Evaluation of the use of remote monitoring technology in care homes in London

April 2023

Health
Innovation
Network
South London

Acknowledgements

Contents

1. Executive summary

Overview

Following the first wave of Covid-19, the five Integrated Care Systems (ICSs) in London came together with the support of NHS England London Region's Digital First team, to discuss how to procure and deliver remote monitoring technology for care homes across London. These developments were made possible utilising funding received from NHSX. It was agreed that the Health Innovation Network (the HIN, the Academic Health Science Network for south London) would be commissioned to deliver an evaluation of the implementation of remote monitoring.

The purpose of the evaluation was to gain a better understanding of the usage and potential impact of remote monitoring technology in the care of residents in care homes in London, and to generate insights to help commissioners and delivery teams design and deliver digital tools in the care home sector in the future.

Each ICS adopted a different product(s) and implementation model. Six technologies were initially implemented during this programme of work, four of which were adopted and in use by 31 December 2021. One ICS did not pursue remote monitoring in care homes; this evaluation therefore focuses on four London ICSs, namely South West, South East, North Central and North East Integrated Care Systems.

The data collection period for this report concluded in December 2021, and findings relate to experiences up until this date.

Separate work has been undertaken to evaluate the implementation of remote monitoring in care homes in some parts of London. These studies are referenced in the conclusion and appendices, and it is recommended that these are read as a supplement to this evaluation.

Key findings

Remote monitoring technologies became operationally live (defined as conducting assessments at least once a month on average between the month of their first care home resident assessment and December 2021) in a total of 173 care homes across four London Integrated Care Systems.

The technology was successfully embedded: of the 173 operationally live homes, 127 care homes were still using remote monitoring in December 2021.

The majority of care home staff reported that remote monitoring benefitted them, residents and the wider healthcare system. However, some staff felt it increased overall workload for care home staff and GPs.

Overall, the training to use remote monitoring was well received by care home staff, who found it useful and felt quite confident to use the technology in their care homes.

Unfortunately, the response rate from a GP survey regarding remote monitoring was low with only 11 responses, but seven out of 11 felt that remote monitoring information had helped them to care for residents and that it

improved the delivery of healthcare for residents.

All GPs responding to the survey agreed that they would recommend that other care homes take up the use of remote monitoring solutions to care for residents.

Data on healthcare utilisation, ambulance data and emergency hospital activity were compared between homes with and without remote monitoring technologies in place, but the data did not yield any observable pattern from which to understand the impact.

Interviews were held with the ICS delivery teams to understand the wider factors which could enable greater spread and adoption of remote monitoring. This highlighted key themes such as the importance of early engagement with the full range of stakeholders, providing dedicated support to care homes implementing digital solutions from outreach teams, having readily available technology tailored to the needs of care homes, and drawing up clear implementation plans with realistic timelines.

Recommendations

The following recommendations are made from the analysis of remote monitoring usage, the surveys of care home staff and GPs, from the healthcare utilisation data, and the interviews with lead staff from the four London ICSs.

It is recommended that:

1. Integrated Care Boards (ICBs) continue to implement remote monitoring in care homes in London. This recommendation is based on utilisation data which showed that generally the technology was successfully embedded, and qualitative findings from the surveys which showed that care home staff felt that it was beneficial overall.

2. Further analysis of healthcare utilisation data is conducted in 12 months' time to better understand the impact. Further exploration of the impact on GP workload, and experience of care home staff and clinicians supporting care homes should be undertaken. Where any further evaluation takes place, an agreed model of use for remote monitoring in care homes should be in place to allow for a better understanding of the impact of the technology on healthcare utilisation.

3. Where any ICBs plan to implement remote monitoring in care homes, they should ensure dedicated resource and an implementation plan is agreed by local stakeholders. This will maximise the potential for effective implementation and sustainability of the technology. Systems should consider the different support approaches already tried and tested (use of outreach staff such as Digital Integration Support and Liaison Officers (DISLO), nurse educator etc.) and agree an appropriate approach for their area. Moreover, ongoing engagement with the full range of stakeholders should be prioritised, including residents and their families as this is key to successful implementation.

A summary of all recommendations is shown overleaf:

- **Repeat healthcare utilisation data analysis** once care homes and systems have had sufficient time to embed remote monitoring

- Consider the **model or use cases for remote monitoring** when interpretating any observed impact on healthcare utilisation

- Conduct **further qualitative work** (interviews) with care home staff and the wider healthcare system to more fully understand the impact of remote monitoring

- Explore the impact of remote monitoring on **GP experience and workload**

- Collect **patient case studies** to understand how remote monitoring has impacted residents

Further evaluation

- Ensure there is **dedicated resource** for implementation. Consider the support approaches already tried and tested (e.g. DISLO, nurse educator roles etc.)

- Allocate **adequate time** (months not weeks) for procurement

- Agree strategies for **ongoing engagement** and continued buy-in from stakeholders. Consider how **residents and their families** will be engaged

- Establish **clear governance structures and reporting responsibilities** in the early stages of the programme

- Encourage **continued sharing of training resources and lessons learnt** at local regional and national level

- Specify to remote monitoring suppliers which units of activity to record - so data can be interpreted in a meaningful way

Implementation tips
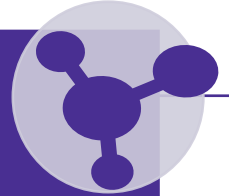
2. Background

Following the first wave of Covid-19, NHSX partnered with the national Academic Health Science Network (AHSN) to establish a National Innovation Collaborative to rapidly share learning and best practice in digital transformation across the NHS and care sector. This was a clear priority to support the care of people remotely during the pandemic. As part of this initiative, NHSX provided implementation funding to the seven regions of NHS England to scale projects that use technology, devices or apps to support the monitoring and management of people's health at home or their place of residence.

The five Integrated Care Systems (ICSs) in London came together, with the support of the London Digital First team, to focus on use of NHSX funding to develop and deliver remote monitoring technology in care homes across London.

The Covid-19 pandemic created major challenges for care homes as staff received limited face-to-face contact from the healthcare services who would normally support them. Whilst it was anticipated that many patient-facing services would revert to previous ways-of-working after the pandemic, the potential for remote monitoring systems in social care settings to provide both short and long-term benefits was recognised.

A rapid review[1] commissioned by NHS England London Region and published in November 2021 by the Health Innovation Network, summarised the available evidence on the use of remote technology in care homes in the UK. The review highlighted the low volume of published evaluations and case studies available, and therefore the importance of the London Innovation Collaborative and its outputs.

The aim of the Collaborative was to improve the digital infrastructure of care homes, establish remote monitoring technologies to help recognise the deterioration of residents' health and improve the care available, and allow learning from each approach to be shared across London's health systems. The roll out of the remote monitoring technology was not limited to a particular care home setting (Older person's (OP)/Learning Disability (LD)/ Mental Health (MH)/Nursing) and this was at the discretion of the ICS delivery teams.

It should be recognised that this programme of work was delivered during the Covid-19 pandemic, a time when care homes and supporting health services faced huge pressures and uncertainties and they were also engaged in numerous other activities such as mass vaccination programmes.

Unsurprisingly, this programme experienced several delays and challenges. These affected the original project timeline for implementation of remote monitoring technology and resulted in a number of changes to the original programme plan, two of which are important to note here for the evaluation:

  (i)   North West London ICS pivoted their focus to the implementation of remote monitoring technology projects for long term conditions. This work is therefore not included in this evaluation which focuses specifically on care homes.
  (ii)   A strategic decision was made by the South East London ICS programme to withdraw central support for the ARC implementation as the solution was not deemed ready for roll out. SEL ICS continued to implement another product, Docobo.

Each ICS was given the opportunity to develop their own criteria for the technology to be used in their area, and procurement largely took place through the Spark Dynamic Purchasing System at a local level.

Programme design and delivery, as well as care home selection, took place at local level. This allowed flexibility for each ICS to:

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[1] Innovation-Collaborative_Rapid-Review_Health-Innovation-Network.pdf (healthinnovationnetwork.com)

- scale any remote monitoring technology solutions already in use,
- identify and introduce their own pathways and technologies,
- develop staffing structures and training programmes appropriate for their area.

The different approaches taken are detailed in the findings section for each ICS.

An interim report[2], focused on progress with early implementation, and pre-implementation views of care home staff regarding remote monitoring views of implementation of remote monitoring was published in November 2021.

2.1. Evaluation purpose and design

2.1.1. Purpose

This evaluation was commission in order to gain a better understanding of the usage and potential impact of remote monitoring technology in the care of residents in care homes in London, and to generate insights to help commissioners and delivery teams design and deliver digital tools in the care home sector in the future.

More specifically, it aims to answer the following evaluation questions:

- Was the technology used when implemented?
- Did care home staff feel confident using the technology?
- Did care home staff perceive benefits?
- Did the use of remote monitoring technology impact healthcare utilisation?
- What factors are essential to make the model effective to enable greater spread and adoption?

2.1.2. Scope

The evaluation aims to understand the general effect of remote monitoring technologies that are being used in care homes across London, rather than to assess or support any specific technology/solution. The evaluation encompasses perspectives of those who engage with the platforms (care home staff and GPs) and delivery teams within the ICSs.

2.1.3. Design

The evaluation took a mixed methods approach, collecting and analysing qualitative and quantitative data to assess the potential impact and learnings from the programme. The following data were collected:

- Survey data from care home staff and GPs (February – March 2022). NB Findings of an earlier survey of care home staff undertaken at the beginning of the programme is referenced separately, in the Interim Report published in November 2021.
- Interviews with ICS delivery teams (March 2022).
- Healthcare utilisation data (London Ambulance Service and hospital activity) – up to December 2021.
- Supplier usage data –up to December 2021.

Table 1 sets out the range of metrics and data collection methods used to answer each of the evaluation questions.

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[2] PowerPoint Presentation (healthinnovationnetwork.com)

Table 1: Evaluation framework

	Evaluation question	Measures / metrics	Data source / collection method
1	Was the technology used when implemented?	- Number of care homes with usage data - Number of observations undertaken (N.B observations was referred to variously by different suppliers as check-ups/observations/ assessments)	- Usage data provided by suppliers
2	Did care home staff feel confident using the technology?	- Feedback from care home staff	- Survey of care home staff (Distributed by ICS teams)
3	Did care home staff perceive benefits?	- Feedback from care home staff and GPs	- Survey of care home staff - Survey of GPs (Distributed by ICS teams)
4	Did the use of remote monitoring technology impact healthcare utilisation?	- Number of LAS incidents and conveyances - Number of A&E admissions - Number of non-elective hospital admissions - Number of readmissions - Length of stay (LoS) for non-elective admissions and readmissions	- LAS data - Hospital activity data
5	What factors are essential to make the model effective to enable greater spread and adoption?	- Feedback from ICS delivery teams	- Interviews

3. Findings

3.1. North Central London

3.1.1. Overview of model

Table 2: Overview of North Central London ICS model

Aim	North Central London (NCL) ICS focused on expanding the use of a system which had already begun to be tested in its area - the Whzan[3] Blue Box. Alongside the implementation of this technology, a vital signs education programme was implemented for care home staff, led by nurse educators.
Product and Use	The Whzan Blue Box contains a thermometer, pulse oximeter and blood pressure monitor. The instruments are Bluetooth-enabled and transmit readings to a Tablet; options are also available for Wi-Fi or 3/4/5G use. Care home staff access NEWS2 scores through the Tablet. Data can also be reviewed from the cloud via a portal, and clinicians were provided with individualised log ins to enable them to view the observations. Model of care: Care home staff took observations for residents on a monthly basis, and additionally if they were worried about a resident or when a clinician/resident/relative requested them. Care home staff communicated and escalated any concerns to healthcare staff as appropriate (based on NEWS2 score), for example by contacting the GP by telephone who could then log in to Whzan to view the observations.
Staffing Model	The project team for implementation consisted of a clinical lead and a project manager. Six nurse educators including a nurse manager worked together with care homes and GPs to deliver training and promote uptake of remote monitoring. A mixture of face-to-face and virtual training was delivered.
Additional support provided	Nurse educators trained staff to use the Whzan equipment, while 'super users' in each care home received additional support to enable them to support and up-skill colleagues. As well as supporting remote monitoring, the nurse educators had additional roles for example providing clinical training across Adult Social Care (ASC) staff, preventing delayed hospital discharges and unnecessary hospital admissions, placement breakdown etc. The clinical lead worked with clinicians across the healthcare system to develop new pathways for remote monitoring. They also had a wider role in care homes (beyond remote monitoring) to help raise the standard of care e.g. by enhancing clinical reviews for care home residents.

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[3] Virtual Wards | Whzan digital health | United Kingdom

3.1.2. Was the technology used when implemented?

In North Central London, 74 care homes trialled Whzan between November 2020 and December 2021; of these, 68 care homes were operationally live (defined as care homes that were using Whzan to conduct resident observations at least once a month on average between the month of their first resident observation and December 2021). The definition of an observation on Whzan means either a full or partial set of observations taken i.e. this could include a full set of tests or just one test (such as a temperature check) being carried out.

One care home was operationally live prior to the pilot. Other care homes started using Whzan from November 2020 and a steady increase in care homes going live was observed up until December 2021 when the 68th care home started using Whzan. The steady increase in care homes that had introduced Whzan is shown by the vertical bars in figure 1.

Figure 1 also shows how many care home residents had observations taken each month using Whzan. Unfortunately, the Whzan data supplied did not include the total number of observations per resident per month but it is likely that some residents had more than one observation taken in a month. A progression is seen in monthly residents with observations as more care homes went operationally live at the beginning (November 2020-May 2021) of the data collection period.

Figure 1: No of operationally live care homes by no of residents with observations – monthly time trend
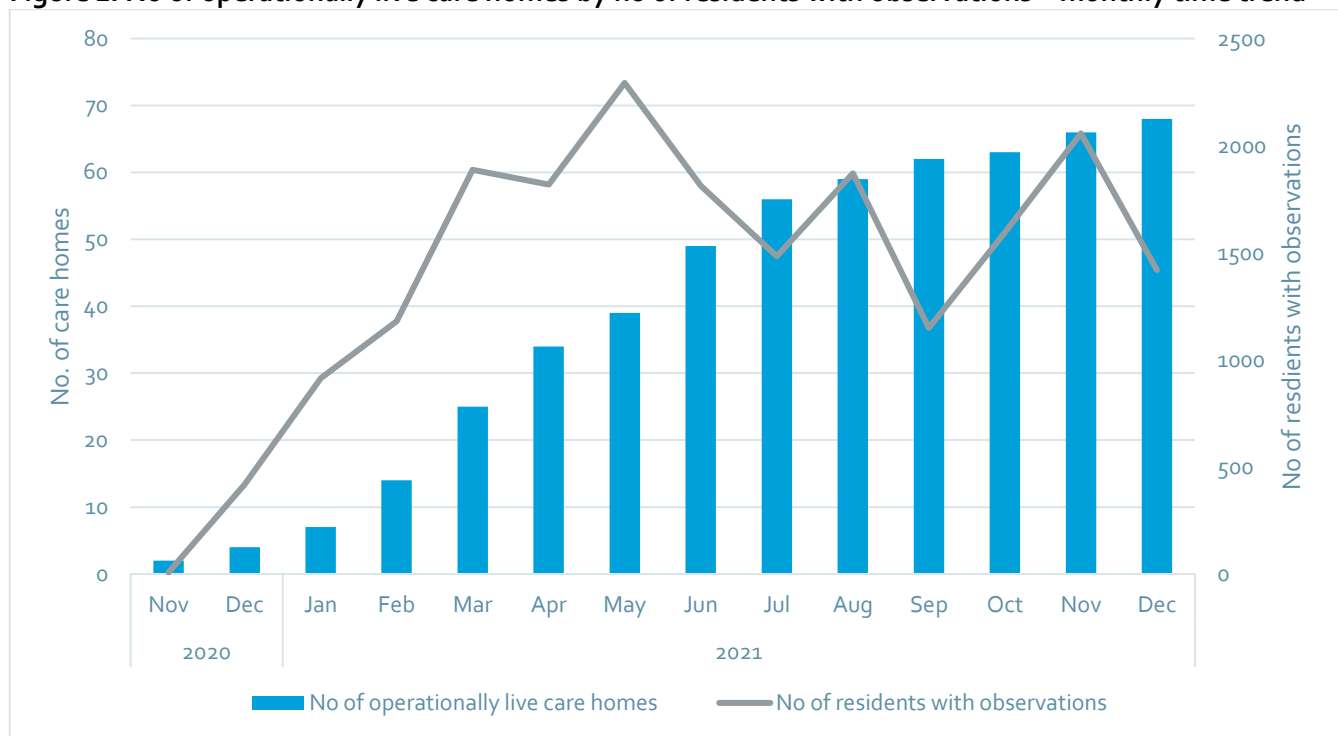
On average (median) there were seven residents with observations per care home per month throughout November 2020 and December 2021, with an interquartile range of 29.

As shown in Figure 2, the number of residents with observations taken per care home each month varied month on month and over time. Toward the end of the period (July onwards), there was an increase in the number of care homes not using Whzan, and reduced numbers of care homes doing observations of 20 or more residents in the month. This contrasts with April and May 2021 where most care homes were doing observations on 20 or more residents.

By the end of the pilot (December 2021) the majority of care homes were still using the Whzan technology, with three-quarters of operationally live care homes performing observations for one or more resident in December.

2021. (Figure 2).

