An Evaluation of Scotland's COVID-19 Self-management Pathway Roll-out

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CONTENTS

1.1 BACKGROUND

The evaluation of Scotland's clinically managed COVID-19 remote health pathway[1] showed that it increased access to services for those who needed them most, people remotely monitoring their COVID-19 symptoms had positive experiences of it, and staff using the pathway felt engaged and supported. There was also some evidence at a small scale of increased self-management, resources being used effectively and efficiently, and reduced health inequalities.

In late December 2021, as the number of Omicron variant cases continued to rise, the Scottish Government recognised that the COVID-19 Connect Me pathway's ability to identify deterioration at an early stage[2] could help reduce the predicted demand for clinical services. Recent evidence on the use of remote COVID-19 monitoring is summarised in Appendix 1. The Technology Enabled Care (TEC) programme's strong working relationships were key to supporting this response to the latest pandemic wave, building on the implementation of the COVID remote monitoring pathway of 2020/21. Two major changes were agreed for the pathway, although it retained the same symptom questions; it would be used only for self-management to avoid burdening clinicians, and a single patient contact point for on-boarding would be established via the National Contact Centre (NCC).

The Inhealthcare system had been procured as the national remote monitoring platform, so the supplier was able to make the necessary adjustments before roll-out. It was recognised that people using the pathway might also need written information on how to monitor, what the different trigger levels were, and who to contact for advice. It was agreed that information for patients would be included, along with a pulse oximeter, in packs made up by NHS National Services Scotland. They were distributed to healthcare professionals in line with advice obtained from each NHS Board who agreed to use the roll-out pathway. The COVID-19 Bronze Group was reconvened to oversee progress. This reported to the Virtual Wards/Hospital at Home group chaired by the Deputy Chief Medical Officer.

1.2 BRIEF SUMMARY OF THE PATHWAY

This pathway enabled people who had COVID-19 symptoms below the threshold for hospital admission to self-monitor their condition. Instructions for how to register with the National Contact Centre and for any assistance required were provided in the information leaflet, along with how to use a pulse oximeter to measure their oxygen saturation level. They could then remotely respond to questions from the system about their symptoms via SMS text messages or automated telephone calls. Questions were sent twice a day for 14 days, and what was asked varied according to what they submitted.

1.3 OUTCOMES TO BE ACHIEVED

The COVID-19 Bronze Group discussed how best to evaluate the roll-out pathway and agreed that a mixture of process and outcome measures should be included, along with surfacing the lessons that should be learned. Due to small numbers using the pathway, some planned data sources were not accessed e.g. it was agreed we should not apply to the Public Benefit and Privacy Panel for health system information. The processes and outcomes[3] included were:

PROCESSES	No. people referred for self-monitoring	No. packs distributed to services	No. people on-boarded
	No. people using the different channels	No. people submitting readings	
OUTCOMES	People have positive experiences of services	Staff feel engaged and supported	Reduced health inequalities

2. METHODS OVERVIEW

Various data sources were accessed for both process reporting and the Contribution Analysis[4] employed to assemble evidence of outcome achievement. A limitation for this evaluation is the small numbers involved, both using the pathway and responding to surveys, raising questions about representativeness.

- National Contact Centre reports about on-boarding people to the system
- Connect Me team data on distribution of COVID-19 self-management packs by NHS National Services Scotland (NSS)
- System supplier (Inhealthcare) data on the numbers registered from each NHS Board (to 6th June 2022). Patient level data from the supplier on those who used the pathway combined for a three-month period (18th March to 12th June, 2022), comprising COVID-19 symptom responses (breathlessness, cough, weakness/tiredness, oxygen saturation) by monitoring date. The channels used and any alerts the system sent were also recorded. Separate reports contained the standard patient feedback survey results, along with some postcode details
- An online survey for people receiving COVID-19 self-management packs to provide feedback
- Three online surveys for clinicians, exploring views on the system and feedback from those receiving COVID-19 self-management packs/oximeters
- Interviews were conducted with key national and NHS Board stakeholders involved with the pathway, at both strategic and operational levels

3. RESULTS

3.1 NATIONAL CONTACT CENTRE (NCC) ON-BOARDING TO THE SYSTEM

A central point for on-boarding people avoided the need for busy clinical staff having to undertake this administrative task, but also allowed those in need of assistance to ask any questions and be helped through the process. The NCC registration service was set up quickly, and staff were identified and trained in various aspects of the work. However, a work-around was required to look up the callers CHI number and to only use staff members who had access to the NHS networks while a full solution was developed. This meant that NCC staff manually completed a survey on the required data after each call. Understandably, there were times when this did not happen, resulting in an incomplete dataset. Details were captured on a sample of the calls, quality checks that the team undertook, and call waiting and handling times.

Between February and June 2022 the themes NCC staff received calls to the dedicated phone number about were:

Remote monitoring pack registration n=91	***General remote monitoring enquiry n=8***	***Issue with remote monitoring pack n=2***	***Incorrect number n=41***	***Other n=10***

From these calls, NCC staff were able to register 82 people but could not do so for another 10 (six had IT issues and were called straight back, while the other four had not received their pulse oximeter). Notably, 65 people (60%) knew their CHI number for registration, while 44 (40%) did not. The referral source was captured for 89 people:

GP n=43	***Hospital n=24***	***Midwife n=13***	***NHS24 n=7***	***Scottish Ambulance Service n=2***

Members of the NCC team captured data on the quality checks for 44 calls between March and May 2022, rating the call-handlers between 1 (no rapport) and 5 (excellent or outstanding). This showed that 43 calls were scored 3 (n=3), 4 (n=31) or 5 (n=9) out of five, and the one rated 1 out of 5 was due to the poor line and was not about registration. It was deemed that 40 callers had had their needs met and the four who had not were due to poor line quality (n=1) or a problem with the work-around to access the Inhealthcare system (n-3, all were called back). Three of these callers had low oxygen saturation (SpO_2) levels and were signposted to seek medical help.

Average call handling times were good between 1st March and 6th June, 2022, with an average 32 second wait and an average of 21 minutes spent handling the calls. It had been hoped that NCC staff would be able to obtain verbal consent from people phoning them for a follow-up interview about using the self-management pathway, but this was not to possible.

3.2 HOW MANY COVID-19 SELF-MANAGEMENT PACKS WERE DISTRIBUTED?

The Technology Enabled Care team worked collaboratively with NSS to ensure COVID-19 self-management packs were available to healthcare professionals as they were needed. Meetings were held with each NHS Board to discuss how the pathway would work and agree the mode of distribution. Eight of the 14 boards had packs offered/sent directly to GPs (seven to Out of Hours as well), three agreed their own local arrangements, and three Medical Directors declined the offer of packs for their Boards (individual GPs or other services have since been offered packs by request). Packs were prepared by NSS staff and **by 30th June, 2022 a total of 11,846 had been ordered**.

