted studies designed to assess if earlier admission for monitoring and supportive care, or community based monitoring might reduce mortality or significant morbidity. We need to identify which risk factors and clinical indices [7] which can be ascertained by clinical assessment in the community might help identify those patients who are more likely to benefit from early admission or community-based monitoring.

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