Figure 2: No of care homes by no of residents with observations carried out per care home per month – time trend
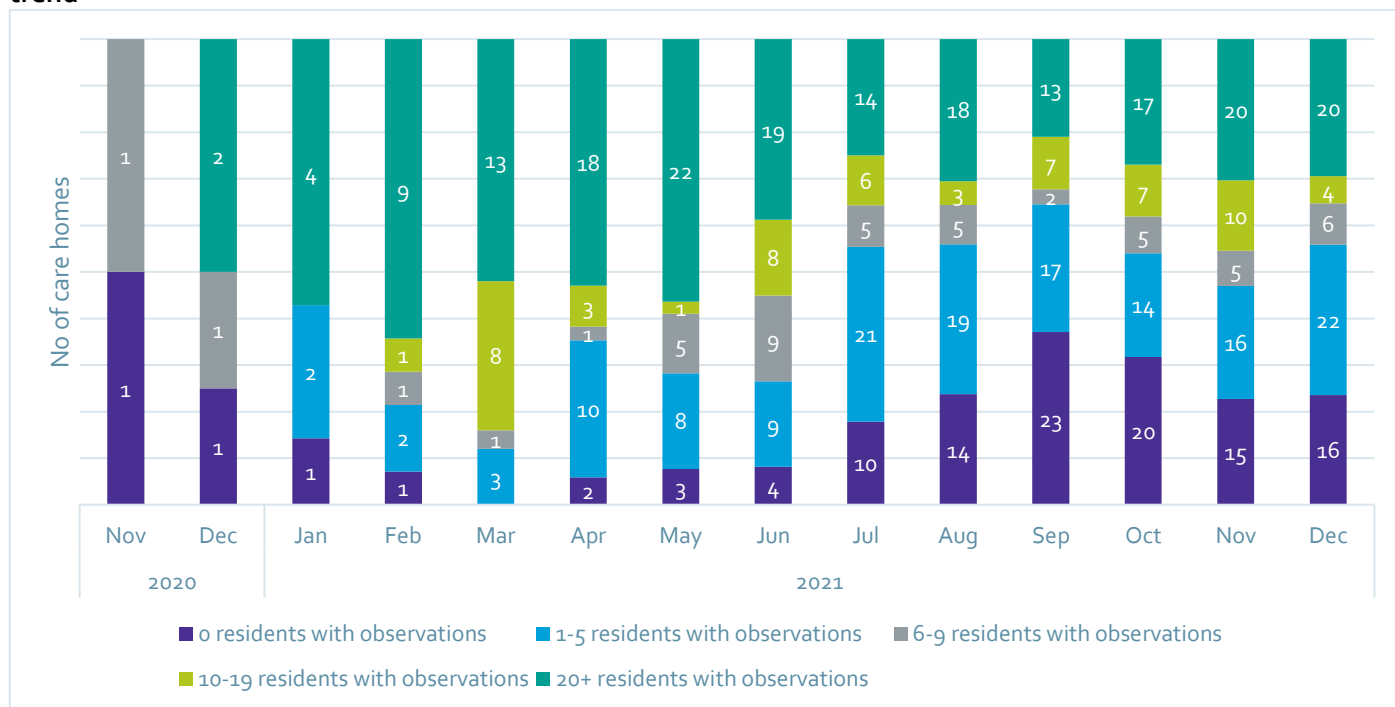
3.1.3. Did care home staff perceive benefits?

A survey was sent out on 3rd February 2022 to care staff working in each of the care homes that implemented a remote monitoring solution to gain their views. The analysis below is of the views of care home staff post implementation of the remote monitoring solution.

A total of 30 members of staff working in care homes in North Central London responded to the survey, including 12 registered managers, eight deputy managers, five carers, four nurses and one team leader. All survey responders had used the remote monitoring solution available in their care home.

A large proportion of survey respondents felt that remote monitoring solutions in care settings had benefitted staff (19), residents (20) and the wider healthcare system (20).

See also separate work undertaken by the NCL team referenced in the conclusion which shows the benefits of remote monitoring perceived by staff and residents at a care home for people with learning disabilities.

Figure 3: Staff perception: has remote monitoring brought benefits?
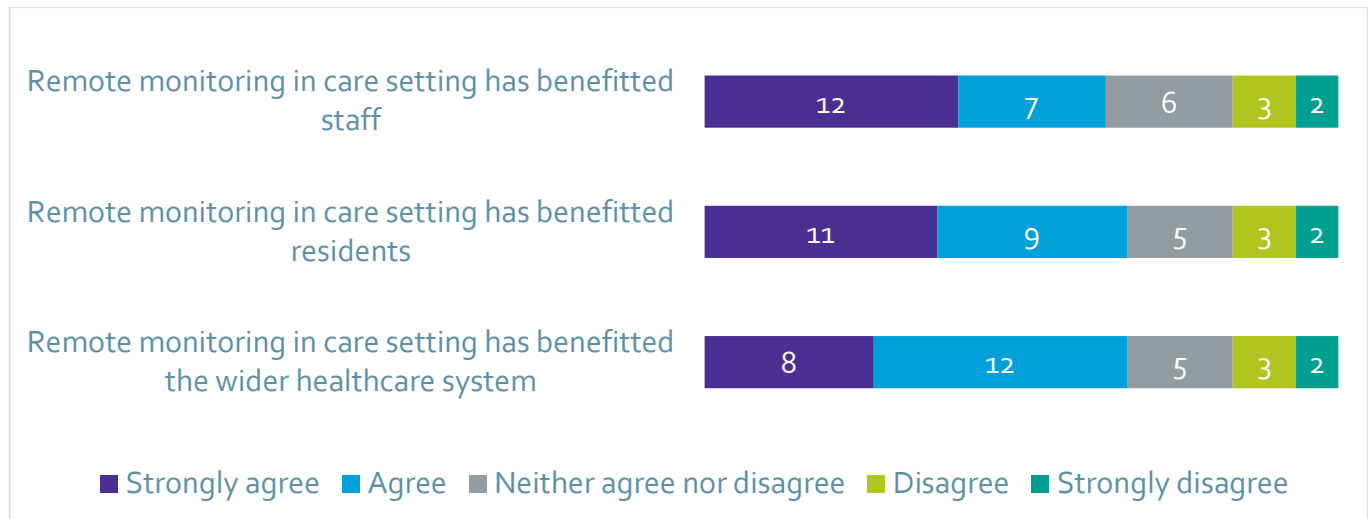
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Remote monitoring in care setting has benefitted staff	12	7	6	3	2
Remote monitoring in care setting has benefitted residents	11	9	5	3	2
Remote monitoring in care setting has benefitted the wider healthcare system	8	12	5	3	2

Respondents were asked if they felt the remote monitoring solution adopted in their current care setting had changed the way they care for residents, resulting in mixed views. Half (15) of respondents felt it had, whilst 13 respondents felt it had not and two respondents were unsure.

Seventeen respondents provided further comments when asked to share any thoughts related to their answer. The comments received were mixed- the positive ones referring to how remote monitoring had made staff feel reassured about the care they were providing to residents, which also reassured residents' families. Staff were able to detect deterioration sooner and could take quicker actions, as noted by one of the respondents:

> *"It has been really helpful especially in identifying a case of sepsis with one of our residents who had different temperature readings, this helped us to quickly make a decision for hospitalisation."*
> Care home Deputy Manager

Respondents also reported that remote monitoring made it easier for them to communicate with GPs and other Multi-Disciplinary Teams (MDTs) as they were able to share real time data with them. However, it was also reported that it increased the workload of staff. Two respondents reported problems with poor connection.

Views were mixed in terms of the role of remote monitoring in improving relationships between staff, relatives, and residents, with 13 respondents agreeing this had improved as a result of remote monitoring, nine neither agreed or disagreed and eight disagreed.

Similarly, when asking care home staff whether the quality of communication between care home staff and primary care had improved, 12 agreed it had, eight neither agreed nor disagreed and 10 disagreed. One of the registered managers further commented:

> *"I have seen first-hand another provider (paramedic) from the GP service use the News2 score and it was nice to see that we could work in collaboration."*
> Registered Manager

A slightly higher number of care home staff agreed that communication between care home staff and emergency services had improved (14), with eight respondents neither agreeing or disagreeing and eight disagreeing. One of the registered managers further commented:

> *"We were able to get a person to hospital when we had completed the remote monitoring with a person and 999*

Figure 4: Staff perception: impact of Remote Monitoring on relationships and communication

I feel the relationship between staff, residents and relatives has improved	1	12	9	5	3
I feel the quality of communication between care home staff and primary care has improved	1	11	8	7	3
I feel the quality of communication between care home staff and urgent / emergency services has improved	4	10	8	5	3

■ Strongly agree ■ Agree ■ Neither agree nor disagree ■ Disagree ■ Strongly disagree
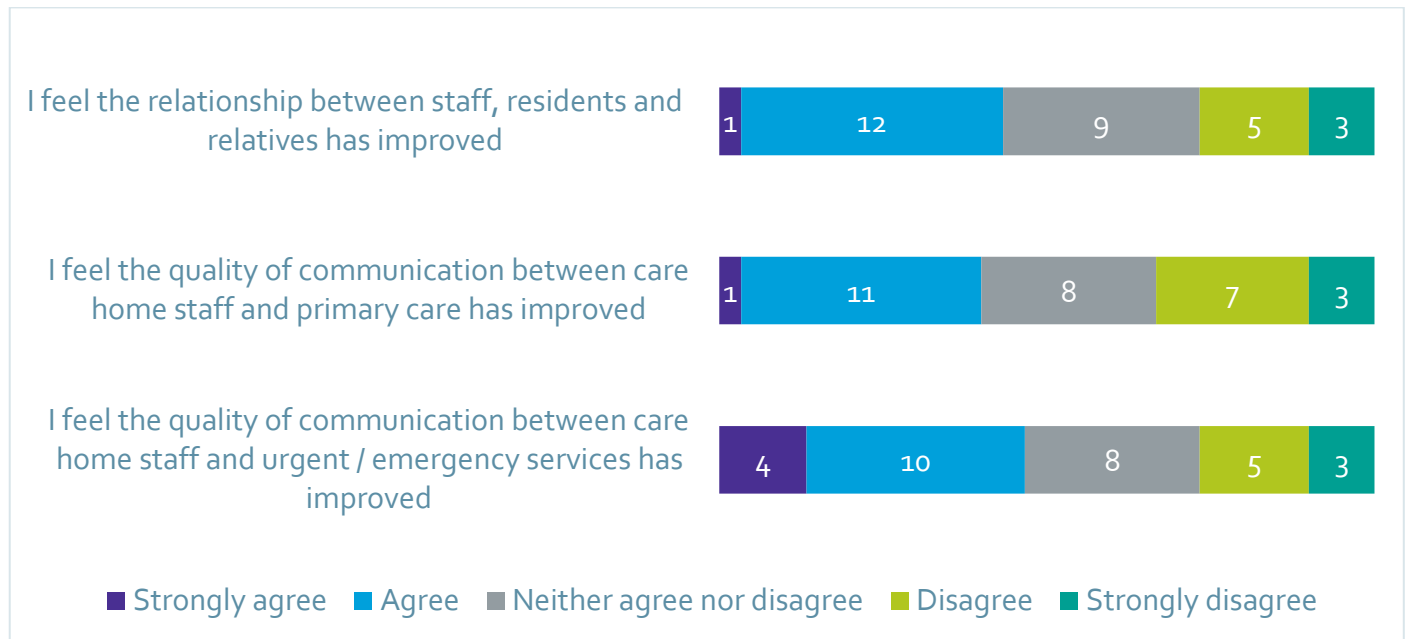
3.1.4. Did care home staff feel confident using the technology?

On the whole, care home staff that responded to the survey felt confident using remote monitoring solutions in their care setting with residents, with 24 respondents agreeing that they were confident, four neither agreed nor disagreed and two respondents strongly disagreed.

Figure 5: Staff perception: confidence of staff using remote monitoring

11	13	4	2

■ Strongly agree ■ Agree ■ Neither agree nor disagree ■ Disagree ■ Strongly disagree
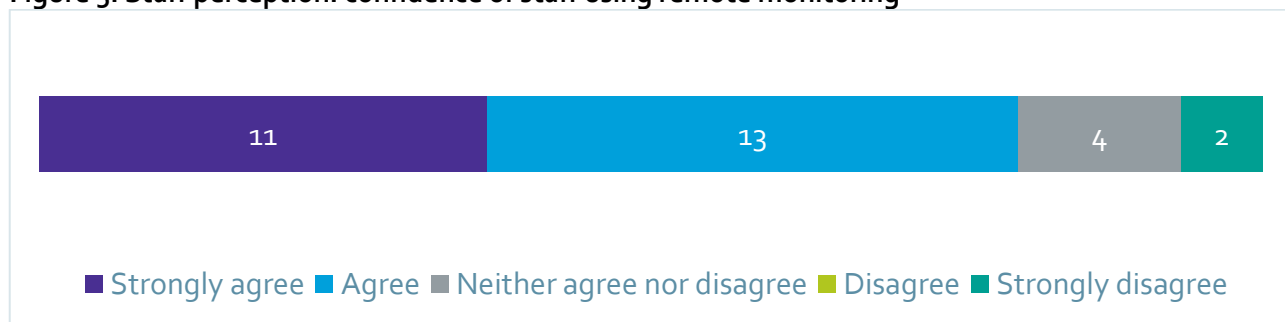
Almost all (29) respondents received training when the remote monitoring solution was introduced into their care setting; one respondent commented s/he did not work at the care setting at the time the remote monitoring solution was introduced.

Of the 29 care home staff that received training when the remote monitoring solution was introduced, 13 found the training to be extremely useful, eight felt it was very useful, five found it moderately useful, one slightly useful and two respondents felt it was not at all useful. Thirteen respondents further commented when asked to share their thoughts or suggestions on the training they received. It was reported that the training was informative and thorough, and the trainer was very professional. Two respondents mentioned that they would have preferred face to face training instead of online.

Figure 6: Staff perception: How useful was training on remote monitoring?

| 13 | 8 | 5 | 1 | 2 |

■ Extremely useful ■ Very useful ■ Moderately useful ■ Slightly useful ■ Not at all useful
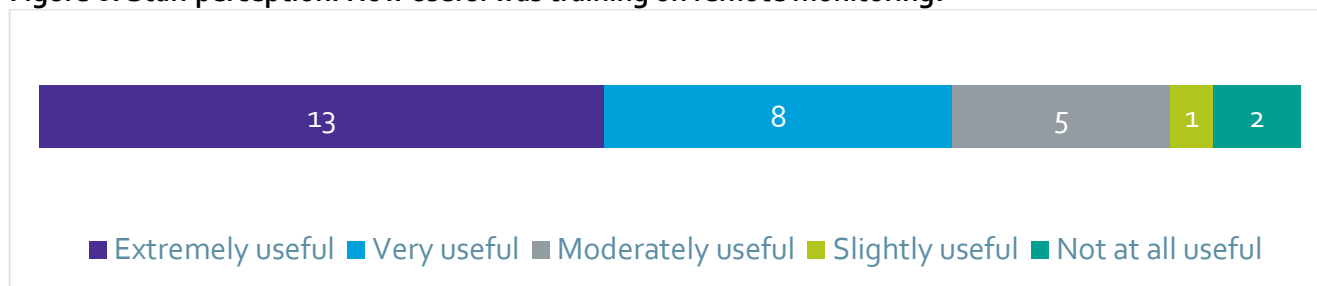
3.1.5. Did the use of remote monitoring technology impact healthcare utilisation?

A total of 20 care homes in North Central London whose remote monitoring systems were operationally live prior to April 2021 were matched to data from the London Ambulance Service regarding rates of incidents and conveyances for each care home. Ambulance activity for the period April - December 2021 for these 20 care homes was compared with ambulance activity April - December 2021 to see if activity had reduced during the period where remote monitoring was introduced compared to a 'pre' remote monitoring period.

As there is likely to be huge variation year on year in terms of healthcare utilisation due a range of factors such as weather conditions, the Covid-19 pandemic and other health factors, a 'control' group of 100 care homes in North Central London that did not implement remote monitoring technology was included in this analysis. The intention was to compare any changes in rates between April – December 2019 and April – December 2021 between the two groups, i.e. to test whether there was a difference between the rates of reduction or increase in the remote monitoring care homes when compared to the control group which might indicate that any rate of change may be due to the use of remote monitoring.

Please note that although the data was compared to a 'control' group, it is difficult to wholly attribute any changes to remote monitoring, especially as the post pilot implementation data was collected during the pandemic which may have skewed healthcare utilisation data.

Table 3 shows that when comparing activity for April – December 2019 and April – December 2021 for the 20 remote monitoring care homes, there was a **reduction** in ambulance activity with a **-5%** reduction in incidents, a **-12%** reduction in conveyances to hospital, a **-1%** reduction in blue calls (defined by LAS as the most urgent calls, where the hospital is pre-alerted that the patient is on their way) and a **-11%** reduction in out of hours incidents.

When comparing to the group of 100 non-remote monitoring care homes, reductions were also seen across the same period in all measures except for incidents. The rates of reduction were a bit higher amongst **remote monitoring care homes** for incidents (-5% compared to 0% reduction for non-remote monitoring), conveyances to hospital (-12% compared to -7% for non-remote monitoring) and out of hours incidents (-11% compared to -7% for non-remote monitoring care homes). There was however a bigger reduction in blue calls for those homes that had **not** implemented remote monitoring, where these homes showed a 9% reduction in calls and the homes with remote monitoring showed a 1% reduction in blue calls.

Table 3: London Ambulance Service Activity for North Central London care homes

		Incidents	Conveyances	Blue calls	Out of Hours
Care homes that implemented remote monitoring (n=20)	pre pilot (Apr-Dec 2019)	784	668	186	387
	post pilot (Apr-Dec 2021)	741	586	184	344
	Diff	-43	-82	-2	-43
	% diff	-5%	-12%	-1%	-11%
Care homes that did not implement remote monitoring (n=100)	Pre pilot (Apr-Dec 2019)	2225	1736	405	1254
	Post pilot (Apr-Dec 2021)	2220	1620	368	1165
	Diff	-5	-116	-37	-89
	% diff	0%	-7%	-9%	-7%

Data on emergency hospital care was obtained from North Central London ICS to help understand if remote monitoring in care homes had impacted the need for emergency healthcare services. It was possible to match 19 care homes in North Central London that had implemented remote monitoring prior to April 2021 to the hospital care home dataset which included data on A&E attendances, non-elective admissions and readmissions, as well as data on length of hospital stay i.e. the number of care home residents that were admitted to hospital for 7+ days and 21+ days.

In order to compare the rates of **A&E attendances** and **non-elective admissions** to general trends at the time, a group of 71 care homes that did not implement remote monitoring in North Central London were selected as a comparator.

Comparison of the rates of emergency hospital activity from April - December 2021 when remote monitoring had been implemented in these 19 care homes to the same time period - April - December 2019 (prior to the implementation of remote monitoring) - shows **large increases** in activity in 2021, with A&E attendances more than doubling (an increase of 108%), non-elective admissions increasing by 74% and readmissions increasing by 63%.

When comparing to changes between the same two time periods for those care homes that had **not** implemented remote monitoring, increases were also seen. These **increases** were **slightly higher** for care homes that had **not** implemented remote monitoring than those that had. Amongst care homes **without** remote monitoring there was a 115% increase in A&E attendances (compared to 108% increase for homes that implemented remote monitoring), a 92% increase in non-elective admissions (compared to 74% increase for homes that implemented remote monitoring) and a 66% increase in readmissions (compared to a 63% increase for homes with remote monitoring).

See also separate work undertaken by NCL (referenced in the conclusion section) that also compares change in LAS usage for homes with and without remote monitoring.

Table 4: Emergency hospital activity for North Central London care homes

		A&E attendances	Non- elective admissions	Readmissions
Care homes that implemented remote monitoring (n=19)	pre pilot (Apr-Dec 2019)	307	210	41
	post pilot (Apr-Dec 2021)	639	365	67
	Diff	332	155	26
	% diff	108%	74%	63%
Care homes that did not implement remote monitoring (n=71)	Pre pilot (Apr-Dec 2019)	755	466	88
	Post pilot (Apr-Dec 2021)	1621	895	146
	Diff	866	429	58
	% diff	115%	92%	66%

In terms of **length of stay** in hospital for non-elective admissions, **increases** in the number and proportion of admissions exceeding seven days were seen **after implementing remote monitoring**. **Prior** to the implementation of remote monitoring, 38% of non-elective admissions were of 7+ days duration, compared to 49% percent of non-elective admissions in April to December 2021 (**after** implementation of remote monitoring). This increase of 7+ day admissions equate to a 123% increase from 80 admissions in the pre remote monitoring period compared to 178 post implementation.