3.3 HOW MANY PEOPLE REGISTERED TO USE THEIR COVID-19 SELF-MANAGEMENT PACK?

People registered either for the COVID-19 self-management pathway, or a version for maternity patients (Table 1).

***Table 1** – No. registrations by 25.7.22*	**Maternity pathway**	**Self-management pathway**	**Total**
NHS Lanarkshire	5	49	**54**
NHS Grampian	2	26	**28**
NHS Highland	12	14	**26**
NHS Tayside	2	19	**21**
NHS Greater Glasgow & Clyde	-	7	**7**
NHS Orkney	-	4	**4**
NHS Western Isles	-	3	**3**
NHS Fife	-	2	**2**
NHS Ayrshire & Arran	-	1	**1**
NHS Dumfries & Galloway	-	1	**1**
NHS Forth Valley	-	1	**1**
Not Known (care facility unassigned)	-	4	**4**

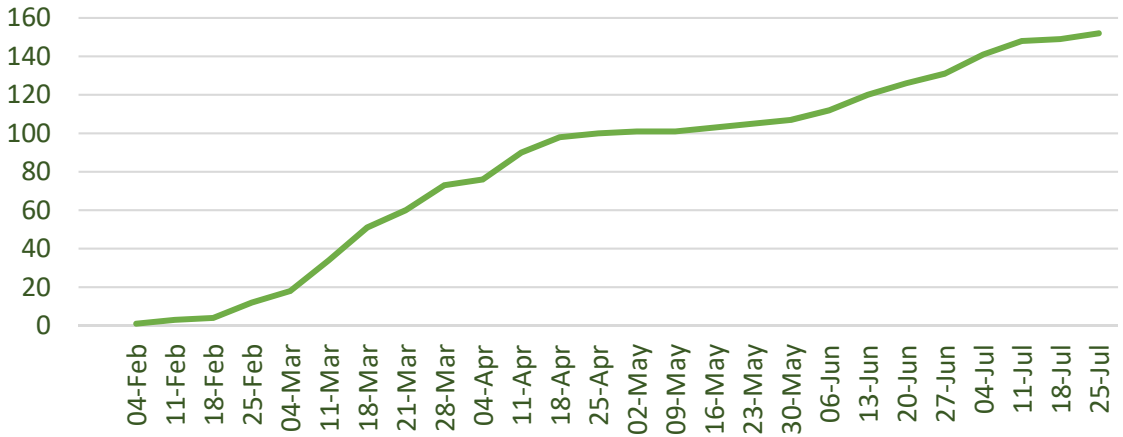
152 people had registered to remotely monitor their COVID-19 symptoms using the system by 25th July 2022

131 had used the self-management pathway and 21 the maternity one

Figure 1 shows that after the pathway went live in early February 2022, the cumulative number of registrations increased more steeply during March and early April compared to mid-April onwards. The reduction in rate of registrations coincided with the number of Omicron cases decreasing nationally (Public Health Scotland COVID-19 Daily Dashboard) and testing kits ceasing to be widely available to the public.

In terms of the number of people who used the pathway, the 152 recorded in just under five months is comparable to the number of people who used the clinically managed COVID-19 pathway in 2021, which totalled 149 in around seven months.

***Figure 1** - Cumulative number of people registered for the COVID-19 self-management pathway, over time by week in 2022*



3.4 WHAT WE KNOW ABOUT THOSE WHO USED THE COVID-19 SELF-MANAGEMENT PATHWAY

The reports received from the supplier are anonymised so NHS Board of residence, age and gender are the only demographics included, along with the communication channel used (Tables 2 & 3). By 1st July 2022 this data had been captured for 129 of the 152 people in Table 1.

***Table 2** – Channel used by gender (n=85 women, 44 men)*

	SMS	Phone	TOTAL
Female *	82	5	87
Male *	39	7	46
TOTAL	**121**	**12**	**133**

** 2 women and 2 men used both channels*

***Table 3** – Channel used by age (n=129, oldest = 89)*

	SMS	Phone	TOTAL
Under 30	22	2	24
30 to 39	17	0	17
40 to 49	20	2	22
50 to 59	22	2	24
60 to 69	20	1	21
70 to 79	16	4	20
80+	4	1	5
TOTAL	**121**	**12**	**133**

** 4 people aged 25, 27, 44, 72 used both channels, all SMS only once*

Tables 2 & 3 show that **more women than men** used the self-management pathway, but there was a fairly even **spread of ages from under 30 to 89 years old**. **Ten times as many used SMS texts as the telephone**, although four used both channels (each only using SMS once).

Table 4 *– Board of residence by pathway and channel (n=129)*

	No. used SMS for self-management	No. used phone for self-management	Total no. used self-management	No. used SMS for maternity	No. used phone for maternity	Total no. used maternity
NHS Lanarkshire *	45	3	**48**	5	0	**5**
NHS Grampian * †	23	3	**25**	2	0	**2**
NHS Highland * ‡	9	2	**11**	12	0	**12**
NHS Tayside * ††	18	2	**18**	2	0	**2**
NHS Greater Glasgow & Clyde	1	0	**1**	0	0	**0**
NHS Orkney	0	2	**2**	0	0	**0**
NHS Western Isles	3	0	**3**	0	0	**0**
NHS Fife	2	0	**2**	0	0	**0**
NHS Ayrshire & Arran	1	0	**1**	0	0	**0**
NHS Forth Valley	1	0	**1**	0	0	**0**
TOTALS †	**103**	**12**	**112**	**21**	**0**	**21**

** 4 people used both pathways; † 3 people used both channels for the same pathway; ‡ 1 person used SMS for maternity, phone for self-management*

The combined data in Table 4 shows that across all the boards, except NHS Orkney, SMS was the preferred channel for the COVID-19 self-management pathway and no-one using the maternity pathway used the phone to interact with the system. Most **people came from four NHS Boards**, with NHS Lanarkshire the biggest user of the system and NHS Highland having the most Maternity users.

The data in Table 5 shows that **44 of these 129 people triggered red alerts and 68 received amber alerts** when using the system. On average there were fewer red than amber alerts and the majority received only one or two. Due to the small numbers involved, exploration of whether they went on to contact the services advised in the alerts (call 111 for amber, 999 for red) has not been undertaken.