Increases were also seen for longer stays (three or more weeks duration) with a 96% increase between the pre-remote monitoring period and post-remote monitoring, and an increase in the proportion of non-elective admissions that stayed for three or more weeks up from 11% to 13%.

When comparing the same time periods to the group of 71 care homes that had **not** implemented remote monitoring, slightly lower proportions of 7+ day admissions were observed (46% compared to 49% for those that implemented remote monitoring); and, for 21+ day admissions (11% compared to 13% of homes that had implemented remote monitoring). However, these differences were also seen in the pre remote monitoring period which suggests that the lower proportion of longer length of stay (7+ and 21+ days) in non-remote monitoring homes may be due to the composition of the care homes sampled and not linked to the implementation of remote monitoring.

Comparison of the differences in the number of residents admitted for 7+ days between the pre and post remote monitoring periods shows a greater increase in stays of 7+ days amongst those homes **without** remote monitoring (143% increase) compared to those homes **with** remote monitoring (123% increase). This pattern was also seen for stays of 21+ days, where a 115% increase amongst homes without remote monitoring was observed, compared to a 96% increase in those homes that had implemented remote monitoring.

Table 5: Length of Stay of care home resident non elective admissions – North Central London

| | 7+ days | | 21+ days | |
	Remote monitoring (19)	No remote monitoring (71)	Remote monitoring (19)	No remote monitoring (71)
pre pilot (Apr-Dec 2019)	80 (38%)	168 (36%)	24 (11%)	47 (10%)
post pilot (Apr-Dec 2021)	178 (49%)	408 (46%)	47 (13%)	101 (11%)
Diff	98	240	23	54
% diff	123%	143%	96%	115%

3.1.6 Summary

North Central London ICS implemented Whzan technology, with the support of nurse educators and a clinical lead. Sixty-eight care homes were operationally live (defined as care homes that were using Whzan to conduct resident readings at least once a month on average between the month of their first resident reading and December 2021).

A majority of care home staff felt that remote monitoring solutions in care settings had benefitted staff, residents and the wider healthcare system. However, there were mixed views on whether remote monitoring improved the quality of communication between care home staff, primary care and emergency services.

We compared healthcare utilisation activity from April – December 2019 and April – December 2021 for homes that implemented remote monitoring with homes that did not. For remote monitoring care homes, there was a slightly **greater** reduction in incidents (-5% compared to 0% reduction for non-remote monitoring), conveyances to hospital (-12% compared to -7% for non-remote monitoring) and out of hours incidents (-11% compared to -7% for non-remote monitoring care homes). There was however a bigger reduction in blue calls for those homes that had **not** implemented remote monitoring.

We compared changes in emergency hospital activity data from April – December 2019 to April – December 2021 for homes that had implemented remote monitoring with homes that had not implemented remote monitoring. There was a slightly higher increase in A&E attendances, non-elective admissions and readmissions for homes that did not implement remote monitoring.

Changes in admissions and length of stay data over the same two time periods was compared between the same two sets of homes. Homes that had not implemented remote monitoring showed a greater increase in stays of 7+ days and in stays of 21+ days than homes that had implemented remote monitoring.

3.2 North East London

3.2.1 Overview of model

Table 6: Overview of North East London ICS model

Aim	North East London (NEL) aimed to expand the existing Feebris[4] remote monitoring solution to 30 care homes and introduce Inhealthcare[5] into the remaining (over 200) care homes.
Product and Use	Care homes were asked to use the technology at a frequency set by the GP supporting their care home, or when residents were unwell. GPs were able to access the results via EMIS if the care home had implemented Inhealthcare, or via an app if the care home had implemented Feebris. With both Feebris and Inhealthcare, the information was digitally accessible to GPs, but in practice care homes would still contact the GP to bring the results to their attention.
Staffing Model	Initially, the plan was to hire nurse educators and digital champions to support implementation. However, nurse educators could not be hired due to recruitment challenges. Two digital champions were onboarded however they were met with hesitance from some care homes as they themselves were managers/owners of other care homes. Eventually, Digital Support Officers (DSOs) - NHS administrative staff working at band 6 level - were hired to support implementation.
Additional support provided	<u>Feebris</u> delivered training directly to care home staff and GPs; the ICS project team was not involved in delivering training. <u>Inhealthcare</u> developed a training platform, as well as training videos and a step-by-step user guide. The project team (DSOs + 2 ICS leads) worked with suppliers to deliver the training to care home staff and GPs. Group training and train the trainer training sessions were put in place. The ICS Clinical Lead also worked with Inhealthcare to develop a bespoke clinical pathway to incorporate remote monitoring.

3.2.2 Was the technology used when implemented?

In North East London, Inhealthcare and Feebris remote technology was rolled out. Usage data for Inhealthcare was not available to the evaluation team during the data collection period, therefore the findings described below relate only to the Feebris technology.

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[4] Feebris - Transform Community Care
[5] Inhealthcare | Virtual wards and remote patient monitoring technology

Twenty-eight care homes trialled Feebris between May 2020 and December 2021; of these, 23 care homes were operationally live (defined as care homes that were using Feebris to conduct check-ups (observations) at least once a month on average between the month of their first care home resident check-up and December 2021).

Eight care homes were operationally live in May 2020; this steadily increased up to 23 care homes that were live by September 2021, as shown by the vertical bards in Figure 7.

3,605 check-ups were conducted across all 23 care homes throughout May 2020 – December 2021. The number of checks-ups conducted did not follow the same steady increase as the increase in homes becoming operationally live – fluctuations were seen in the numbers of check-ups conducted across all operationally live care homes throughout this time period.

Figure 7: No of operationally live care homes by no of check-ups – monthly time trend
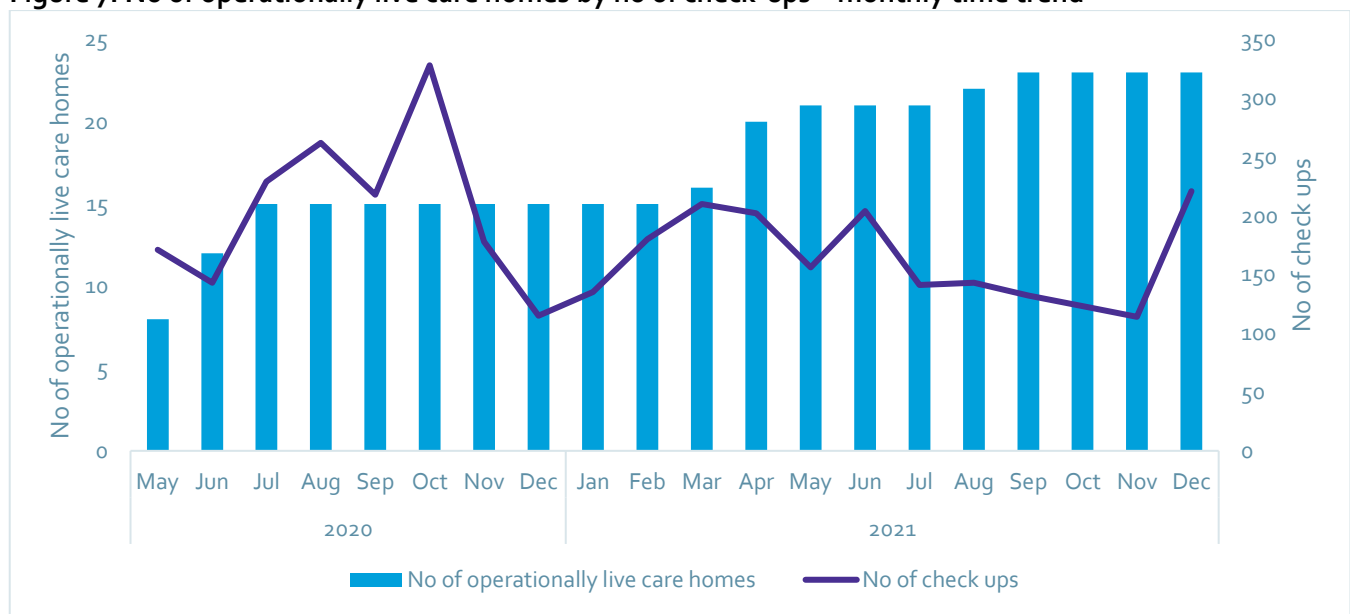
On average (median), care homes conducted two check-ups per care home per month, with quite a large variance between care homes and months, giving an interquartile range of 17.

The number of check-ups carried out per care home each month varied month on month and over time. The numbers of care homes doing no check-ups per month increased towards the end of the pilot. Those doing 10 or more check-ups per month varied greatly month on month.

Figure 8: No of care homes by no of residents with check-ups carried out per care home per month – time trend
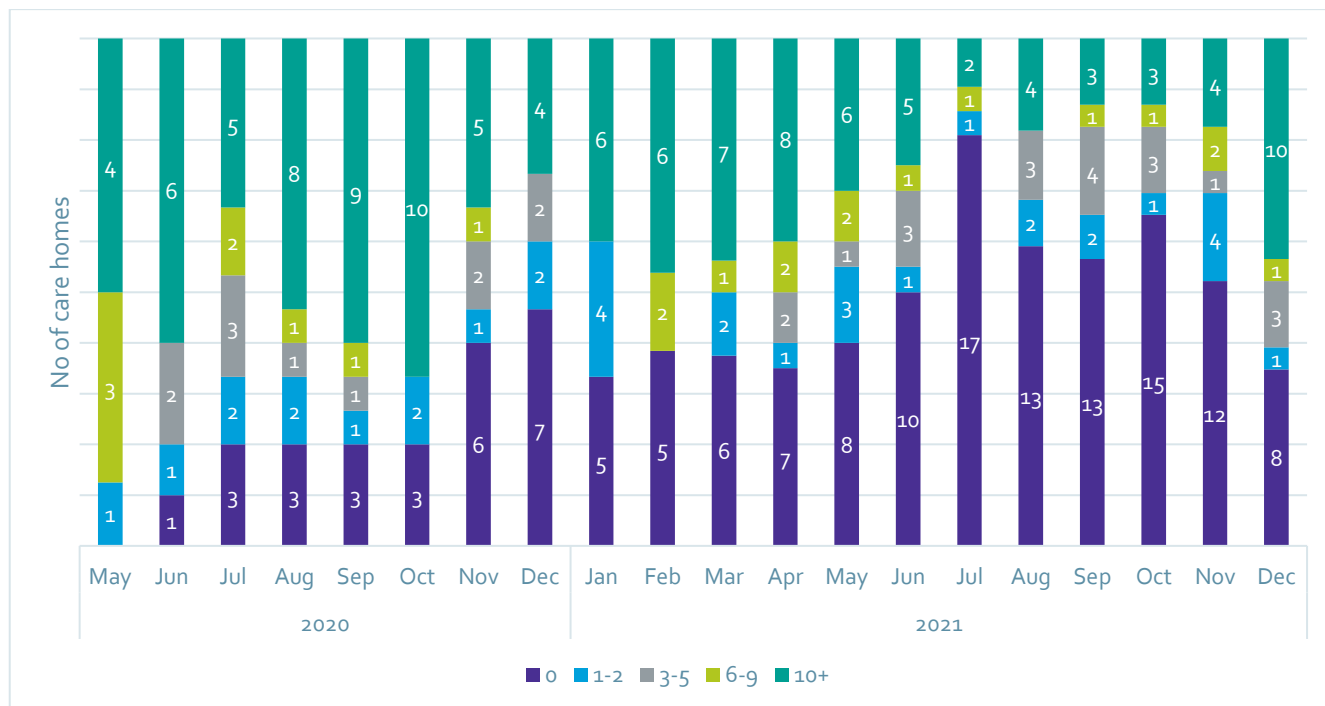
3.2.3   Did care home staff perceive benefits?

A survey was sent out on 3 February 2022 to staff working in care homes that had implemented remote monitoring in North East London. Seven staff members responded and gave their views. Of these, four were registered managers, two were carers and one worked in an administrative role. All respondents had used remote monitoring solutions in their care setting.

In terms of the benefits of remote monitoring, five respondents agreed that remote monitoring in a care setting benefits staff, six agreed that it benefits residents and five agreed that it benefits the wider healthcare system.

Conversely two respondents strongly disagreed that remote monitoring in care settings benefits staff and one respondent strongly disagreed that it benefits residents.

Figure 9: Staff perception: has remote monitoring brought benefits?

Statement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Remote monitoring in care setting has benefitted staff	1	4			2
Remote monitoring in care setting has benefitted residents	1	5			1
Remote monitoring in care setting has benefitted the wider healthcare system	1	4	2		

■ Strongly agree ■ Agree ■ Neither agree nor disagree ■ Disagree ■ Strongly disagree
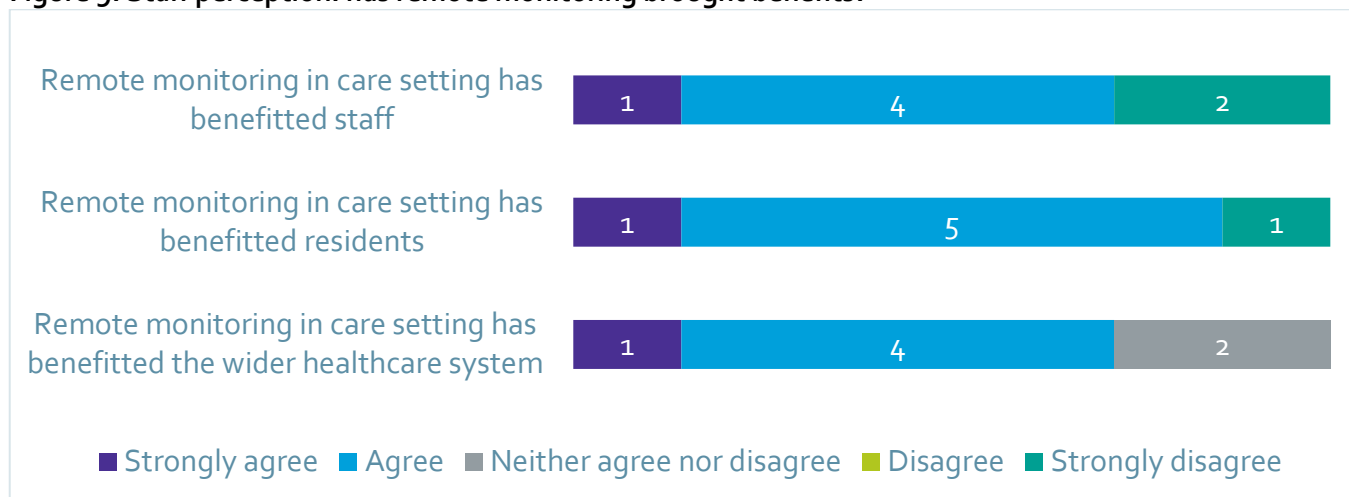
Respondents were asked if they felt the remote monitoring solution adopted in their care setting had changed the way they care for residents.

There were mixed views. Four respondents felt it had, whilst three respondents felt it had not. Four respondents further commented when asked to share any thoughts related to their answers. It was reported that remote monitoring helped to keep track of residents' health changes, could reduce the number of calls to ambulance services and could prevent certain types of emergency admissions to hospitals as GPs were actively involved in their care.

In terms of any improvements in communications, five respondents agreed that remote monitoring had improved relationships between staff, residents, and relatives, with one respondent disagreeing and one respondent neither agreeing nor disagreeing. Three respondents agreed that communication between care home staff and primary care had improved, with four respondents neither agreeing nor disagreeing. Four respondents agreed that the quality of communication between care home staff and urgent/ emergency care had improved, with three respondents neither agreeing nor disagreeing.

Figure 10: Staff perception: impact of Remote Monitoring on relationships and communication

Statement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel the relationship between staff, residents and relatives has improved	2	3	1	1	
I feel the quality of communication between care home staff and primary care has improved	1	2	4		
I feel the quality of communication between care home staff and urgent / emergency services has improved	1	3	3		

■ Strongly agree ■ Agree ■ Neither agree nor disagree ■ Disagree ■ Strongly disagree

3.2.4　Did care home staff feel confident using the technology?

The survey asked care home staff to rate their agreement with a statement around their confidence using remote monitoring solutions. Five respondents agreed that they were confident with the technology, with two respondents neither agreeing nor disagreeing.

Figure 11: Staff perception: confidence of staff using Remote Monitoring
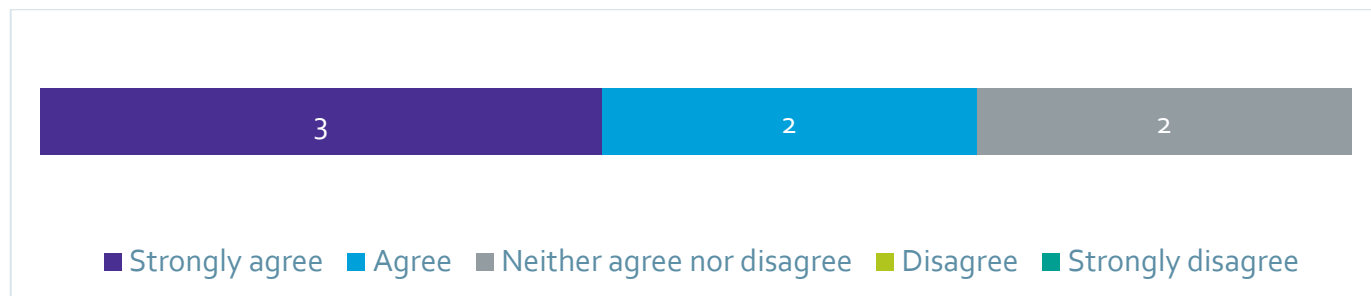
Survey respondents were asked whether they received training when the remote monitoring solution was introduced into their care setting. Five respondents said they had received training and two respondents could not remember whether they had received training or not.

Of the five care home staff who received training, two found the training to be extremely useful, a further two felt it was very useful, and one respondent rated the training as being moderately useful.