Table 5 *– Number of people triggering alerts by their responses to system questions (n=129)*

	Yes	No	Average no. alerts	Range of no. alerts	No. only 1 alert	No. with 2 alerts	No. with 3-5 alerts	No. with 6-10 alerts	No. with >10 alerts
Red alerts	44	85	2.3	1 to 9	23	8	9	4	0
Amber alerts	68	61	3.1	1 to 16	29	12	14	11	2

3.5 HOW WERE PEOPLE'S SYMPTOMS WHEN USING THE COVID-19 SELF-MANAGEMENT PATHWAY?

The patient level data recorded in the Inhealthcare system was combined from 18th March to 12th June, 2022. This included 71 people at the start of their registration and final readings for 64 of them and statistical analysis is not useful for such a small sample. This cohort monitored their symptoms for an average of 8.2 days (range 1 to 17), although **only 11 used the system for 14 days or more**. The others used it either for less than one week (n=27) or 7 to 13 days (n=26).

3.5.1 Breathlessness

When asked if they were feeling breathless, most respondents said they either were not, or were less so than before (Table 6). However, fewer people said their breathlessness had been the same or more than before when they stopped using the system compared to when they started. Only two people said they felt breathless at rest at the start, and this hadn't changed by the end (n=2). Nine people felt more short of breath than usual walking across the room at the start, and only two gave this response at the end.

***Table 6** – First and last responses about feeling breathless*

	First reading	Second reading
Same or more than before	25	5
Not Breathless	37	43
Less than before	9	16

3.5.2 Coughing

Table 7 shows the responses to being asked if they were coughing more than usual at the start and end of monitoring. Fewer people were doing so at the end than they had at the beginning.

***Table 7** – First and last responses about coughing more than usual*

	First reading	Second reading
Yes	16	5
No	53	59

3.5.3 Weakness/tiredness

When asked if they felt much weaker/tired in the last 24 hours, Table 8 shows that more did at the start compared to the end.

***Table 8** – First and last responses about feeling much weaker/tired in last 24 hours*

	First reading	Second reading
Yes	31	3
No	41	61

***Table 9** – Number of people with each first and last resting oxygen level (SpO_2)*

	First reading	Second reading		First reading	Second reading
93%	1	2	97%	12	12
94%	1	1	98%	14	16
95%	4	3	99%	18	13
96%	14	7	100%	1	3

3.5.4 Oxygen saturation

Comparing the first and last oxygen saturation (Table 9) shows that very few people had resting SpO_2 levels below 95%, either at the start or end of monitoring.

These responses show that some of the cohort were experiencing COVID-19 symptoms at the start of using the self-management pathway, but far fewer did by the end, presumably as they were beginning to recover from the disease.

3.6 OUTCOME 1 - DID PEOPLE HAVE A POSITIVE EXPERIENCE OF THE SERVICE?

A standard patient feedback survey was included within the COVID-19 self-management pathway, with closed-response questions covering a range of topics. Unfortunately, patient contact details were not collected for follow-up telephone interviews. This should be prioritised for any future evaluation of pathway use.

Between 5th March and 28th June 2022, 50 people completed the survey. The following summarises the questions and their responses, although not everyone answered them all.

How do you feel about remote monitoring?
31 liked it, *18 said it was OK, 1 didn't like it (n=50)*
How have you found using remote monitoring?
37 found it easy, *8 said it was OK, 2 said it was difficult (n=47)*
Have you had any issues when using remote monitoring?
5 worry about measuring and entering readings correctly, 5 learning to use the system, 1 poor wi-fi or mobile signal, 1 finding someone to help me (n=12)
Have you found any benefits from using remote monitoring?
32 reassured that I'm OK, *4 more worried about my health, 1 learned more about what my results mean (n=37)*
Have you noticed any changes since you started using remote monitoring?
8 less travelling to appointments, 3 see my doctor or nurse less, 2 see my doctor or nurse more (n=13)
What do you think about using remote monitoring in future?
40 use again if needed, *4 be unsure about using it in the future, 1 prefer not to use it again (n=45)*

There is responder bias with this survey because only those who have used the system were able to access the questions, but the results suggest that almost all **people had a positive experience of the service**. They generally **liked it or thought it was OK, found it easy or OK to use, and 32 out of 37 said remote monitoring reassured them that they were OK**.

Only 13 answered the question about any changes they had noticed, which may be linked to the relatively short time they used the pathway. However, many of these travelled less to appointments and three said they saw their doctor or nurse less. In contrast two said they saw their doctor or nurse more.

40 of the 45 who answered the last question said that they would use remote monitoring again if they needed to, although four were unsure about this and one said they would prefer not to.

3.7 OUTCOME 2 – STAFF FEEL ENGAGED AND SUPPORTED

A standard clinician feedback survey has been created for Connect Me and 13 midwives who had used the COVID-19 self-management pathway and given packs to their patients accessed it between 8th and 14th June, 2022. 10 of them worked in NHS Lanarkshire and three in NHS Highland and four had given out more than 10 packs. The 13 who had used the pathway were asked how they found it (Table 10).

***Table 10** – How the midwives found remote monitoring*

	f
Very useful	5
Fairly useful	7
Not useful	1

12 of the 13 midwives had found the pathway fairly or very useful (Table 10) and only one who had used it for one or two patients did not. Five thought remote monitoring was very safe, but six felt it could be safer, one felt it was too soon to say and one wasn't sure. The midwife who wasn't sure explained they were only familiar with the remote blood pressure monitoring pathway, and one who felt the system could be safer noted, *"Some women have attended A&E with poor readings which were found to be normal when monitored there."*

Only one of the midwives had used the clinician interface on the system and had previously said they'd given a pack to one or two patients. They did not answer the question asking for more feedback on the interface. Seven said that the information/resources provided for staff using the system were quite (n=5) or very useful (n=2) and a further four answered not sure/not applicable. Of the 11 who answered the last question, eight would recommend COVID-19 self-management to colleagues, one was not sure, and two said they would not (no explanation was added). These results suggest that **these midwives had engaged with the system, found the information/resources useful and felt sufficiently positive to recommend it to colleagues.**

Of the 13 midwives who had used the pathway, nine felt their patients responded positively and four either had patients who considered the offer but then refused or some they suspected were not interested (Table 11). When asked about explaining the system to patients, eight said most people found it easy to understand, three that some found it difficult to grasp the idea, and one had not had to do this. Eight out of 10 who responded about information/resources for patients said these were quite (n=7) or very useful (n=1). Two were either not sure or said the question was not applicable to them. These results suggest that these **patients responded positively to being offered a pack, most found it easy to understand the processes involved, and the patient information/resources were useful**.