Figure 12: Staff perception: How useful was training on remote monitoring?
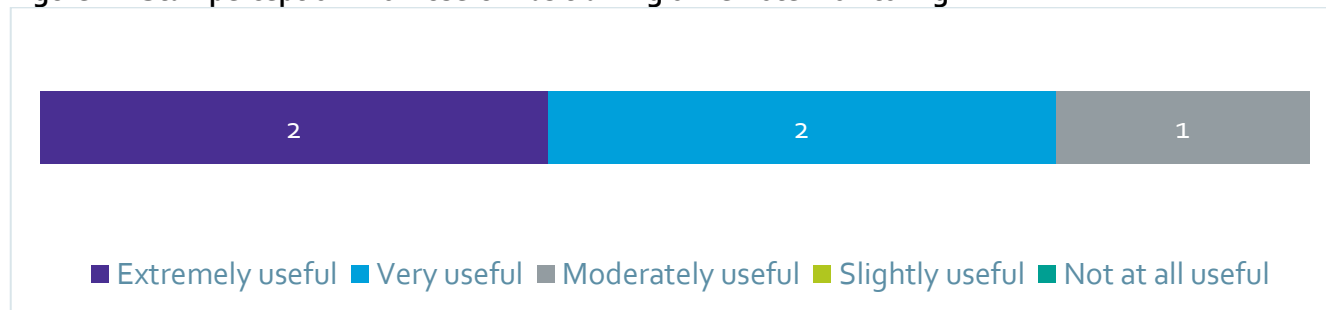
3.2.5　Did the use of remote monitoring technology impact healthcare utilisation?

A total of 16 care homes in North East London whose remote monitoring systems were operationally live prior to April 2021 were matched to data from the London Ambulance Service regarding rates of incidents and conveyances for each care home. The ambulance activity for a range of metrics was then measured for the period of April to December 2021 for these 16 care homes. In order to understand whether there had been significant changes to these activity measures, the same time period (April to December) in 2019 was also used as a comparison to see if rates of ambulance activity had reduced during the period where remote monitoring was introduced compared to a 'pre' remote monitoring period.

As there is likely to be huge variation year on year in terms of healthcare utilisation due to a range of factors such as weather conditions, the Covid-19 pandemic and other health factors, a 'control' group of 132 care homes in North East London that did not implement remote monitoring technology was included in this analysis. The intention was to compare any changes in rates between April – December 2019 and April –

December 2021 between the two groups, i.e., to test whether there was a difference between the rate of increase or reduction in the remote monitoring care homes when compared to the care homes without remote monitoring which might indicate that any change may be due to the use of remote monitoring. Please note that although the data was compared to a 'control' group, it is difficult to wholly attribute any changes to remote monitoring, especially as the post pilot implementation data was collected through the pandemic which may have skewed healthcare utilisation data.

Table 7 shows that when comparing activity for April – December 2019 and April – December 2021 for the 16 remote monitoring care homes, there was a **reduction** in ambulance activity with a **-1%** reduction in incidents, a **-9%** reduction in conveyances to hospital, a **-8%** reduction in blue calls and a **-4%** reduction in out of hours incidents.

When comparing to the reductions seen in the 136 non-remote monitoring care homes, reductions were also seen for **non-remote monitoring** care homes in all measures. The rates of reduction were higher for care homes that had **not** implemented remote monitoring for all measures, with a -6% reduction in incidents (compared to –1% for remote monitoring care homes), a -21% reduction for conveyances (compared to -9% for remote monitoring care homes), a -13% reduction for blue calls (compared to -9% for remote monitoring care homes) and a -9% reduction for out of hours incidents (compared to -4% for remote monitoring care homes.

Table 7: London Ambulance Service Activity for NEL care homes

		Incidents	Conveyances	Blue calls	Out of Hours
Care homes that implemented remote monitoring (n=16)	**pre pilot (Apr-Dec 2019)**	505	432	109	256
	post pilot (Apr-Dec 2021)	499	394	100	247
	Diff	-6	-38	-9	-9
	% diff	-1%	-9%	-8%	-4%
Care homes that did not implement remote monitoring (n=132)	**Pre pilot (Apr-Dec 2019)**	3098	2611	698	1604
	Post pilot (Apr-Dec 2021)	2907	2058	604	1456
	Diff	-191	-553	-94	-148
	% diff	-6%	-21%	-13%	-9%

Data on emergency hospital care was obtained from North East London ICS to help understand if remote monitoring in care homes had impacted the need for emergency healthcare services. It was possible to match 15 care homes in North East London that had implemented remote monitoring prior to April 2021 to the hospital care home dataset which included data on A&E attendances and non-elective admissions, as well as data on hospital length of stay for care home residents who had a non-elective admission.

In order to compare the rates of **A&E attendances** and **non-elective admissions** to general trends at the time a group of 157 North East London care homes that did not implement remote monitoring were selected as a

comparator.

When comparing the rates of emergency hospital activity between April and December 2021 when remote monitoring had been implemented in these 15 care homes to the same time period (April to December) in 2019, the number of A&E attendances had remained fairly stable with four more attendances post remote monitoring than pre (an increase of 0.9%). There had however been a 42% increase in non-elective admissions between the two time periods.

When comparing to changes between the same two time periods for those care homes that had **not** implemented remote monitoring there was a slightly bigger increase in A&E attendances for care homes that had **not** implemented remote monitoring (2%) compared to homes that had remote monitoring (0.9%), however there was a smaller increase in non-elective admissions for homes without remote monitoring (13%) compared to those who had implemented remote monitoring solutions (42%).

Table 8: Emergency hospital activity for North East London care homes

	A&E attendances		Non- elective admissions	
	Remote monitoring (15)	No remote monitoring (157)	Remote monitoring (15)	No remote monitoring (157)
pre pilot (Apr-Dec 2019)	443	3183	217	1793
post pilot (Apr-Dec 2021)	447	3256	308	2032
Diff	4	73	91	239
% diff	0.9%	2%	42%	13%

In terms of **length of stay** in hospital for non-elective admissions there was a reduction in the proportion of non-elective admissions that had stays of up to seven days amongst care homes that **implemented remote monitoring** with 62% of admissions being up to seven days prior to implementation compared to 57% for the post implementation period (April to December 2021). Conversely, longer stays of eight to 21 days slightly increased from 27% of admissions up to 31% of admissions. Long stays of 22 or more days remained relatively stable at 12% of non-elective admissions (compared to 11% for the pre remote monitoring period).

When comparing the changes between pre and post remote monitoring length of stays to the group of care homes that did **not** implement a remote monitoring solution, there were much bigger increases in admissions for all length of stays amongst the remote monitoring care homes compared to those with **no** remote monitoring, with a 18% increase in stays of up to seven days (compared to a stable picture of 0% change for homes without remote monitoring), a 50% increase in stays of between eight and 21 days (compared to an 8% increase for homes without remote monitoring) and a 48% increase in stays of 22 or more days (compared to a -9% reduction in care homes without a remote monitoring solution).

Table 9: Length of stay of care home resident non elective admissions – North East London

	0-7 days		8-21 days		22+ days	
	Remote monitoring (15)	No remote monitoring (157)	Remote monitoring (15)	No remote monitoring (157)	Remote monitoring (15)	No remote monitoring (157)
pre pilot (Apr-Dec 2019)	134 (62%)	1060 (61%)	58 (27%)	476 (27%)	23 (11%)	215 (12%)
post pilot (Apr-Dec 2021)	158 (57%)	1056 (60%)	87 (31%)	512 (29%)	34 (12%)	195 (11%)
Diff	24	-4	29	36	11	-20
% diff	18%	0%	50%	8%	48%	-9%

3.2.6 Summary

North East London implemented Feebris technology with the support of Digital Support Officers (DSOs). Twenty-three care homes were operationally live (defined as care homes that were using Feebris to conduct check-ups at least once a month on average between the month of their first care home resident check-up and December 2021).

Five out of seven respondents agreed that remote monitoring benefited staff, six agreed that it benefited residents and five agreed that it benefited the wider healthcare system. Five respondents agreed that remote monitoring had improved relationships between staff, residents, and relatives. However, views were mixed about the impact on communication between care home staff and primary care and urgent/ emergency care.

We compared healthcare utilisation activity from April – December 2019 and April – December 2021 for homes that implemented remote monitoring with homes that did not. For non-remote monitoring care homes, there was a slightly greater reduction in incidents (-6% compared to -1% reduction for remote monitoring), conveyances to hospital (-21% compared to -9% for remote monitoring), out of hours incidents (-9% compared to -4% for remote monitoring) and blue calls (-13% compared to -9% for remote monitoring care homes).

Changes in emergency hospital activity data from April – December 2019 to April – December 2021 for homes that had implemented remote monitoring were compared to changes in data for the same period for homes that had not implemented remote monitoring.

For homes **without** remote monitoring, there was a slightly **higher** increase in A&E attendances but a slightly **smaller** increase non-elective admissions.

Changes in admissions and length of stay data over the same two time periods was compared between the same two sets of homes.

Much larger increases in admissions were observed for all length of stays amongst the remote monitoring care homes compared to those with **no** remote monitoring.

3.3 South East London

3.3.1 Overview of model

Table 10: Overview of South East London ICS model

Aim	South East London (SEL) ICS had already begun to implement Docobo[6] technology before this project commenced. Their aim was to further expand use of the technology. Another product– ARC – was also initiated, but a strategic decision was made by the SEL ICS programme to withdraw it. This evaluation does not therefore look at implementation of ARC in south east London but focuses just on Docobo.
Product and usage	Care homes were provided with Tablet devices which staff would use to gather information about the resident and transmit this to the GP. The following three 'use cases' were agreed for the technology, with corresponding question sets developed by the GP and care home to fit each scenario. Carers were guided to record soft signs and vital signs, based on the question set: 1.Deteriorating resident – resident is unwell. Carer needs advice from GP within two hours. The carer (and resident in some cases) completes a question set which is transmitted to GP via secure messaging into their EMIS system. The GP is able to review the data and respond with the recommended course of action. 2.Ward round request – to gather information about a particular concern that had been raised; the resident's name would then be added to the list for a routine weekly face-to-face visit. 3.Routine monthly wellbeing (Resident of the Day) – to gather data on residents each month to build up a picture of what is normal for each person. If any of the readings exceed normal parameters, this would be highlighted to the GP. GPs would monitor observations when an alert occurred and have the option to log in to doc@Home to look at residents' monthly baseline to support clinical triage. Carers would submit vital signs via the Tablet including soft signs for a deteriorating resident, Resident of the Day (monthly wellbeing check) and in some care homes ward round request. Data was transferred from Docobo into the EMIS system. The GP practice reception would receive an email alert to their preferred email inbox and the PDF clinical assessment would be integrated directly into the patient's EMIS record. Standard Operating Procedures agreed meant that the GP would aim to respond to care home requests within a two-hour timeframe. Response would be via email or telephone. Clinical observations include weight, blood pressure, pulse rate and oxygen saturation. One home also piloted screening Electrocardiograms (ECGs).
Staffing model	Training was delivered by the Docobo service manager at regular intervals (in person initially and supported with further virtual training upon care homes request). All care staff and clinical/nursing staff were trained at participating care homes. Group training, one-to-one support sessions and webinars were used.

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[6] Remote Patient Monitoring | The Latest Healthcare Technology | Docobo

	GPs and their administrative staff were trained to ensure the workflow was clear and that alerts could be processed and actioned. Following agreement to implement Docobo, the solution could be rolled out within two weeks, dependent on availability for training.
Additional support provided	Champions/super users were identified to receive training to allow them to support with training new staff. Training delivery was also supported by a member of the Project Team who supported homes who needed refresher or troubleshooting support.

3.3.2 Was the technology used when implemented?

In south east London, 11 care homes trialled Docobo between June 2020 and December 2021. Of these, 10 care homes were operationally live (defined as care homes that were using Docobo to conduct assessments at least once a month on average between the month of their first care home resident assessment and December 2021). One care home had been using Docobo since October 2018, and the other care homes implemented remote monitoring between June and December 2020.

A total of 4,991 assessments (observations) were conducted across all 10 care homes throughout June 2020 – December 2021. The number of assessments conducted remained fairly stable across the pilot period. This probably reflects the model deployed in south east London, where a high proportion of assessments (72%) were carried out as part of a 'monthly baseline' compared to lower proportions (26%) due to concerns regarding resident deterioration.

Figure 13: No of operationally live care homes by no of assessments – monthly time trend
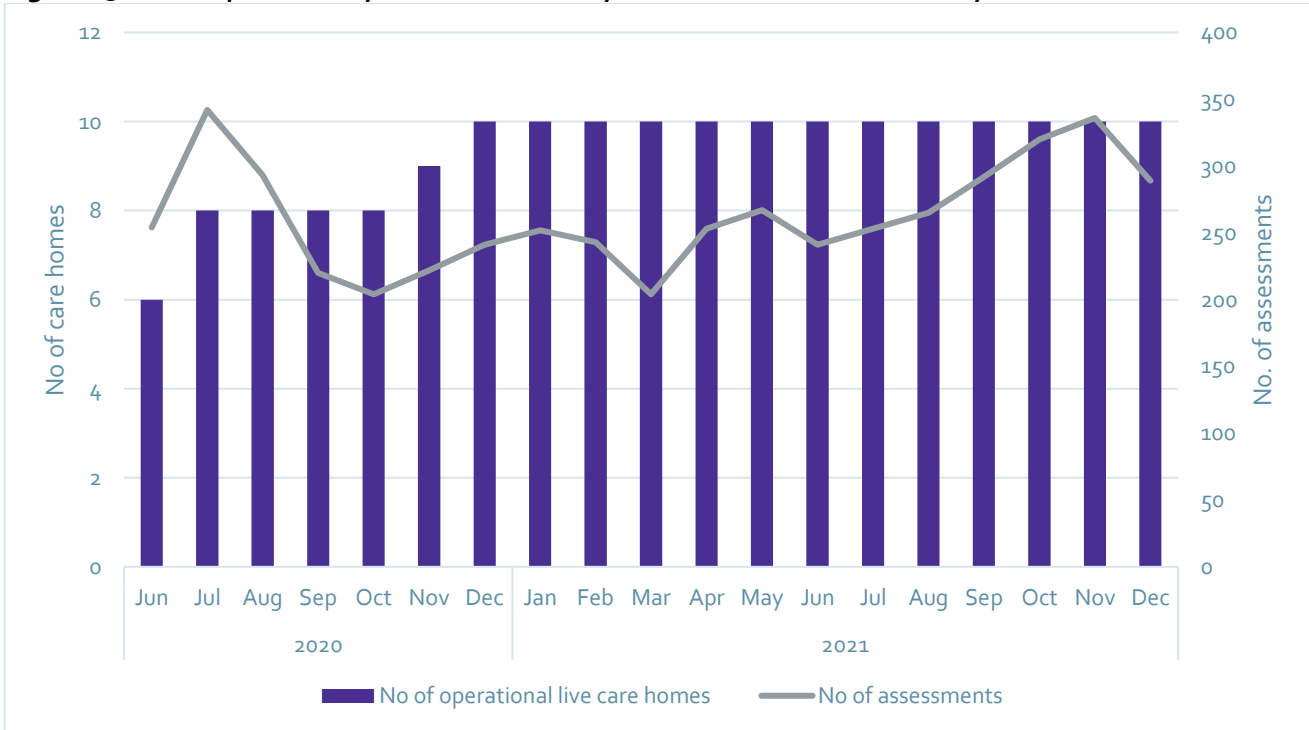
On average (median) care homes conducted 22 assessments per care home per month, with quite a large variance between care homes and months, giving an interquartile range of 43.

The number of assessments done per care home each month varied month on month with no clear pattern in utilisation. It is clear from the data that all ten care homes that have implemented remote monitoring were still using the kits in December 2022.

Figure 14: No of care homes by no of residents with assessments carried out per care home per month – time trend
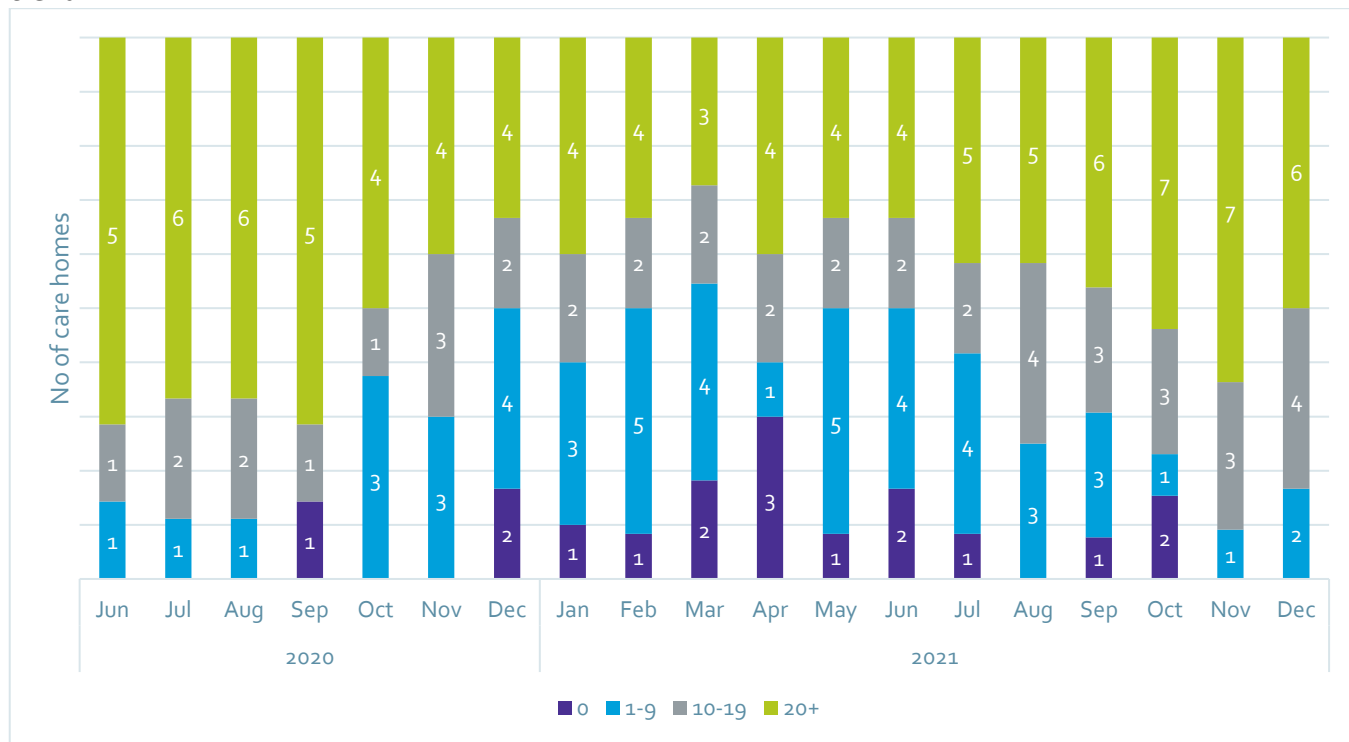
3.3.3 Did care home staff perceive benefits?

A survey was sent out on 3 February 2022 to care home staff working in each of the care homes that implemented a remote monitoring solution in south east London to gain their views. Note that whilst the survey was sent to homes in Bexley (who had implemented the Docobo product), and homes in Bromley (who began to implement technology provided by ARC which was subsequently withdrawn), the below analysis is just based on the views of care home staff working in care homes in Bexley that had deployed the Docobo solution.

The analysis below is of the views of care home staff post implementation of the remote monitoring solution. A total of 19 members of staff responded to the survey, including nine carers, three registered managers, four nurses and two deputy managers. All survey responders had used the remote monitoring solution available in their care home.

Most survey respondents felt that remote monitoring solutions in care settings had benefitted staff (16), residents (16) and the wider healthcare system (15), with three survey respondents disagreeing there had been benefits to staff, three disagreeing that there had been benefits to residents and three disagreeing that there had been benefits to the wider healthcare system.

Figure 15: Staff perception: has remote monitoring brought benefits?
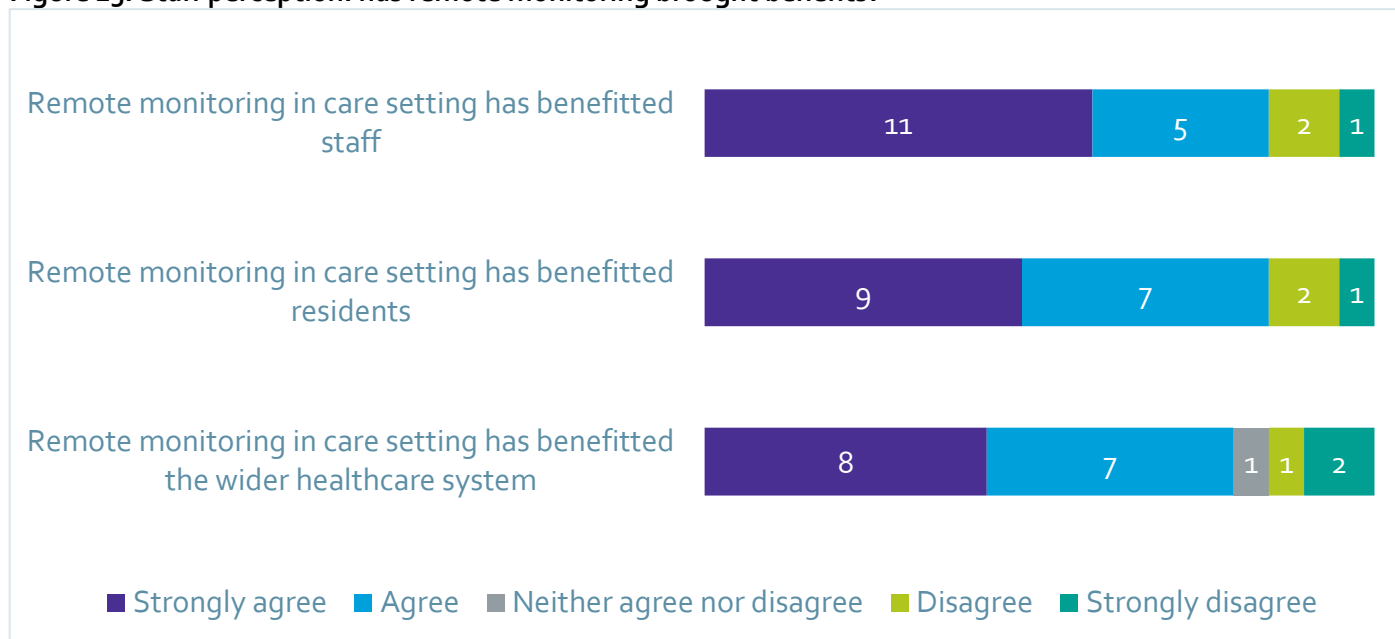
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Remote monitoring in care setting has benefitted staff	11	5		2	1
Remote monitoring in care setting has benefitted residents	9	7		2	1
Remote monitoring in care setting has benefitted the wider healthcare system	8	7	1	1	2

Respondents were asked if they felt the remote monitoring solution adopted in their current care setting had changed the way they care for residents, with the majority (16) feeling it had, whilst three respondents felt it had not.

Some survey respondents further commented when asked to share any thoughts related to their answer. It was reported that remote monitoring made it easier for staff to monitor and track changes/trends in residents' health. Remote monitoring also improved communication with their GPs as they received quicker advice and made referrals more efficiently.

"[Remote monitoring] allowed us, as seniors, to obtain advice much quicker, complete referrals to GP more efficiently, given us a space to complete observations and record these correctly."
Senior Carer

On the contrary, a few respondents raised concerns that GPs and other healthcare professionals were not taking actions quickly enough and a few raised concerns that when a GP visit was required, it did not take place.
Views regarding the impact of remote monitoring on communication were generally positive, with 13 respondents feeling that the relationship between staff, residents and relatives had improved as a result of remote monitoring technology, compared to two respondents who disagreed and felt it hadn't improved.

Similarly, 15 respondents agreed that the quality of communication between care home staff and primary care had improved; two respondents disagreed. Thirteen respondents agreed that the quality of communications between care home staff and urgent and emergency services had improved; one respondent disagreed.

Figure 16: Staff perception: impact of remote monitoring on relationships and communication

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel the relationship between staff, residents and relatives has improved	5	8	4	1	1
I feel the quality of communication between care home staff and primary care has improved	5	10	2		2
I feel the quality of communication between care home staff and urgent / emergency services has improved	3	10	5	1	
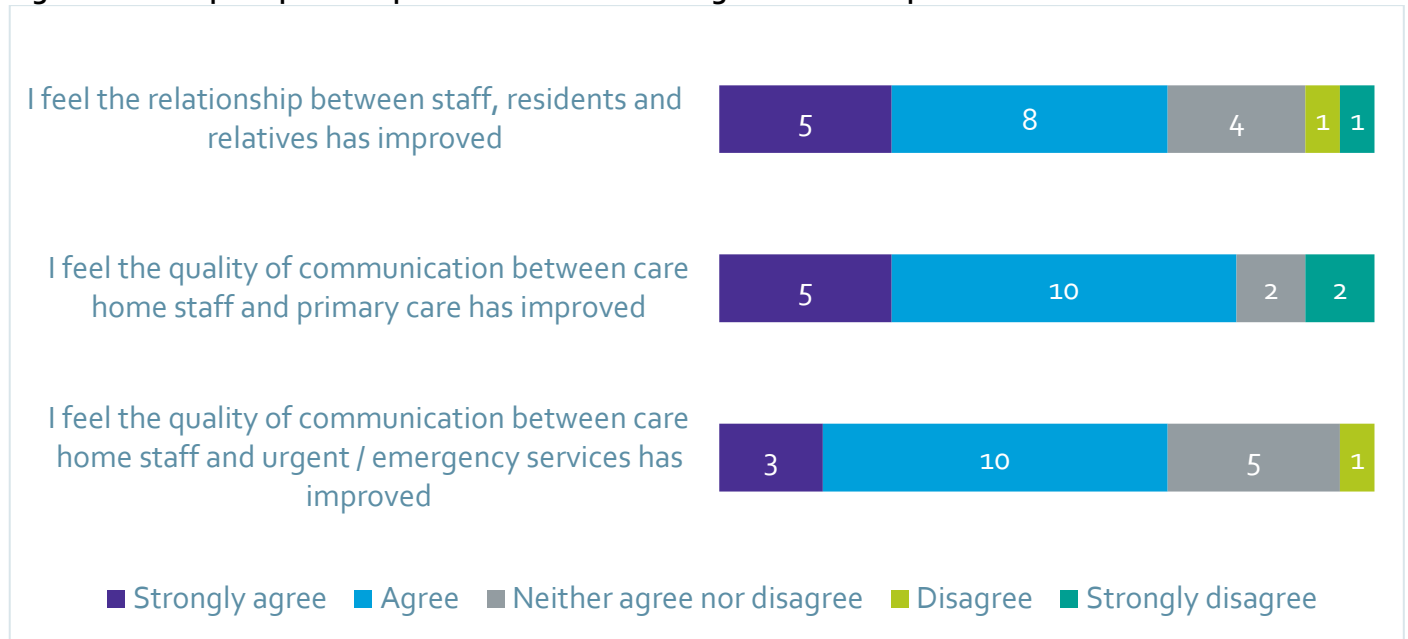
3.3.4 Did care home staff feel confident using the technology?

On the whole, care home staff responding to the survey felt confident using remote monitoring solutions in their care setting with residents; 16 respondents agreed that they were confident, one neither agreed nor disagreed and two respondents strongly disagreed.

Figure 17: Staff perception: confidence of staff using remote monitoring

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
10	6	1		2
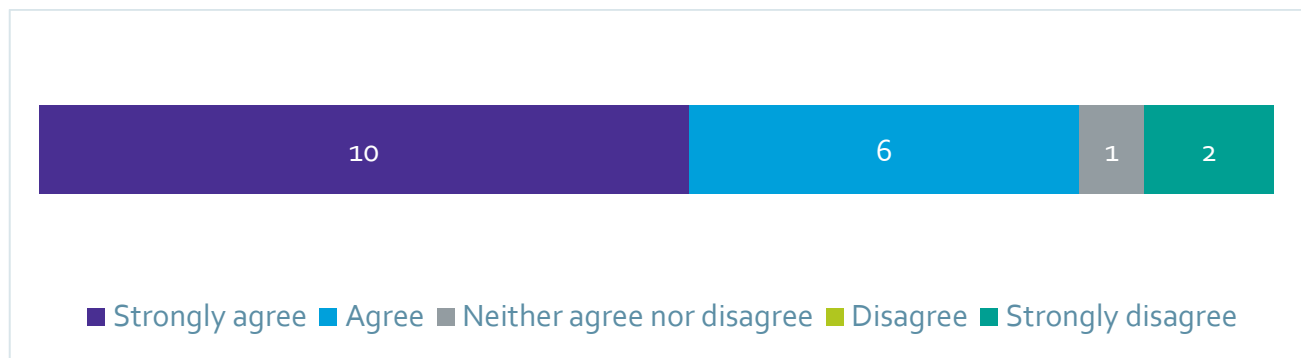
The majority of survey respondents (16) received training when the remote monitoring solution was introduced into their care setting; two respondents said that they did not receive training, and one respondent did not remember whether or not they had received training.

Of the 16 care home staff who received training when the remote monitoring solution was introduced, seven found the training to be extremely useful, a further eight felt it was very useful, and one respondent did not give a rating of the usefulness of the training. Some respondents further commented when asked to share their thoughts or suggestions on the training they received. The comments were all positive reporting that the training was informative, professional and gave them the right knowledge to train new staff.

Figure 18: Staff perception: How useful was training on remote monitoring?

| 7 | 8 |

■ Extremely useful ■ Very useful ■ Moderately useful ■ Slightly useful ■ Not at all useful
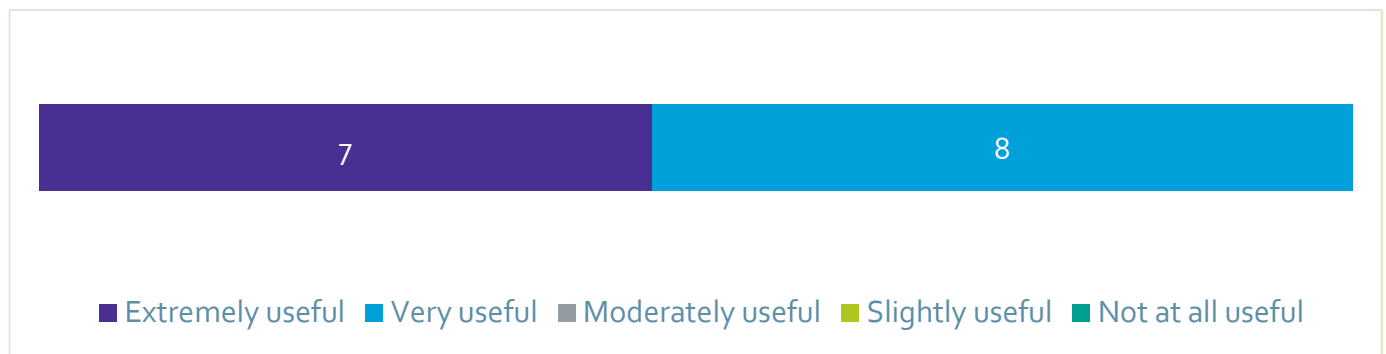
3.3.5 Did the use of remote monitoring technology impact healthcare utilisation

A total of seven care homes in south east London whose remote monitoring systems were operationally live prior to April 2021 were matched to data from the London Ambulance Service regarding rates of incidents and conveyances for each care home. The ambulance activity for a range of metrics was then measured for the period of April to December 2021 for these seven care homes. In order to understand whether there had been significant changes to these activity measures, the same time period (April to December) in 2019 was also used as a comparison to see if rates of ambulance activity had reduced during the period where remote monitoring was introduced compared to a 'pre' remote monitoring period.

As there is likely to be huge variation year on year in terms of healthcare utilisation due to a range of factors such as weather conditions, the Covid-19 pandemic and other health factors, a 'control' group of 125 care homes in south east London that did not implement remote monitoring technology was included in this analysis. The intention was to compare any changes in rates between April – December 2019 and April – December 2021 between the two groups, i.e., to test whether there was a difference between the rate of increase or reduction in the remote monitoring care homes when compared to the care homes without remote monitoring which could indicate that any change may be due to the use of remote monitoring. Please note that although the data was compared to a 'control' group, it is difficult to wholly attribute any changes to remote monitoring, especially as the post pilot implementation data was collected through the pandemic which may have skewed healthcare utilisation data.

Table 11 shows that when comparing activity for April – December 2019 and April – December 2021 for the seven remote monitoring care homes, there was an **increase** in ambulance activity with a **49%** increase in incidents, a **36%** increase in conveyances to hospital, a **5%** increase in blue calls and a **46%** increase in out of hours incidents.

When comparing to the 125 non-remote monitoring care homes, increases were also seen for **non-remote monitoring** care homes for incidents, blue calls and out of hours incidents, with a slight **reduction** in conveyances. The rates of increase in ambulance activity were much higher for care homes that **had implemented** remote monitoring for everything except for blue calls, with a 49% increase in incidents (compared to 9% increase in non-remote monitoring care homes), a 36% increase for conveyances (compared to -1% reduction for non-remote monitoring care homes), a 5% increase in blue calls (compared to a 8% increase amongst non-remote monitoring care homes) and a 46% increase in out of hours incidents (compared to a 5% increase for non-remote monitoring care homes.

Table 11: London Ambulance Service Activity for south east London care homes

		Incidents	Conveyances	Blue calls	Out of Hours
Care homes that implemented remote monitoring (n=7)	pre pilot (Apr-Dec 2019)	256	211	57	142
	post pilot (Apr-Dec 2021)	382	287	60	208
	Diff	126	76	3	66
	% diff	49%	36%	5%	46%
Care homes that did not implement remote monitoring (n=125)	Pre pilot (Apr-Dec 2019)	3057	2523	555	1599
	Post pilot (Apr-Dec 2021)	3342	2506	599	1679
	Diff	285	-17	44	80
	% diff	9%	-1%	8%	5%

We did not have access to south east London ICS emergency hospital activity data so we were unable to analyse this.

3.3.6   Summary

South east London ICS implemented Docobo technology, with training being led by the Docobo service manager. Ten care homes were operationally live (defined as care homes that were using Docobo to conduct assessments at least once a month on average between the month of their first care home resident assessment and December 2021). The majority of care home responding to a survey staff felt that remote monitoring solutions had benefitted staff residents and the wider healthcare system. Similarly, the majority felt that remote monitoring improved the quality of communication between care home staff and primary care and urgent/emergency services.

We compared healthcare utilisation activity from April – December 2019 and April – December 2021 for homes that implemented remote monitoring with homes that did not. For remote monitoring care homes, there was a greater increase in incidents (49% compared to 9% increase for non-remote monitoring), conveyances to hospital (36% increase compared to -1% reduction for non-remote monitoring), and out of hours incidents (46% compared to 5% increase for non-remote monitoring). There was however a slightly smaller increase in blue calls for those homes that implemented remote monitoring (5% increase compared to 8% increase for non-remote monitoring).

3.4   South West London

3.4.1   Overview of model

Table 12: Overview of South West London ICS model

Aim	South West London (SWL) ICS has the highest number of care homes in London. Whzan remote monitoring technology had been implemented in older people's care homes in one borough in advance of the Innovation Collaborative project. Following a procurement process the aim for NHS SWL was to: • Implement the Vcare[7] Remote Monitoring System in 5 boroughs and to • Embed the use of the Whzan[8] Blue box in older people care homes in Wandsworth and extend Whzan to MH and LD care homes in Wandsworth. The ICS established a new, remote, care homes digital integration support team to work with care homes and the suppliers
Product and usage	Whzan Blue Box contains a thermometer, pulse oximeter and blood pressure monitor, all Bluetooth-enabled to transmit readings to the tablet, with options for Wi-Fi or 3/4/5G. Care home staff access NEWS2 scores through a tablet. Data can also be reviewed from the cloud via a website. Clinicians receive individualised log ins, so they are able to view the observations. Vcare supplies Bluetooth-enabled thermometer, pulse oximeter and a blood pressure monitor which connect to a tablet. Care homes can upload readings via WiFi or a 4G MiFi Dongle or offline. Vital signs are recorded and viewable in real time via the clinical portal. Data sharing processes are embedded within the system to enable care homes to control data sharing with clinical teams, or individual clinicians. The care home remote monitoring solution utilises existing RESTORE2 patient pathways and creates a NEWS2 score. For both Vcare and Whzan, care homes were asked to complete a full set of observations in line with RESTORE2 methodology for 7 days (initially 14 days, but later reviewed). After this, a full set of observations were to be taken once a month on all residents where appropriate. This enables them to check the baseline readings, ensures staff and residents remain familiar with using equipment and provides trend data for review by the care home lead clinician. Escalation remained the responsibility of the care home, and the homes followed the agreed RESTORE2 escalation pathway for their borough. Their first point of contact may not always be the GP, for example, it may be the care home support team or 111. The Care Home Support Teams and GPs were given the option by the care home, to remotely access the dashboard to view results.
Staffing Model	Three roles were introduced to support remote monitoring. Digital Integration Support and Liaison Officers (DISLOs) worked remotely with care homes and suppliers to encourage uptake of remote monitoring, onboarding, issue

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[7] VCare Systems | Connecting The Dots In Healthcare
[8] Virtual Wards | Whzan digital health | United Kingdom

| | resolution etc.

Training was delivered virtually by the supplier with support DISLOs.

Digital Integration Support Adviser (DISA) roles were introduced to focus on engagement and post implementation follow up.

Clinical Digital Educator (CDE) roles were established to go into care homes and support staff to change practice, train them to use the equipment to take vitals readings and refresh knowledge on the RESTORE2 pathway.