***Table 11** – How the midwives found patients responded*

	f
Most respond positively	9
Some consider, then refuse *	3
Suspect some not interested *	2

** One ticked both responses*

3.8 OUTCOME 3 – REDUCED HEALTH INEQUALITIES

The process for capturing full postcodes for people using the Inhealthcare system is still under discussion due to data protection concerns. However, this detail is sometimes provided with the patient feedback responses, and was for 12 of the 50 respondents to date (see section 3.6). Converting these into Scottish Index of Deprivation (SIMD) quintiles showed that these 12 were spread across the categories, although the numbers are too small to draw any conclusions from. This is data that should continue to be compared to check whether those from disadvantaged and affluent areas can access this system.

3.9 WHAT IS THE PUBLIC'S VIEW ON COVID-19 SELF-MANAGEMENT PACKS AT PRESENT?

To capture some feedback from people being offered COVID-19 self-management currently, an anonymous online survey was designed and accessed via a QR code on the packs. Although the response rate was not expected to be high, there was potential to hear some views from the public. Between 16th June and 26th July, six people completed the survey, four of whom lived in Greater Glasgow and Clyde and two in the Highlands.

Table 12 *– Why people took a pack*

	f
To know when to get help if I needed it	4
To help me manage my symptoms	2
To make sure I was OK	2
I trust the clinician who gave it to me	1
To use at work	1

The first question asked people why they took the pack offered (Table 12) and the most common response was to **know when to get help if needed**. When asked if they planned to use the pack, five said they would, although two said they would not register with the National Contact Centre (one was going to use it at work as a doctor and the other was for an 86 year-old who did not have a computer). The sixth person was not sure if they would use their pack.

No-one who responded to the survey knew of anyone who had refused a pack and two added free text comments. One of these said, *"Available slightly late in the pandemic. May create more unnecessary anxiety for patients and work for clinicians than benefits."* The other said, *"Advice given over O_2 parameters changed whilst using which made it feel like a waste of time. Once admitted to hospital it seemed initial advice was correct."* The fact that they were admitted suggests the pathway did detect deterioration. This person completed the survey shortly before the results were reported, suggesting a very recent experience.

3.10 WHAT DID CLINICIANS THINK ABOUT RECEIVING COVID-19 SELF-MANAGEMENT PACKS?

A separate survey was created for clinicians receiving packs, accessed via a QR code on the most recent batch of healthcare professional leaflets. There was no expectation that many would have time to complete the survey, but it was hoped that some responses would be received to fill the information gap.

Between 9th May and 25th July 2022 18 clinicians completed the survey. 10 were from NHS Greater Glasgow & Clyde, three each from NHS Lothian and NHS Lanarkshire, and one each from NHS Highland and NHS Tayside. Only three said they had given packs to any of their patients.

Table 13 *– Representation of views on packs*

	f
They are/will be very useful for some patients	11
Their usefulness is limited	6
Have not had need/opportunity to use them yet	1

11 of the 18 said the **packs were/will be very useful for some patients**, although six thought this was limited (Table 13). The context was explored by asking about the appetite for COVID-19 self-management packs (Table 14). The main factors were people not contacting health services with symptoms and the public no longer being interested in COVID-19. Three said, *"Helpful but two years too late!", "Many patients have purchased their own pulse oximeters"* and *"False positive rates on oximetry put me off using it."*

Table 14 *– What's affecting appetite for packs*

	f
Many people with symptoms don't contact health services	8
General public no longer interested in COVID-19	7
COVID-19 numbers are reducing	5
Patients say registering with the call centre is a barrier	1
Patients say they don't want to receive text messages	1

3.11 WHO DO CLINICIANS REQUEST ONLY PULSE OXIMETERS FOR?

It was hoped that some of the clinicians who did not have access to COVID-19 self-management packs but were offered pulse oximeters alone would give some feedback in an anonymous survey. Between 24th and 30th June 2022 10 responses were received, seven from NHS Lothian, two from NHS Fife and one from NHS Greater Glasgow & Clyde. Four were GPs, four Practice Managers, and two Nurses. Only one Nurse and one Practice Manager said packs had been given out to patients and one GP said patients had often purchased their own pulse oximeters.

When asked which groups they had requested pulse oximeters for, many ticked more than one box (Table 15), covering **COPD**, **COVID-19 local management**, **other respiratory conditions**, and **where SpO_2 readings were needed for clinical management**. Two of those who wanted them for remote monitoring of COVID-19 symptoms, were from NHS Boards that had declined the offer of self-management packs. One added that it would be used for patients with interstitial lung disease.

Table 15 *– Groups requested pulse oximeters for*

	f
Patients with COPD	8
Patients with COVID-19 symptoms - for local clinical management	8
Patients with other respiratory conditions	7
Where SpO_2 readings are needed for clinical management	7
Patients with COVID-19 symptoms - for remote monitoring	3

Table 16 *– Feedback from patients*

	f
They find the pulse oximeter reassuring	3
They like knowing what their oxygen level is	3
They found it easy to use the pulse oximeter	2

This survey also asked if the clinicians had received any feedback from their patients. Four did so, mostly ticking more than one answer option (Table 16). They found the **pulse oximeter reassuring, liked knowing what their oxygen level was, and found it easy to use**. One noted that they had not yet received any devices.

One noted, *"It would be useful to have pulse oximeters available to enable patients to monitor their oxygen levels at various times throughout the day to assess if home oxygen is required."*

4 WHAT LESSONS SHOULD WE LEARN FROM THE COVID-19 SELF-MANAGEMENT PATHWAY ROLL-OUT IN 2022?

A series of 'lessons learned' interviews was held with key informants involved with the COVID-19 self-management pathway roll-out, full details of which can be found in Appendix 2. The following represent the key points raised that may inform the way forward.