For further information on these roles, please see the separate case studies shown in the appendix. |
|---|---|
| Additional support provided | Online 'showcase' launch events were held for care homes, and for GPs and community teams, featuring a live demo and an overview of the project's purpose and benefits |

3.4.2 Was the technology used when implemented?

Two remote monitoring products were deployed in south west London during the pilot period. Vcare was implemented in 63 care homes, and Whzan was implemented in nine care homes, meaning that 72 care homes across south west London were operationally live with remote monitoring solutions. Both products collect utilisation data based on the number of residents assessed each month.

An average (median) of six residents were assessed (observation(s) taken) per month per care home for VCare homes. Homes using Whzan had a much higher median utilisation rate of 38 residents with readings per care home per month.

VCare
In south west London, 77 care homes trialled VCare between May and December 2021, and 63 care homes became operationally live (defined as care homes that were using VCare to conduct assessments at least once a month on average between the month of their first assessment and December 2021).

There was a gradual month on month increase in operationally live care homes, with four care homes going live in May 2021 and this gradually increasing each month until there were 63 operationally live care homes by December 2021.

Information on the number of care home residents assessed (observation(s) taken) each month was provided by VCare and gives a sense of monthly utilisation in figure 19. Unfortunately, the VCare data does not include the actual number of assessments that were made which is likely to be higher due to some residents having more than one assessment taken each month. Figure 19 displays the progression in the number of operationally live care homes by the number of residents, demonstrating a clear upward trend in the number of residents as more care homes became operationally live.

Figure 19: No of operationally live care homes by no of residents assessed using VCare – monthly time trend
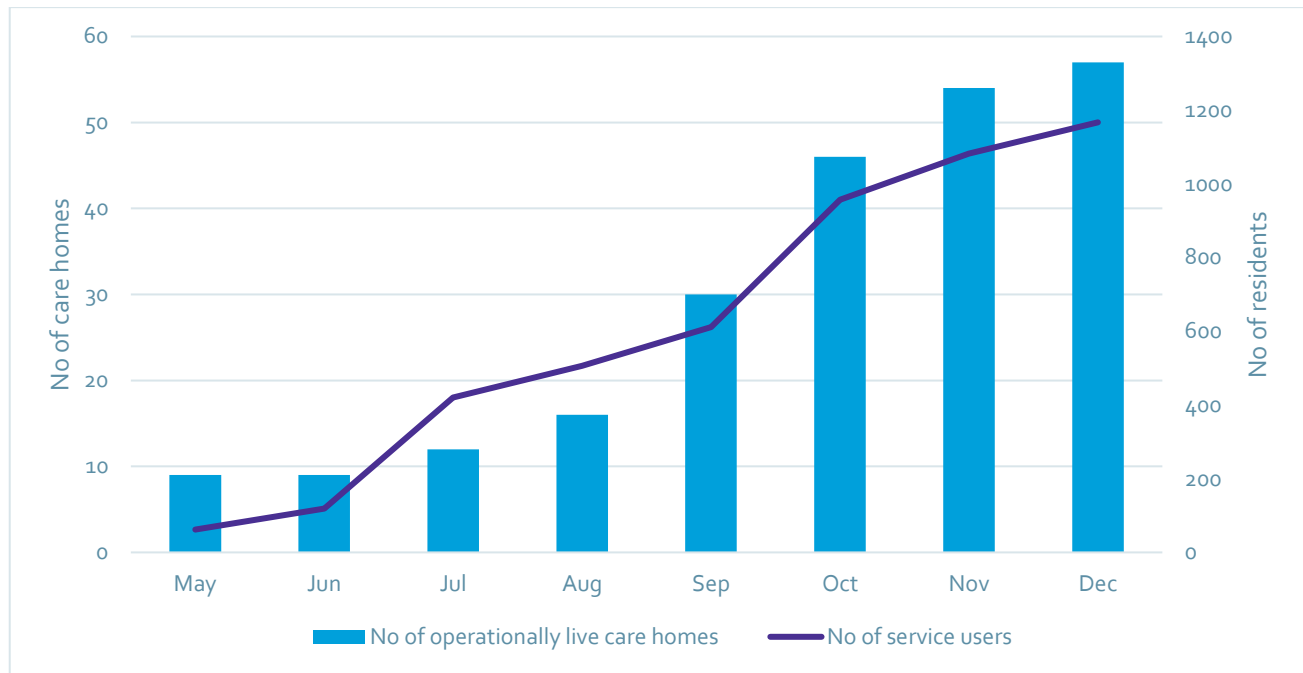
On average (median) six residents were assessed per care home per month throughout May to December 2021, with an interquartile range of 18.

The number of residents with assessments per care home each month varied month on month and over time. Toward the end of the data collection period (December 2021), there were more care homes that were not using the kit, and reduced proportions of care homes that were assessing more than 20 residents by December 2021. Even so, by December 2021 68% of operationally live care homes were still conducting assessments on one or more residents.

Figure 20: No of care homes by no of residents with assessments carried out per care home per month – time trend

Whzan

In south west London nine care homes re-engaged with Whzan between January 2020 and December 2021 and all became operationally live (defined as using Whzan to conduct resident readings at least once a month on average between the month of their first resident reading and December 2021).

There was a gradual increase in operationally live care homes, with one care home being live in January 2020, up to nine being live by November 2021.

Information on monthly residents with readings was provided by Whzan and gives a sense of monthly utilisation. Unfortunately, the Whzan data does not include the actual number of readings taken which is likely to be higher due to some residents having more than one reading taken each month. Figure 21 displays the progression in the number of operationally live care homes by the monthly number of residents with readings. Overall, this shows an upward trend in the number of residents with readings as more care homes became operationally live, with quite large variation month on month in utilisation rates.

Figure 21: No of operationally live care homes by no of residents assessed using Whzan – monthly time trend
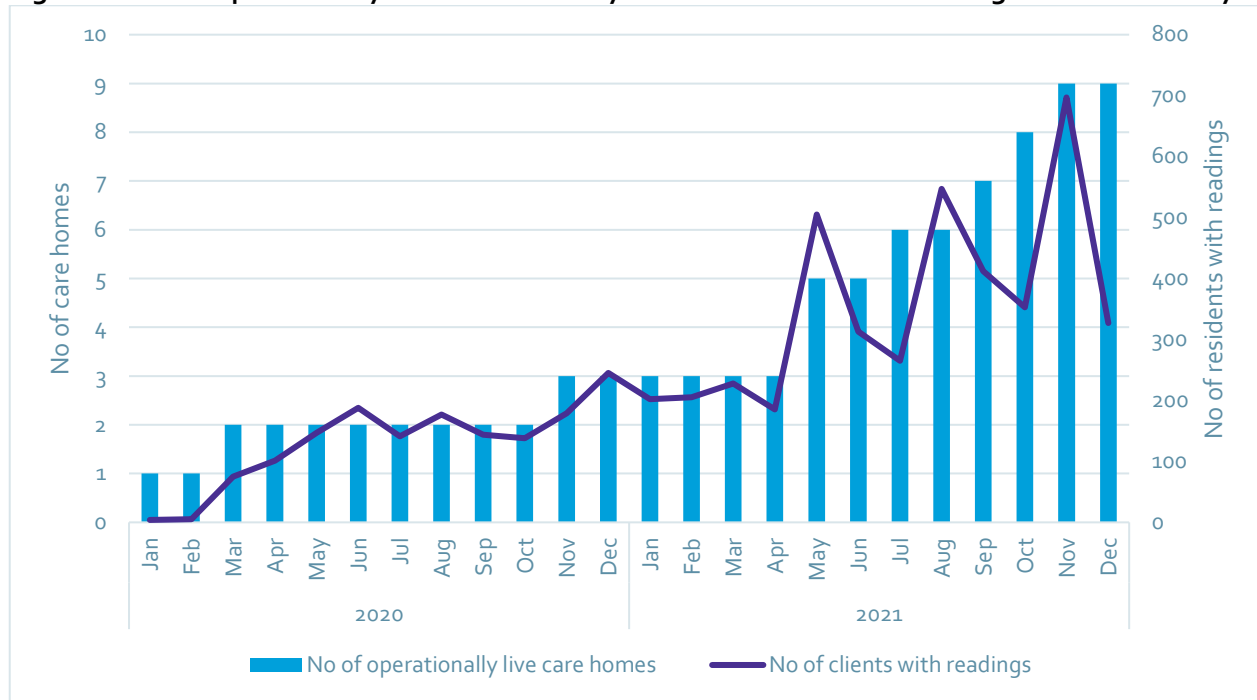
On average (median) there were 38 residents with readings, per care home per month from Jan 2020 to December 2021, with a large variance between care homes and months, giving an interquartile range of 113.

The number of resident readings per care home each month was quite stable throughout the period of data collection, with around half of care homes having 20 or more residents with readings per month. By December 2021, seven of the nine care homes were still conducting resident readings, with five of these having high utilisation of 20 or more residents with readings in December 2021.

Figure 22: No of care homes by no of residents with assessments carried out per care home per month – time trend
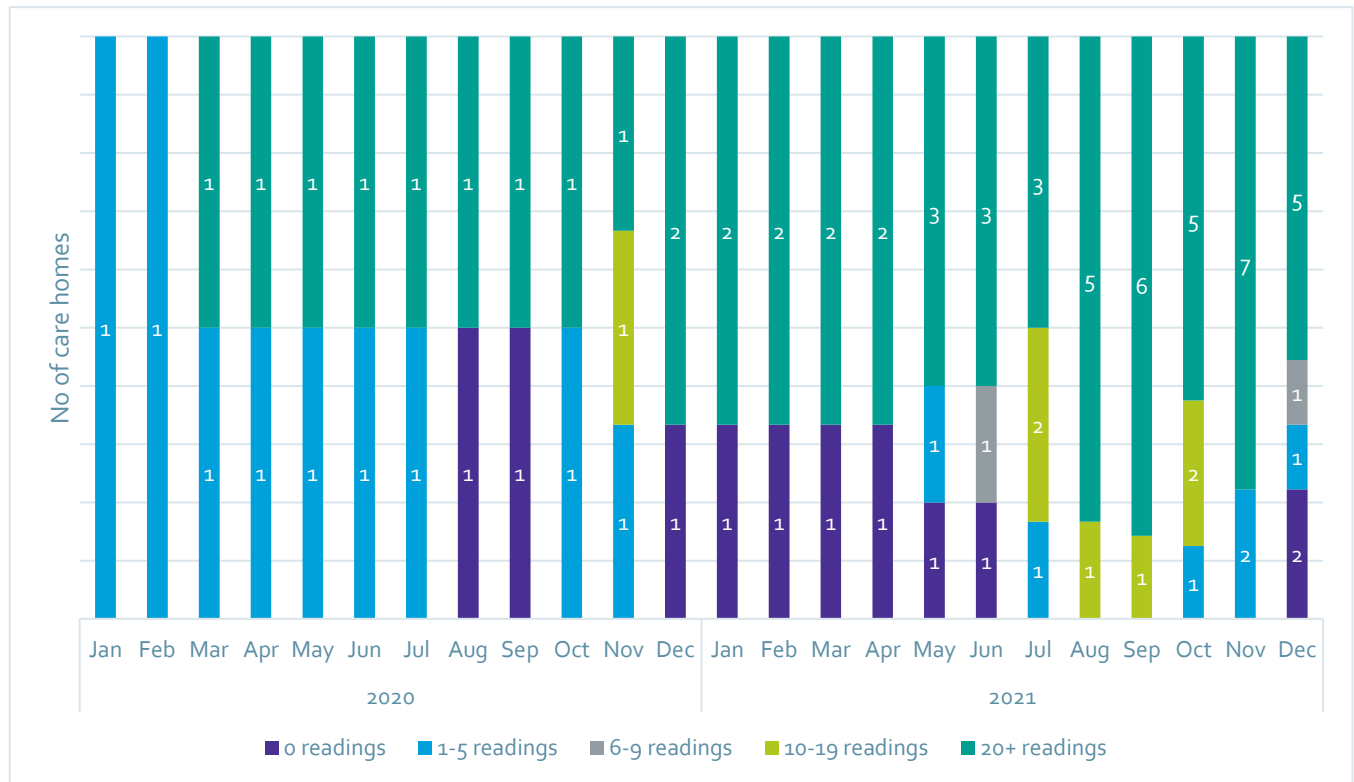
### 3.4.3 Did care home staff perceive benefits?

A survey was sent out on 3 February 2022 to care workers working in each of the care settings that implemented a remote monitoring solution. The survey was sent both to homes that had implemented Vcare and those that had implemented Whzan.

The analysis below is of the views of care home staff after implementation of the remote monitoring solution. A total of 47 members of staff working in care settings in south west London responded to the survey, including 16 registered managers, nine deputy managers, 13 carers, seven nurses and two other members of staff. All survey responders had used the remote monitoring solution available in their care home.

A large number of survey respondents felt that remote monitoring solutions in care settings had benefitted staff (36), residents (36) and the wider healthcare system (38), with five survey respondents disagreeing that it had benefitted staff, four disagreeing that it had benefitted residents and four disagreeing it had benefited the wider healthcare system.

Figure 23: Staff perception: has remote monitoring brought benefits?
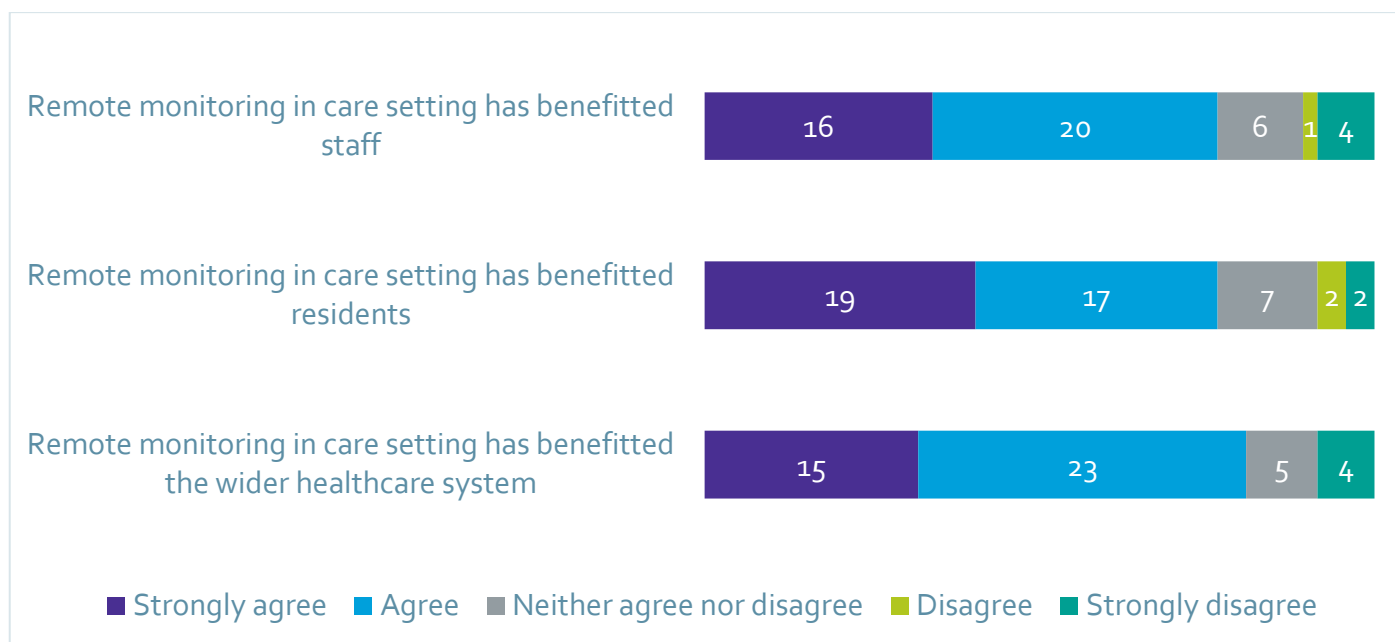
Statement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Remote monitoring in care setting has benefitted staff	16	20	6	1	4
Remote monitoring in care setting has benefitted residents	19	17	7	2	2
Remote monitoring in care setting has benefitted the wider healthcare system	15	23	5		4

Respondents were asked if they felt the remote monitoring solution adopted in their current care setting had changed the way they care for residents, with mixed views. Whilst the majority (28) of respondents felt it had, 11 respondents felt it had not and eight respondents were unsure. Thirty-two respondents further commented when asked to share any thoughts related to their answer and a total of 25 commented at the end of the survey, when asked for '*any other information you would like to share about your experience with remote monitoring when caring for residents?*'

Staff reported that they were able to monitor residents regularly so issues could be picked up earlier, able to see trends and reports of observations and could spend more quality time with residents. It was also noted that remote monitoring improved collaboration with GPs and other professionals as observations could be sent straight away with immediate advice:

"It is very easy to pick up deterioration in a resident`s condition the system gives you a score, it is also helpful when speaking with the emergency services/111."
Nurse

The need for remote monitoring data to be accessible to other healthcare services was raised along with the need of functional equipment at the homes such as blood pressure machines.

There was generally agreement that remote monitoring had improved aspects of communication. Many (25) agreed remote monitoring had led to improvements in relationships between staff, residents and relatives, with a further 16 respondents neither agreeing nor disagreeing and six respondents disagreeing.

"I find it a better way of communicating between MDT and resident and family."
Nurse

Similarly, when asking care home staff whether the quality of communication between care home staff and primary care had improved, 26 agreed it had, 15 neither agreed nor disagreed and six disagreed.

Most (25) agreed that communication between care home staff and emergency services had improved, with 17

respondents neither agreeing or disagreeing and five disagreeing.