Scotland has excellent working relationships in technology enabled care. These, yet again, formed a solid foundation for progress and were easily expanded to new contacts and networks, at national and local levels

Connect Me enjoyed a high profile at national level aligned to the roll-out. The teams made progress very quickly to amend the pathway, engage with NHS Boards, address information governance, and establish the national on-boarding

The COVID-19 self-management pathway did not increase clinical workload and it gave patients reassurance and support for self-management

Central support was welcomed for answering patient questions/resolving issues and, if continued, would avoid adding to local TEC team workload

BUT

The Omicron variant modelling in December and likely impact on hospital admissions, fortunately, was not borne out

The Connect Me response was pressurised, given the requirement to have a pathway implemented in early January, leaving little opportunity to review and iterate

There may have been too many pathway changes, with associated cost implications. We may have overlooked potentially helpful changes e.g. reducing monitoring frequency for ill patients

Central registration was set up quickly, but there were gaps (e.g. knowing which patients were registered) and a need for work-around solutions (e.g. who had been given packs)

The small numbers using the pathway mean that we have not generated enough evaluation data to add to the remote monitoring evidence-base

There are mixed feelings amongst those involved about the roll-out experience

We do not (yet) have a Once for Scotland approach for remote monitoring. The power of veto may only be overcome if all 14 territorial NHS Boards agree to a system like that used by Research Ethics Committees i.e. one NHS Board completes the full due process, and the others agree to adopt it

We have some valuable learning, but **in order to be ready for the next time** COVID-19 remote monitoring is needed, Scotland would have to **address some cultural issues** (e.g. influential individuals having a profoundly positive or negative effect on adoption) and further explore the **fairly low acceptance of new ways of working**. If this was done, we could realise the full potential of remote monitoring

5. REFERENCES

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[2] *McKinstry B, Alexander H, Maxwell G, Blaikie L, Patel S, Guthrie B (2021) The use of telemonitoring in managing the COVID-19 pandemic: pilot implementation study. JMIR Form Res 5(9), https://formative.jmir.org/2021/9/e20131*

[3] *Scottish Government (2018)* Technology Enabled Care: Data Review and Evaluation Options Study (www.gov.scot)

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Brian McKinstry, 28th June, 2022

This brief high-level review focusses on two large systematic reviews of the evidence[2,4] and a small number of papers published since the data-collection period of these reviews. **It is not a systematic review and it is possible that relevant papers may have been missed.**

Monitoring for COVID-19 may be used in two main ways:

1. to identify early deterioration in affected patients so that they may receive supportive care (oxygen, corticosteroids, anti-inflammatory and anti-viral therapy) which have been shown to reduce mortality and morbidity.
2. to allow early discharge from hospital to free up hospital resources.

The case for anticipatory monitoring of oxygen saturation is based on:

- Evidence that countries that provided supportive treatment for COVID-19 at an earlier stage had better outcomes
- Patients who developed COVID while in hospital (and were presumably observed and managed earlier) had better outcomes despite underlying condition which brought them into hospital
- Evidence that the level of oxygen saturation at first presentation was strongly associated with outcomes.
- Some patients with very low oxygen saturations have few symptoms, but are at high risk of death.

(Goyal et al. (2021)[1] provides a comprehensive case for early identification and treatment)

The case for use of telemonitoring to support early discharge is based on

- Very high pressure on hospital resources
- the relatively frequent relapse rate of patients in the early part of the pandemic due to secondary infection, pulmonary embolus, myocardial infarction and stroke/TIA
- the need to identify and manage these complications in a timely manner.

In many countries, telemonitoring systems were established. These varied considerably in terms of

- *the type of patients that were monitored;* pre- or post- discharge, case selection (some offered the systems to all patients regardless of vulnerability, some focussed on groups which had a higher likelihood of developing pneumonitis)
- *the frequency/intensity and type of monitoring* (telephone based, apps, text, regular follow-up calls, length of monitoring period)
- *The parameters measured* (most measured pulse oximetry and temperature a small number respiratory rate and BP and in addition some asked patients to record symptoms mainly breathlessness, palpitation, fever)
- *The trigger points for patients to seek help*. These were largely based on oxygen saturation and varied from <90% to <95%, but in some cases also included symptom deterioration, pulse rate, respiratory rate, and temperature

Measuring effectiveness and cost effectiveness of telemonitoring for COVID-19

Caveats to be considered

A major challenge in interpreting results from systematic reviews in this area is that they largely refer to studies carried out in the first year of the pandemic. During and after the recruitment period of many of the studies, the virus mutated. Initially this was to more transmissible and possibly more dangerous versions and then more recently to very highly transmissible, but probably less dangerous variants. In addition, effective treatments were introduced over this period, most notably corticosteroids but also novel anti-inflammatories. In early 2021 mass vaccination started which significantly reduced the morbidity and mortality of contracting the virus for most people. Most recently novel anti-viral therapies have become available. In addition, in terms of admissions to hospital (a common outcome measure), highly restrictive admission policies in some countries (such as the UK) were modified, particularly with respect to the oxygen saturation trigger for hospital assessment/admission.

All of these changes are likely to have had an impact on before and after cohort studies (which largely rely on circumstances remaining the same) and the relevance of all studies when the likelihood of hospital admission and death has been greatly reduced. Nonetheless, the results remain of interest as we do not know what form future variants of SARS-CoV-2 will take and if they will evade current vaccination schedules. Significant numbers of people remain un-vaccinated or are immunosuppressed and are still at risk of serious disease.

Vinderola et al.[2] (published June 2021 including papers up to February 2021) aimed to describe and analyse the impact of remote home monitoring models for confirmed or suspected COVID-19 patients, identifying their main components, processes of implementation, target patient populations, impact on outcomes, costs and lessons learnt. They reported models across seven countries including the UK.

They found 27 papers, which were descriptive or cohort studies. Most remote monitoring models were led from secondary care. There was a mix of pre-admission and step-down/discharge models. The majority included relatively young populations (mean age varied from 37.2 to 54.9 years) and only three mentioned risk assessment as an entry requirement. Monitoring was carried out via online platforms, paper-based systems with telephone calls or wearable sensors. Those systems which used telephone calls were considered most inclusive. The authors found it difficult to carry out an analysis because papers reported different outcomes.

Mortality rates were low, probably reflecting the age-groups recruited to studies. Admission or readmission rates varied from 0-29% and ED attendance from 4-36%. Only one article (Grutters et al.[3] a retrospective cohort study of telemonitoring to assist early discharge) reported a reduction in length of hospital stay in comparison to non-telemonitored patients of 5 days. While several studies provided overall costs, no formal cost-effectiveness analysis was performed. Eight papers reported patient feedback which showed very high satisfaction rates. Based on the review the authors noted

- Need for improved co-ordination between primary and secondary care and more involvement of primary care in running/leading the interventions
- While the use of apps allowed follow-up of larger numbers of people, telephone-based systems were considered to be more inclusive
- Lack of attention placed on implementation policies and identification of barriers and facilitators

- Some problems with oximetry due to lack of standard devices, inappropriate use (nail polish, anaemia, haemoglobinopathies, poor peripheral perfusion) due to poor patient training or selection.

They could not reach substantive conclusions regarding patient safety, and the benefit of identification of early deterioration due to lack of standardized reporting and missing data and indicated the need for RCTs and formal cost-effectiveness studies

Alboksmaty et al.[4] (published April 2022 papers up to March 2021) excluded papers which targeted only hospitalised patients, did not measure SpO_2 or exclusively targeted patients <18 years. They included 13 studies of variable quality. There were no RCTs, but two open label controlled studies and 11 uncontrolled descriptive studies. Patients were monitored for a mean 12.7 days using a similar array of monitoring methods to those mentioned in Vinderola et al. Six of these had reminders to self-monitor at varying frequencies. Trigger values for assessment varied between <92% and <94% or a post exercise reduction in saturation of 5% or more.