"It's great - we have every information on fingertip which makes things easy and quick in an emergency"
Registered Manager

Figure 24: Staff perception: impact of remote monitoring on relationships and communication

I feel the relationship between staff, residents and relatives has improved: 8, 17, 16, 3, 3

I feel the quality of communication between care home staff and primary care has improved: 7, 19, 15, 2, 4

I feel the quality of communication between care home staff and urgent / emergency services has improved: 6, 19, 17, 1, 4

■ Strongly agree ■ Agree ■ Neither agree nor disagree ■ Disagree ■ Strongly disagree
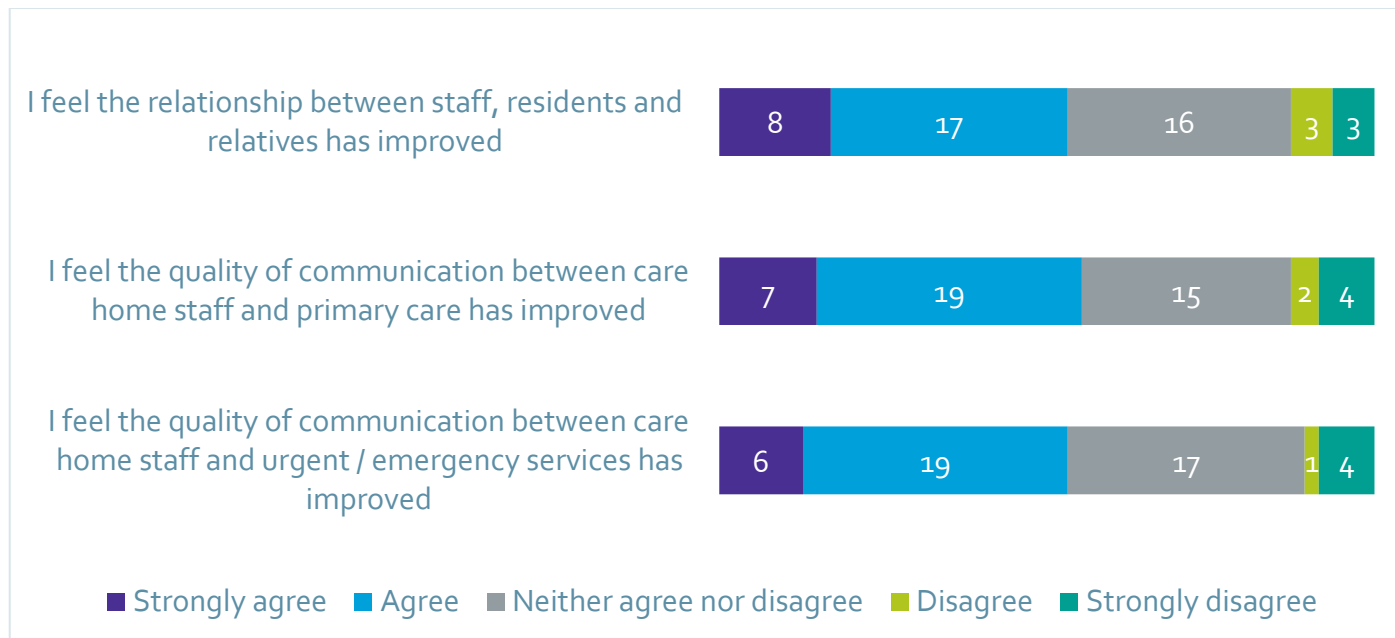
3.4.4 Did care home staff feel confident using the technology?

On the whole, care home staff responding to the survey felt confident using remote monitoring solutions in their care setting with residents. Forty-three respondents agreed that they were confident, two neither agreed nor disagreed and two respondents strongly disagreed.

Figure 25: Staff perception: How useful was training on Remote Monitoring?

20, 23, 2, 2

■ Strongly agree ■ Agree ■ Neither agree nor disagree ■ Disagree ■ Strongly disagree
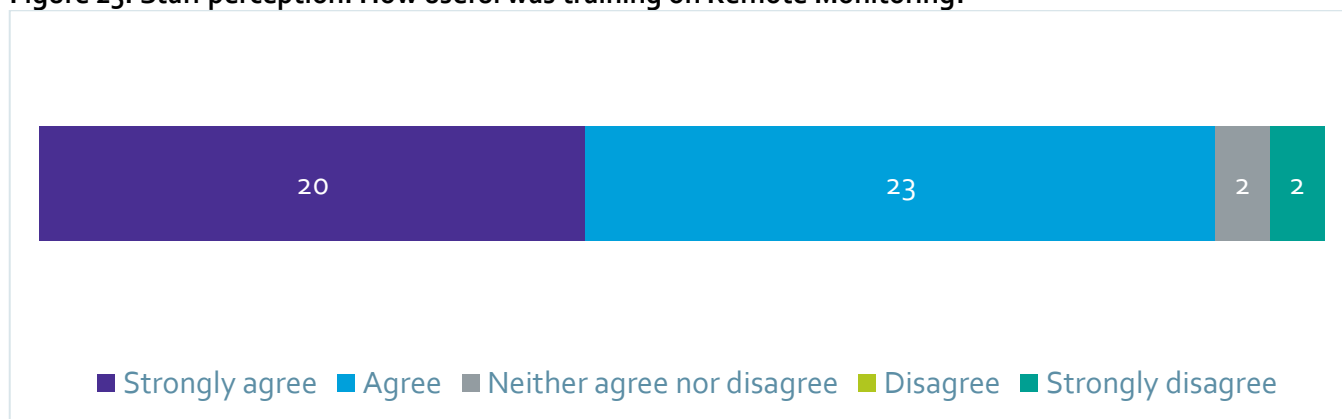
Almost all (43) respondents received training when the remote monitoring solution was introduced into their care setting; three respondents could not remember whether they received training and one respondent did not work at the care setting at the time the remote monitoring solution was introduced.

Of the 43 care home staff that received training when the remote monitoring solution was introduced, 13 found the

training to be extremely useful, 24 felt it was very useful, five found it moderately useful and one slightly useful.

Thirty-five respondents further commented when asked to share their thoughts or suggestions on the training they received. It was reported that the training was interactive, knowledgeable, and useful. However, it was felt that the training was rushed so it could have been longer. It was also noted that a lot of information was covered in the training so an instruction/reference booklet should have been provided before. The need for refresher training was also reported along with the suggestion of making the training relevant for residents.

Figure 26: How useful care home staff found the training

| 13 | 24 | 5 | 1 |

■ Extremely useful ■ Very useful ■ Moderately useful ■ Slightly useful ■ Not at all useful
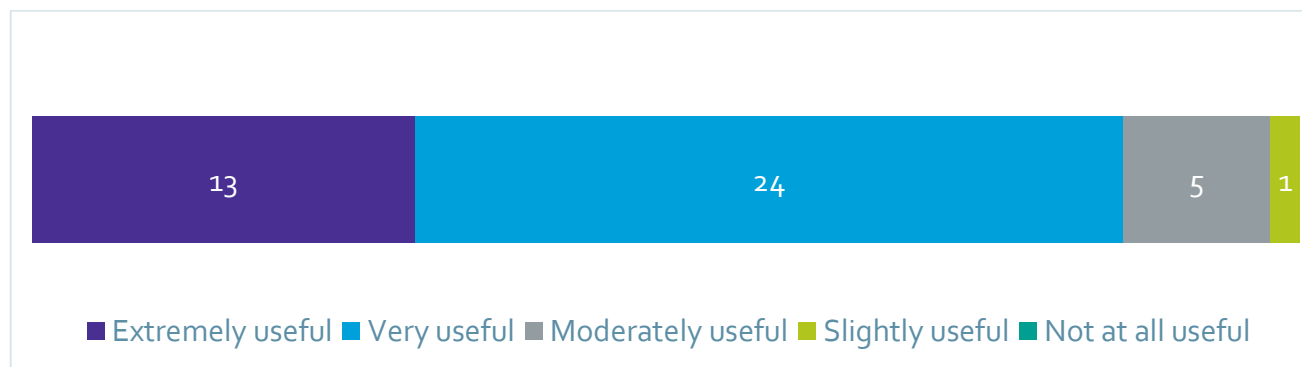
3.4.5 Did the use of remote monitoring technology impact on healthcare utilisation

A total of 30 care homes in south west London whose remote monitoring systems were operationally live prior to October 2021 were matched to data from the London Ambulance Service regarding rates of incidents and conveyances for each care home. The ambulance activity for a range of metrics was then measured for the period of October to December 2021 for these 30 care homes. In order to understand whether there had been significant changes to these activity measures, the same time period (October to December 2019) was also used as a comparison to see if rates of ambulance activity had reduced during the period where remote monitoring was introduced compared to a 'pre' remote monitoring period.

As there is likely to be huge variation year on year in terms of healthcare utilisation due to a range of factors such as weather conditions, the Covid-19 pandemic and other health factors, a 'control' group of 103 care homes in south west London that did not implement remote monitoring technology was included in this analysis. The intention was to compare any changes in rates between October – December 2019 and October – December 2021 between the two groups, i.e. to test whether there was a difference between the rate of increase or reduction in the remote monitoring care homes when compared to the care homes without remote monitoring, as this could indicate that any change may be due to the use of remote monitoring. Please note that although the data was compared to a 'control' group, it is difficult to wholly attribute any changes to remote monitoring, especially as the post pilot implementation data was collected through the pandemic which may have skewed healthcare utilisation data.

Table 13 shows that when comparing activity for October – December 2019 and October – December 2021 for the 30 remote monitoring care homes, there was an **increase** in ambulance activity with a **9%** increase in incidents, a **3%** increase in conveyances to hospital, a **11%** increase in blue calls and a 19% increase in out of hours incidents.

When comparing to the 103 **non-remote monitoring** care homes the picture was quite different. For these homes, reductions in ambulance utilisation were seen for incidents (10% reduction), conveyances (14% reduction) and out-of-hours incidents (12% reduction) and there was a slight increase in blue calls over the same period. The increase in blue ambulance activity between pre and post remote monitoring periods were much higher for care homes that **had** implemented remote monitoring, with a 11% increase in blue calls compared to a 1% increase amongst non-remote monitoring care homes.

Table 13: London Ambulance Service Activity for south west London care homes

		Incidents	Conveyances	Blue calls	Out of Hours
Care homes that implemented remote monitoring (n=30)	pre pilot (Oct-Dec 2019)	374	310	88	192
	post pilot (Oct-Dec 2021)	407	319	98	228
	Diff	33	9	10	36
	% diff	9%	3%	11%	19%
Care homes that did not implement remote monitoring (n=103)	Pre pilot (Oct-Dec 2019)	879	709	184	474
	Post pilot (Oct-Dec 2021)	795	609	186	416
	Diff	-84	-100	2	-58
	% diff	-10%	-14%	1%	-12%

Data on **emergency hospital care** was obtained from South West London ICS to help understand if remote monitoring in care homes had impacted on the need for emergency healthcare services. It was possible to match 30 care homes in south west London that had implemented remote monitoring prior to October 2021 to the hospital care home dataset which included data on A&E attendances, non-elective admissions and readmissions as well as data on the length of stay in hospital of care home residents that had a non-elective admission.

In order to compare the rates of A&E attendances and non-elective admissions to general trends at the time, a group of 142 care homes in south west London that did not implement remote monitoring were selected as a comparator.

When comparing the rates of emergency hospital activity between October and December 2021 when remote monitoring had been implemented in these 30 care homes to the same time period (October to December) in 2019, rates were relatively stable with a small increase of 19 A&E attendances (6% increase), a small reduction of four non elective admissions (-2% reduction) and a reduction of 12 readmissions (-26% reduction).

When comparing to changes between the same two time periods for those care homes that had **not** implemented remote monitoring there was a -8% reduction in A&E attendances (compared to a 6% increase amongst remote monitoring care homes), a stable number of non-elective admissions with only a -0.7% reduction amongst homes without remote monitoring (similar to the -2% reduction for remote monitoring care homes) but a much lower reduction of -3% was seen in readmissions compared to a -26% reduction for remote monitoring care homes.

Table 14: Emergency hospital activity for South West London care homes

	A&E attendances		Non- elective admissions		Readmissions	
	Remote monitoring (30)	No remote monitoring (142)	Remote monitoring (30)	No remote monitoring (142)	Remote monitoring (30)	No remote monitoring (142)
pre pilot (Oct-Dec 2019)	331	1074	270	696	47	117
post pilot (Oct-Dec 2021)	350	992	266	691	35	114
Diff	19	-82	-4	-5	-12	-3
% diff	6%	-8%	-2%	-0.7%	-26%	-3%

In terms of **length of stay** in hospital for non-elective admissions there was a slight reduction in the proportion of non-elective admissions that had shorter length of stays (up to seven days) amongst care homes that implemented remote monitoring with 59% of admissions being up to seven days prior to implementation compared to 54% for the post implementation period (October to December 2021). Longer stays of eight to 21 days slightly increased from 22% up to 26% while stays of 22 or more days remained relatively stable at 20% of non-elective admissions (compared to 19% for the pre remote monitoring period).

When comparing the changes between pre and post remote monitoring length of stays to the group of care homes that did **not** implement a remote monitoring solution, both groups had a reduced number of non-elective admissions with stays of up to seven days, with the homes **without** remote monitoring having a bigger reduction of -16% compared to -10% for homes that had implemented remote monitoring. Conversely whilst both groups had an increase in non-elective admissions with stays of 22 or more days the increase was bigger for those homes without remote monitoring with a 31% increase compared to an 8% increase for homes with remote monitoring.

Table 15: Length of stay of care home resident non elective admissions – south west London

	0-7 days		8-21 days		22+ days	
	Remote monitoring (30)	No remote monitoring (142)	Remote monitoring (30)	No remote monitoring (142)	Remote monitoring (30)	No remote monitoring (142)
pre pilot (Oct-Dec 2019)	160 (59%)	397 (57%)	60 (22%)	184 (26%)	50 (19%)	115 (17%)
post pilot (Oct-Dec 2021)	144 (54%)	334 (48%)	68 (26%)	206 (30%)	54 (20%)	151 (22%)
Diff	-16	-63	8	22	4	36
% diff	-10%	-16%	13%	12%	8%	31%

3.4.6   Summary

South West London ICS implemented Vcare and re-engaged homes that had implemented Whzan with the support of DISLOs (Digital Integration Support and Liaison Officers) and DISA (Digital Integration Support Adviser) roles.

Sixty-three care homes that used Vcare became operationally live (defined as care homes that were using the technology to conduct assessments at least once a month on average between the month of their first assessment and December 2021) and nine became operationally live with Whzan.

The majority of the care home staff felt that remote monitoring solutions had benefitted staff, residents and the wider healthcare system. Moreover, there was generally agreement that remote monitoring had improved aspects of communication.

We compared healthcare utilisation activity from April – December 2019 and April – December 2021 for homes that implemented remote monitoring with homes that did not. For remote monitoring care homes, there was an increase in incidents, conveyances to hospital, out of hours incidents and blue calls. In the homes that had not implemented remote monitoring, an increase was only seen in blue calls, and this was just a 1% increase.

In homes that had not implemented remote monitoring, there was reduction in A&E attendances, a stable number of non-elective admissions and a much lower reduction in readmissions than in homes that had implemented remote monitoring.

Changes in admissions and length of stay data over the same two time periods was compared between the same two sets of homes. For homes without remote monitoring, there were much larger reductions in stays of up to seven days and also a larger increase in stays of 22 or more days.
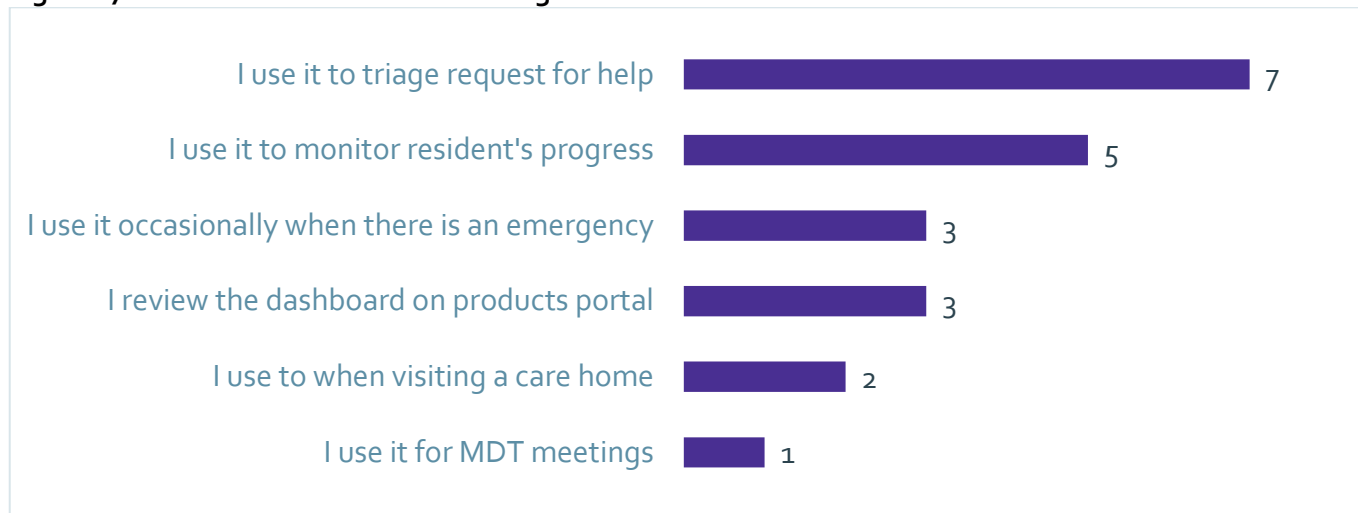
3.5   Did GPs see benefits?

From this point forward in the report, data has been considered across all of the ICSs in the evaluation and is not separated out by individual ICSs.

A short survey was sent out to GP practices involved in supporting care home residents using their local remote monitoring solution following implementation of the solution. A total of 11 survey responses were received.

As the number of completed surveys was so small, the analysis below gives the combined views of all 11 GP practices that gave their views. NCL did not send the survey to GPs, as they carried out a separate qualitative piece of work in conjunction with University College London Partners (UCLP). More information can be found in the conclusion section of the report. The data referred to below therefore covers survey responses from GPs from the other three ICSs in this evaluation.

GPs were asked how they used the remote monitoring solution available to them to monitor residents in care settings. GPs were asked to give all types of reasons that they had used their remote monitoring solution for, so numbers exceed 11 in Figure 27 as many survey respondents listed several reasons. The most common situation was *to triage a request for help* (seven respondents), followed by *to monitor a resident's progress* (five respondents), *occasional use when there is an emergency* (three respondents) and *to review the dashboard* (three respondents). The full list of reasons can be seen in Figure 27.

Figure 27: How GPs use remote monitoring solutions to care for residents

Use	Count
I use it to triage request for help	7
I use it to monitor resident's progress	5
I use it occasionally when there is an emergency	3
I review the dashboard on products portal	3
I use to when visiting a care home	2
I use it for MDT meetings	1

All survey respondents were asked whether using the remote monitoring solution had changed the way they work; nine respondents said it had changed the way they work, and two said it had not. Nine respondents further commented when asked how this has changed the way they work. GPs reported that remote monitoring improved access to resident's observations so they could better assess and triage patient's conditions:

"Patient care is optimised as I get all the information, I need regarding through the Docobo prior to making a management plan. Helps me triage in terms of how quickly the concern raised by care home staff needs to be addressed etc."

Remote monitoring also helped make communication with care homes more efficient as GPs had access to all relevant information and the context when they were contacted by care homes.

In the survey, GPs were presented with a list of statements about some of the benefits of using remote monitoring in care settings. They were asked to rate their level of agreement with each type of benefit.

On the whole, views around each benefit were quite mixed. Most (seven) GPs felt that the information provided to them via their remote monitoring platform had helped them to care for residents; however, one neither agreed nor disagreed and three strongly disagreed. Similar numbers (seven) felt that remote monitoring had improved the delivery of healthcare for residents, and four respondents disagreed. There were also mixed views around whether remote monitoring had resulted in more appropriate use of the wider healthcare system - six respondents agreed it had, whilst five respondents disagreed. The same pattern was seen regarding whether GPs felt that remote monitoring had led to improved communication between care home staff and primary care; six respondents agreed it had and five disagreed.