The review was unable to establish clear evidence for the effects of remote monitoring, but there was a perception that monitoring of oxygen saturation provided a safety-net for home management and aided triage. Oxygen saturation levels alone were responsible for 50% of hospital attendance in one study.[5] There were no formal cost-effectiveness studies. One study (Nunan et al.)[6] which recruited 279 patients with COVID-19 pneumonia confirmed by PCR, chest imaging, and SpO_2 rapid walk test, who would normally have been admitted to hospital, were managed remotely and the authors predicted savings of £640,000 over 6 months based on assumptions of routine bed occupancy (which of course may or may not have happened).

The authors of the review conclude that “pulse oximetry is potentially an effective tool for monitoring deterioration and keeping patients safe at home” and that it was deemed safe. As with Vinderola, they also concluded “Research into the cost-effectiveness of RPM with pulse oximetry is scarce at present, and available data about its effect on the use of health-care services are inconclusive. Further research is needed to inform the future implementation of pulse oximetry in monitoring patients with COVID-19. This research should involve more diverse populations, test the system in resource-limited settings, and assess the effect on health outcomes compared with other systems”

Since these two reviews the following five papers have been published.

Pre-admission studies

Beaney et al. 2022[7] reported the results of a cluster cohort study of the regional impact of implementation of oximetry monitoring in NHS England. The format of the monitoring varied from centre to centre and the overall uptake was low (n = 5527, 2.5% of the eligible population). The period of implementation was not associated with a reduction in mortality, but ED attendance and hospital admissions increased by 12% and critical care admissions by 24%. This change was among the total eligible population and not just those monitored. The results must therefore be interpreted with a great degree of caution. Firstly, with such a low uptake, it is likely that any effects of implementation on overall figures would be minimal. Indeed, in areas where implementation was much higher there was not the same increase in resource use. Secondly, during the before and after period under review the virus

mutated to the alpha variant which was more infectious and deadly, potentially resulting in higher admissions during the remote monitoring period and, lastly, it may be that hospital admission policies changed (as happened in Scotland) resulting in less ill patients being admitted

Lee et al.[8] Set in the USA was the first large scale (n=1217) RCT reported in this area. They recruited from US outpatient clinics. Patients were randomised to either twice daily text monitoring for symptoms with follow-up calls as required or the same service but with added oximetry. They showed no difference in days alive out of hospital at 30 days and concluded no additional benefit from added oximetry. There was an insignificant trend towards increased admissions in the >60yr oximetry group and increased telephone calls in the oximetry group. Several caveats must be considered. The active nature of the remote management of controls in particular make conclusions hard to draw with respect to an intervention versus self-management alone. There is also a potential for contamination as control patients could readily buy oximeters. This was a relatively young population with very low mortality compared with international comparisons, suggesting it was a low-risk population. However, it could be argued that this has some relevance given the low mortality rate currently being experienced in the current wave of COVID.

Lim et al.[9] set in Germany was a cohort study. There were 459 active home-based patients and outcomes were compared with the general outcomes for all patients not using the system in the same area and in four surrounding areas and Germany as a whole. The intervention was app based and collected self-reported symptoms, temp, respiratory rate, pulse and SaO_2 thrice daily; and a nursing team which did a baseline visit and collected blood for c-reactive protein and then visited if app responses suggested the need. The death rate was significantly lower in the active group (0.65% V 2.16%-2.76%($p<0.05$)) particularly among people aged 70+(6.67% v 15.85% $p<0.01$). It was, however, associated with a higher hospitalisation rate (14.8% v 6.9%-7.2%), but these admissions were generally shorter (6 v 10 days.). Some caution is required in drawing conclusions from the data as this was a volunteer study. Although participants had broadly similar baseline characteristics to the general population, there remains potential for bias and seriously ill patients would not have been eligible for inclusion.

Dirikgil et al.[10] recruited 55 patients from the ED in the Netherlands. Patients measured pulse oximetry, temperature and BP three times daily and were phoned or had a VC with a nurse each day. Compared with 110 matched controls 5/55(9%) v 30/110(27%) had a hospital stay, with a reduced overall mean bed occupancy of 10 v 47 days per 100 patients. The biggest reduction was in short stay patients. This is interesting as the usual underlying theory of telemonitoring is that it will detect early illness which may actually increase hospital admissions, but that these will be shorter. However, this study's findings may reflect clinician willingness to continue to manage more seriously ill people at home, confident that they are being carefully monitored.

Early discharge

Van Goor et al.[11] Carried out a RCT of early discharge of 62 hospitalised patients with COVID, 31, randomised to early discharge. These patients were significantly ill with COVID many requiring supplemental oxygen therapy. This was an App based intervention, patients provided 3 x daily SaO_2 pulse, temp. Saturation targets were personalised. The active group had 1.7 more hospital free days in the following 30 days (NS) and 1.6 days fewer in hospital ($p<0.001$) but this was balanced by an increased total duration of care (at home) of 4.6 days ($p=0.028$), however some of this was probably due to the study protocol which called for 48 hours additional monitoring after oxygen stopped in active group, which did not happen in the usual care group. In addition, the research team noted pressure from control patients (disappointed not to be randomised to active treatment) for early discharge.

Conclusion

The evidence that remote monitoring saves lives and reduces over-all hospital stays remains inconclusive. The only large scale RCT was in a relatively young and well population, with an exceptionally low death rate, which compared a fairly intensive form of telemonitoring with a similar service but with added oximetry and concluded that additional oximetry did not improve outcomes and must be interpreted with caution in the Scottish context. Those studies which focussed on patients who were higher risk were generally case control studies but these suggested a positive effect on mortality with either a neutral effect on hospital admission or reduced hospital stays. Evidence from early discharge studies was also generally positive. However, all of these studies were carried out prior to immunisation and the cost-effectiveness of such interventions may have changed. Nonetheless they may still be relevant to un-immunised or immune-suppressed patients and in the context of potential future variants. In Scotland we have targeted the higher risk patients that seem to have benefitted most from these interventions. Remote monitoring appears to be safe and patient satisfaction was universally high in these studies with reassurance a prominent feature.

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1. INTRODUCTION

In response to the rise in cases of the Omicron variant of COVID-19, it was decided to roll-out remote symptom monitoring, to support self- instead of clinical management. The work to ready a tailored version of the pathway began just before Christmas, 2021 and involved some approaches that were new to the Connect Me team. Part of this roll-out evaluation comprised a series of lessons learned interviews with key stakeholders, at national and local levels.

2. METHOD

A proposed list of key stakeholders was approved by the Connect Me project team and invited for interview. They were conducted by MS Teams and recorded for transcription and analysis. All interviewees were assured of the confidentiality of what they said and they gave informed consent. The transcripts were subjected to a form of content analysis; they were read repeatedly to ensure familiarity, common themes extracted and then combined into broad categories for reporting. Due to the risk of interviewees being identified as sole representatives of certain roles or organisations, no direct quotes are included in the analysis and details of who took part have been withheld.

3. RESULTS

Of the 15 people invited for interview, one felt they had not been involved to a sufficient degree to take part, but seven participated and one submitted written comments in response to the questions. The eight respondents represented both local and national organisations and included members of the Bronze Group overseeing the roll-out and NHS Board staff implementing it. Interviews were conducted between 23rd May and 1st June, 2022 and lasted an average of 20 minutes. As with all qualitative analysis, some of the views expressed were unique to certain interviewees and at times in conflict with other opinions or recollections. All perspectives are valid and have been taken into account, to ensure as full an understanding of the roll-out as possible.

3.1. DRIVERS FOR ROLL-OUT

3.1.1 Modelling

By Christmas 2021 it was predicted that there could be up to 100,000 cases of the Omicron variant each day. Contingency plans were needed to avoid the whole system becoming overwhelmed. However, some felt it was evident in early January 2022 that the demand on services was considerably less than predicted. Omicron variant was less severe than anticipated so the COVID-19 self-management pathway would not be required for huge numbers of patients. While some thought that this was only evident with the benefit of hindsight, not everyone agreed.

3.1.2 Pressurised working

By 23rd December there was pressure from Scottish Government to create virtual capacity, with remote monitoring potentially the quickest thing that could be stood up. People were pulled in to get it ready and felt they had to work during their Christmas/New Year holidays, dropping other things to focus on it.

3.1.3 Working at pace

Work to ready the COVID-19 self-management pathway was done at such a pace that there wasn't time to test it fully and the sense of urgency led to a feeling of firefighting. The processes were observed as reactive, demanding, and not how a team would want to work.

3.2 DRIVERS FOR CHANGING THE PATHWAY

3.2.1 Omicron symptoms

Whilst the emergence of the Omicron variant was a driver for changing the pathway, it turned out to be less serious than it could have been, causing fewer hospital admissions. People with Omicron were less likely to be in contact with their GP or health services at all, and the smaller number admitted to hospital more likely to need active treatment rather than self-management. This was not known at the start of pathway planning, but if there had been the same level and type of morbidity as previous variants, the roll-out pathway would have been useful for a larger number of patients. Omicron turned out to be associated with fewer respiratory problems.

3.2.2 Pathway readily available

COVID-19 remote monitoring was seen as a quick win at first because it had already been tested and used by some NHS Boards in 2021. Had this version, even with minor tweaks, been rolled-out it could have gone live earlier.

3.2.3 Impact on clinicians

In the context of expecting large numbers of Omicron patients, it was recognised that clinical staff would be too busy to on-board patients to the system on top of the other demands on their time. The desire to release them from this administrative task required the design of a new approach, with a focus on self-management by patients without any alert monitoring by clinicians. There was also a change to community management with the closure of COVID-19 Assessment Centres (CACs) and GPs becoming more involved in the review of suspected COVID-19. Remote monitoring would allow GPs to give pulse oximeters to their patients, provide oxygen saturation readings to inform decision-making, and enable patients to follow pathway or leaflet advice without contacting their GP.

3.2.4 Impact on patients

The potential for COVID-19 remote monitoring to provide reassurance for patients was seen as a major advantage of the system, along with them being supported to quickly access any help required when self-managing. Patients could have this reassurance without registering on the system, though, as the information leaflet included trigger levels for when to seek help. The NCC support for answering patient questions/addressing their issues was welcomed and felt to have relieved a burden that would otherwise have fallen on local Technology Enabled Care (TEC) teams.

3.3. IMPLEMENTING CHANGE

3.3.1 Profile of remote monitoring

The pressure to create virtual capacity to cope with the projected increase in Omicron cases gave remote health monitoring a very high profile for a time. It also enabled connections to other parts of government e.g. the Chief Medical Office seeing the contribution that remote monitoring could make, raising the importance of this work. However, the profile of other planned interventions subsequently overtook that of remote monitoring. The changes also provided an opportunity to promote the new Connect Me branding, although this added to the project team's work as they needed to ensure it coincided with the launch of the self-management service.

3.3.2 Pathway changes

It was acknowledged that all the changes to the COVID-19 pathway amounted to a considerable volume of work, although much was achieved in a relatively short period of time. The main change to the pathway was introducing a central on-boarding function by the National Contact Centre (NCC), comprising a new freephone number, integrating NCC systems with Inhealthcare, and supplier review and build. Other changes involved rewording some of the patient advice messages, restricting channel options to SMS text or automated telephone calls, and system report developments. This level of change was expensive, as revising the pathway build incurred a cost. It may also have led to people thinking that any desired changes could be incorporated.

New information governance approval (time-consuming and never easy) was needed for the NCC to handle patient identifiable data, along with a means of resolving the discovery that some NCC staff did not have network access for secure information transfer. Negotiation was required in the background, often for things that had appeared relatively simple at first, but turned out to be technically complex.

It was also necessary to acquire and create a means of distributing a large number of pulse oximeters and patient information leaflets to those being advised to self-manage their COVID-19 symptoms. These were combined in a patient pack, assembled and distributed by National Services Scotland, in response to requests submitted to the project team.

3.3.3 Too many processes

The way of determining how many packs were needed in each NHS Board area was one example of the different processes surrounding the COVID-19 self-management pathway. It was suggested that people could have ordered them directly, much like COVID-19 test kits, although a mechanism for doing so would have been required, along with some form of gatekeeping to ensure only those advised to monitor received a pack.

It was felt the letter offering packs to NHS Boards needed high level sign-off, which took some time, and had to be handled carefully in case GPs felt that asking them to give out packs increased the pressure of their workload. It was suggested that the process or linking with a strategic lead in each NHS Board and through them to frontline clinicians was a little cumbersome.

3.3.4 Lack of data about packs

Due to the nature of the new pathway, there was no need for clinicians to stress that their patients should register with the system, via the National Contact Centre. Without this it is impossible to know if patients have used their packs without registering, or simply discarded them. Central registration via the NCC also meant that local areas had no data on how many of their residents had been offered a pack or gone on to use one, because they had no direct involvement with the patients.

3.3.5 Limited scale-up

Although the pandemic was on the decline by the time the pathway went live, other factors also influenced the limited scale-up to more people with COVID-19. It had been piloted within General Practice and shown not to increase GP workload, as some thought it might and local areas described the

positive reception they'd received from GPs as they explained this. Some local teams were able to scale-up to other patient-facing services, including Emergency Departments, Obstetrics, Out of Hours services and to support safe, earlier hospital discharges.

Others felt it was more difficult for Emergency Departments to use the pathway, since so few people presented there and it might be viewed as adding to their workload for little gain. In addition, some NHS Board Medical Directors had refused to allow pack distribution, thwarting pathway scale-up. It was noted that some of the GPs in these areas had since requested pulse oximeters for their patients, without intending to use the pathway.

3.4. WHAT STAYED THE SAME

3.4.1 Good working relationships

Many of the changes described above were made possible by the strong working relationships that had already been developed by the Connect Me project team. Besides the mutual respect within the team, they had already worked with some of the key organisations supporting pathway roll-out, including NHS National Services Scotland (NSS) Integration and Distribution teams, the national pathway supplier, clinical leads, and some of the NHS Boards who had used the previous pathway. They established new working relationships with the wider Technology Enabled Care (TEC) programme, including the Near Me video conferencing team and their networks, which increased pathway development capacity. Links were also made to others who might deploy the pathway, such as the Scottish Ambulance Service, Out of Hours services and Emergency Departments. But these new relationships were not exclusively helpful, particularly when there was confusion about who was leading specific strands of work and who was there to support them.

Reliance on good relationships was also apparent at the local level, both linking to national developments and with colleagues who might use the pathway. This influenced both the adoption of the pathway in clinical settings and the ability to bridge a gap between national and local contacts, being trusted by both parties when they didn't know each other.

3.4.2 Clinician workload

At the local level it had been vital to be able to show that using the new pathway did not increase clinical workload. Piloting it in one area allayed fears that the trigger levels would result in lots of people contacting their GP. Feedback from GPs was positive, showing any contacts were appropriate and that it was useful to have oxygen saturations to inform decision-making. Another area was able to test the pathway and tell local clinicians that it was fully functioning and allowed patients to self-manage without their intervention.

3.4.3 The day job

While some members of the Connect Me project team worked on the roll-out pathway, the rest continued to work on the other conditions in the portfolio i.e. the day job. It was noted that the ongoing changes being made to the COVID-19 pathway had an impact on progress with the rest of the programme.

3.4.4 Monitoring frequency

One more thing that stayed the same was the frequency of monitoring that was built into the pathway i.e. twice a day completion of a fairly lengthy questionnaire for 14 days. This may have influenced length of pathway use, as some using the 2020/21 version said they tired of entering readings.

3.5. HOW WAS ALL OF THIS EXPERIENCED?

3.5.1 Feelings

When asked if they had enjoyed being involved with pathway roll-out, the interviewees gave mixed responses. Few expressed a feeling, with most preferring to sum-up their reflections on the experience in one or two words. These included that the pathway was a good thing, unsatisfactory, chaotic, rewarding, challenging, frustrating, or that they were ultimately disappointed.

3.5.2 Timing

Despite recognising the value that remote monitoring could have added, there was a strong sense that the pathway was ready to be deployed just as the number of cases was declining. It was noted that this was the second year in a row this had happened.

3.5.3 Evaluation

In the absence of robust evaluation, it was felt we would never know what difference pathways were making. The focus should go beyond what had been successful, to highlight what hadn't worked and what might need to change to make things better and had to include feedback from frontline clinicians and patients using the pathways. There was a sense that comparing the amount of effort that went in to developing this pathway with the number of people who had used it showed it had not been worth it. If we'd had bigger numbers we may have been able to add to the evidence-base around proving whether or not COVID-19 remote monitoring pathways make a difference e.g. by saving lives.

3.5.4 Once for Scotland

Approaching information governance in a Once for Scotland way was recognised as helpful, but there were other parts of the pathway that could have benefited from this. Holding 14 separate discussions with the territorial NHS Boards, and some of them having the power of veto over whether or not individual clinicians would have access to the pathway/packs was viewed as unhelpful. In order to be more agile, Scotland would benefit from a better system, possibly delegating scrutiny to one NHS Board on behalf of the others, in a similar way to how NHS research ethics committees operate. Currently influential individuals can have a profoundly positive or negative effect on adoption.

3.5.5 Spread

Whilst it was felt there had been a lot of learning from this roll-out experience and potential for applying some of it to other conditions/pathways, aspects of the work had been about trying new things that turned out not to be as useful as might have been hoped. While the centralised point of contact for registration was thought to have been useful for some things e.g. supporting people using the pathway, there was doubt as to whether or not introducing this into other pathways would save clinicians time.

3.5.6 Ready for next time?

One of the themes that recurred in these interviews was that the efforts to date would stand us in good stead to deploy the pathway quickly, should there be another COVID-19 wave in future. But questions were posed around whether or not we would want to do things in the same way again. Some were not confident that the current version of the pathway was ready, had been fully tested, or was fit for purpose. It would certainly not be something that could be quickly deployed again if considerable changes were requested. It was suggested that more profound shifts in culture and acceptance of new ways of working were what was needed, rather than assuming that greater scale-up or spread could be engineered from the limited testing to date.

4. DISCUSSION

An overview of the main things learned from the stakeholder interviews is included in the body of the evaluation report, but in reviewing these it needs to be remembered that the results come from the sample of those invited who were able to participate. It is always possible with interviews that the themes emerging are not representative, but they should be viewed as the valid reflections of those who took part. In the interests of completeness, all the views expressed were given equal weight in the analysis, which may also mean that some stakeholders do not agree with the resulting lessons shared.

In summary, there were some strong positives from the roll-out of the COVID-19 self-management pathway, such as celebrating the excellent working relationships Scotland has in technology enabled care, a raised profile for Connect Me, and the reassurance that people using the pathway felt.

The interviews have also highlighted a number of issues that should be addressed or explored in more detail to ensure a fuller understanding of the issues involved. In relation to the evaluation, the move to central registration meant that it was not possible to obtain patient contact details for interview, or follow on use of services, and the small numbers using the pathway affect how confident we can be about its impact. Those involved in pathway development described a mix of positive and negative feelings about the experience, much of this related to how pressurised the requirements were around Christmas 2021, but also to the ongoing changes made to the pathway over time. The absence of a 'Once for Scotland' approach and acceptance of the pathway may stop us realising its full potential.