Figure 28: GPs agreement with remote monitoring benefit statement
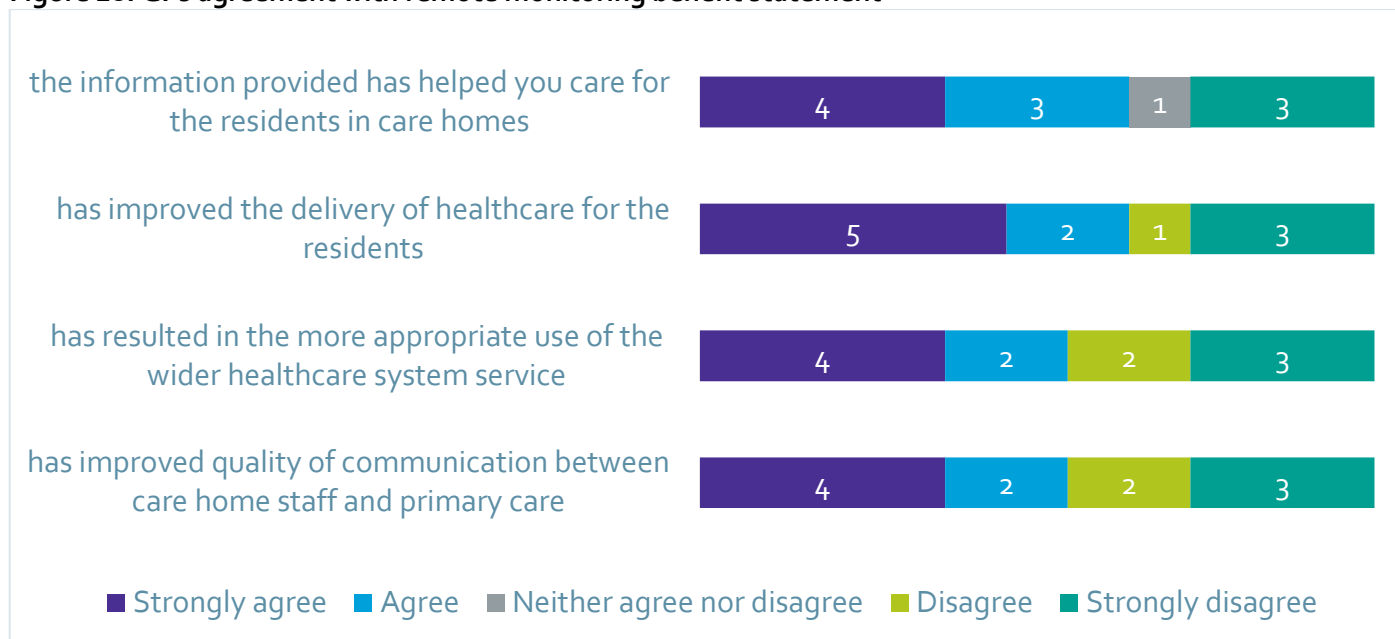
Despite mixed views regarding the benefits of remote monitoring in care settings, **all GPs** that responded to the survey agreed that they would **recommend** that other care homes take up the use of remote monitoring solutions to care for residents.

3.6 What factors are essential to make the model effective to enable greater spread and adoption?

In order to understand the factors essential to making a care home remote monitoring model effective, ICS delivery teams were interviewed to understand their experiences and learnings. It is important to highlight this is feedback from four of London's five ICSs, who each had bespoke project structures. What is clear is while there was much shared learning, there were naturally differences in the approaches. A total of four interviews were held - one with each ICS, each with two interviewees.

Their responses to the following areas of investigation are described in sections 3.6.1 – 3.6.5

3.6.1 What worked well when considering procuring and implementing remote monitoring solutions in the care home setting?

Figure 29: Procuring and implementing remote monitoring solutions: success factors
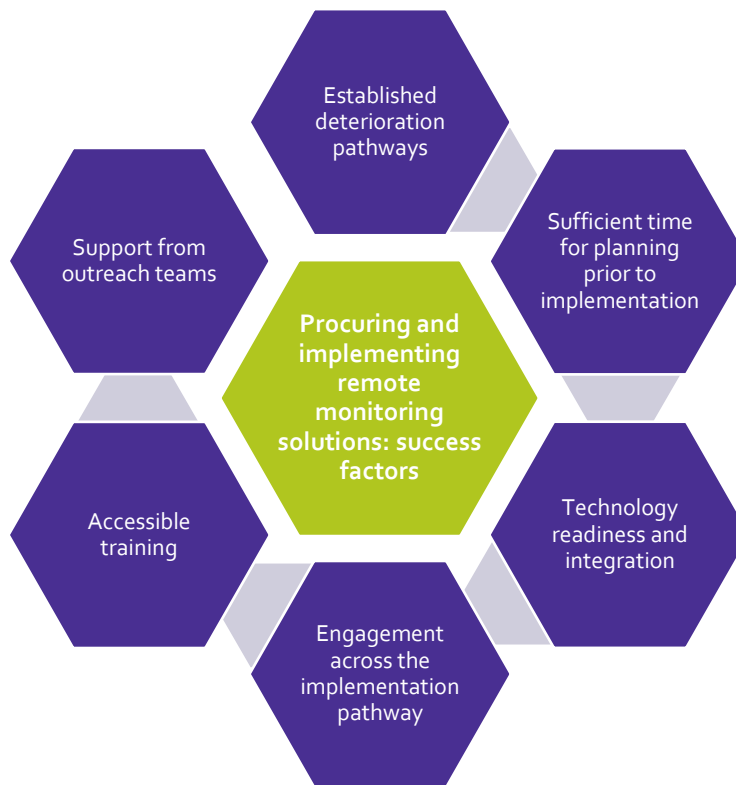
Established deterioration pathways

Where clinical pathways were already established for deterioration tools such as RESTORE2, engagement and implementation were reported to be more efficient as it made it easier to scale the project.

Aligning the clinical pathways across the ICS was also identified as an important factor. Where pathways needed more development (e.g., in mental health and learning disabilities homes where NEWS2 is largely not in use), it was important to work with them uniquely, particularly focusing on supporting the implementation and training of NEWS2 before they could use RESTORE2, as evidenced by one of the ICS leads below.

> *"We have two different suppliers...delivery of model is different for both. We are trying to align the clinical pathway e.g. one of our suppliers was just doing NEWS2 and the other supplier was only doing RESTORE2, so we have tried to embed RESTORE2 rather than just doing NEWS2 as our clinicians felt irrespective of the supplier, pathway should be similar across the for the residents across the ICS."*

> *"My recommendation is that there is one clear pathway that is agreed and therefore remote monitoring supports that clinical pathway and not having to implement very different delivery models etc."*

Sufficient time for planning prior to implementation

ICSs report that it was helpful to identify a core group of individuals from across the pathway who could work together to refine the model before implementing the project.

Accessible training

ICSs found the implementation easier and less labour intensive where training for care home staff and GPs was provided by the suppliers, and where providers directly contacted the users to organise the training. One of the ICSs welcomed the use of an app which signposted care home staff to videos and training on how to take vitals and included videos from suppliers on how to use the technology.

Furthermore, the use of virtual training allowed for a greater training capacity and more timely training.

Engagement across the implementation pathway

The importance of engagement across the pathway involving a wide range of stakeholders was clear from interviews with all ICSs.

Weekly meetings were held from the start of the project which brought together the London delivery teams from different ICS areas to share learnings and struggles. This was found to be useful as it prevented them from working in silos.

Those ICSs who held established relationships with care homes and GPs from previous successful projects found implementation much easier. One of the ICSs identified that a key enabler for programme engagement was having buy-in from all stakeholders that were involved and a clear offer on paper before signing the service agreement. Agreeing a joint vision at the start of the project was seen as important and could then be used as a guide throughout programme delivery:

"Key was that we all had the same vision that includes myself, clinical leads, the local authorities, the clinical commissioning groups - we all had the same vision, and we all wanted the same things and I think that made a massive difference in the beginning that we were all reading from the same page. I think it is also key to say that this has continued and as people have come on board, they have joined with that vision because they are very clear about what that is."

Engagement was also key for successful procurement, ensuring representation from across the different sectors (e.g., nurses, local authorities, care homes and GPs).

Having suppliers that kept regular contact and were quick to respond to technical and pathway support was also reported to be key to project success.

The importance of working with care home managers to understand what they currently do and then tailoring pathway design and training accordingly was also highlighted.

Support and engagement from the national team was also reported to be key factor as a few teams and care homes were visited by them which brought the funders to life and helped staff feel more supported.

In addition, a few ICS teams found it motivating to be invited to present at conferences to share learnings with a wider audience.

Finally, additional key roles that were essential for some ICSs for engagement were an EHCH (Enhanced Health in Care Homes) GP lead who helped with primary care engagement, a strong borough support team or working group with local resource including GPs, and well as a wider ICS strategic working groups which included the project leads.

Technology readiness and integration

One of the ICSs identified that it was important that products were readily available and required little or only minor bespoke developments according to local needs, as opposed to products that required a fully bespoke build or did not have care home usability. Although remote monitoring didn't integrate with patient records system in all ICSs, some felt that being able to integrate with the electronic patient record system was important to achieve buy-in from all users.

Support from outreach teams

Some of the ICSs recruited outreach teams to support care homes. One described how they had focused on selecting these staff for their 'soft' (interpersonal) skills. This was identified as an enabler that allowed them to form strong relationships with the care homes and ensured that the programme of work was done *with* them and not *to* them:

"One of the things that has been quite interesting with regards to our model of implementation was the DISLOs and the fact that we recruited people not based necessarily on their experience with care homes but on their soft skills and interpersonal skills because a fundamental part of all this has been building relationships and providing support to the care homes."

It was reported that outreach teams were effective in building relationships external to the care home, e.g. with local authorities, GPs and physiotherapists and were therefore able to get more insight to which care homes might need more support, thereby further improving the support offered to care homes.

One ICS reported that designing the outreach teams' programmes of work to include wider objectives worked well, e.g. supporting care homes who did not want the technology initially with care-related training, to build relationships and then being able to support with remote monitoring when they felt ready for the technology.

3.6.2 What have been the learnings around design and delivery that can be incorporated into future rollouts to improve implementation?

Figure 30: Considerations for future implementation of remote monitoring in care homes
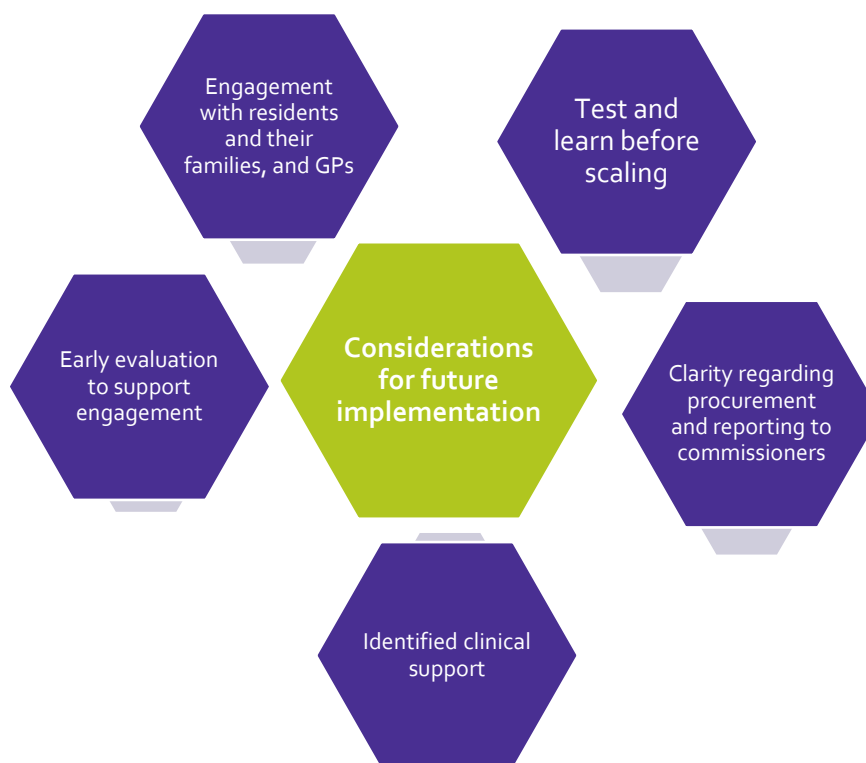
Engagement with residents and their families, and GPs

Limited engagement took place with residents and their families. When interviewed, almost all ICSs stated that clear communication was required with residents and their families when the pathways were being designed, updated and implemented. It was noted that restrictions due to Covid-19 made this more difficult. It was suggested that inviting residents to train sessions would support their understanding in how the technology would be used, as would face-to-face time for staff, residents and their families to socialise the aims of the technology and the new processes that would be put in place, giving everyone the opportunity to ask questions:

"Because of Covid we struggled to do the piece of work around residents and relatives that would have been easier to do before Covid...but later when we started to get back into homes, we positively encouraged residents to come in and be part of the training....that brings a lot of joy as residents love to tell us all about their blood pressure and we get to hear their stories but also the key thing is we see people interacting with each other. So, for me it I would have loved to have done more work with residents and relatives beforehand because they are key."

"We are collecting data, but actually we need to think about what that data means for residents and their families...we are doing it, but I wish we had done it much earlier but because of the pressures we are on to crack on that...wish we could have done it earlier and I would have loved to have captured what the residents and their families think."

Some ICSs reported that despite a huge amount of GP engagement, this had still not been sufficient, and that more clinicians needed to be involved, including community nurses and pharmacists. It was suggested that to improve embedding of remote monitoring into the primary care pathways, it should be included in GP contracts. When one of the ICS leads investigated why one of their care homes had a better usage of remote monitoring than the rest, it

was because:

"The GP asked for it [the information from the remote monitoring technology]. If the GP doesn't ask for it, they [care home staff] are less likely to do it."

Conversely, some care home staff and GPs were ambivalent to the use and benefits of remote monitoring technology in care homes, and additional engagement plans were recommended to work with this group to support future engagement.

Identified clinical support

Having dedicated clinical support (e.g. a lead nurse or GP) was identified as key when questions arose from outreach teams or care home staff (who typically did not have a clinical background or clinical training).

The importance of setting up a task and finish group that included representation from all staff groups was also highlighted.

One ICS reported that this project took longer, and used more resource than originally thought, mainly because of the need to understand the current pathway and to set up additional operational support where needed.

It was suggested that the governance structure should include representation from the local authority to ensure that the responsibilities of leading and delivering the programme of work are clear to all.

Test and learn before scaling

Some interviewees said that where bespoke technology was created, this allowed for greater user engagement but also took additional time for development and testing of the pathways before scaling which held up onboarding of care homes. It was suggested that a smaller pilot could have been beneficial to allow for easier onboarding of care homes, and gathering of feedback and learnings before then scaling up with a refined model. It was thought this would also help with collecting evidence in the early stages to support engagement and utilisation:

"If I were to start the project again, I would have done a smaller pilot of about 10 care homes which would be easy to monitor, get them on board, they know that they are part of the pilot, they can do it and then the word can travel…this would also help get evidence and utilisation data through more easily."

Some ICSs felt that the onboarding of GPs should be prioritised ahead of the care home managers to improve the utilisation, although acknowledging this is likely technology and pathway dependent.

Clarity regarding procurement and reporting to commissioners

The timelines for procurement set by the national team meant ICSs had to submit the names of the selected care homes for implementation before they could be engaged. Ideally engagement should have been done beforehand to allow for a more accurate and realistic goals to be set. Interviewees mentioned that more defined support on the procurement process would have been helpful, including information governance processes. Also, having clearer reporting responsibilities and a schedule of requirements from both the national and regional team would have allowed for better local planning.

Early evaluation to support engagement

The evaluation was commissioned to be delivered at the end of the Innovation Collaborative project. It was suggested that regional benefits could have been collected and shared regularly from the start of the implementation period to support refinement of plans as required and ensure additional buy-in from senior stakeholders.

3.6.3 Where there any cohorts of care homes or care home residents that required a different approach to engagement and support?

Care homes that had a good relationship with their GPs tended to be more engaged and involved in the project and had better uptake. The uptake of remote monitoring varied across London with respect to the different type of care homes. Some ICSs suggested that residential and care homes for people with learning disabilities showed a greater interest than nursing homes; and felt that this may be because these homes generally tend to report they do not receive sufficient clinical support. The ability to do remote monitoring felt like an "in-road" toward getting more clinical support for these homes so they felt more equipped to look after their residents:

"In terms of connecting that [readings from the system] to their GPs and needing any assurances, residential homes would get more value out of that as they won't have previously been trained necessarily in taking these types of readings that we are getting through the system and also, they are not readily available to quantify the concerns they have about their residents in the same way that trained nurses are."

However, other ICS staff said in the interviews that care homes for people with learning disabilities or mental health illnesses were more likely to only do ad hoc measurements rather than scheduled monitoring and since the staff were not clinically trained, they were less likely to see a benefit.

Regarding residential/nursing homes for older people, some ICSs saw quicker adoption by staff than other types of homes, while others reported some resistance from staff as they felt they were duplicating tasks, especially in larger care homes where they already have systems in place to capture some of the measurements.

It was agreed by all ICS leads that the homes already have a number of systems in place and introducing (another) digital system can add even more steps than the current system (including paper). It was felt that the technology should integrate into the existing care planning systems to ensure its use is streamlined.

3.6.4 What external factors need to be considered when understanding the progress and success of the London Innovation Collaborative?

The programme of work was delivered during the Covid-19 pandemic, and the subsequent vaccination programme often made engagement difficult as the care home staff and GPs were very busy delivering this as well as usual care.

However, some ICSs noted that the pandemic strengthened the relationship with the care homes as the wider support offered improved trust in the ICS programme team. The time pressures from the funders to procure and scale meant many ICSs did not feel they were able to fully engage with all relevant stakeholders, recruit the relevant delivery teams and ensure they were asking all the right questions to suppliers.

Some respondents reported that the approach was system-driven rather than being an opportunity to design the preferred pathway with healthcare professionals and then selecting the technology that best suited the area. Overall it felt rushed.

It was suggested that a slower pace, with a development phase followed by an implementation phase would have supported local delivery better, for example by avoiding i) the situation where care homes and GPs were recruited onto the technology at the same time and ii) where roll-out took place while the offer was still being developed.

"Because of the pressure to get it all out and the delays because of procurement, we literally went for it with all our care homes, and we developed our support offer and resources whilst rolling out and I think if I look back on that, I would do that in a more planned way with a smaller cohort over six months."

"The time that we had for procurement was really, really short. In an ideal world, end to end procurement takes 10-12

Interviewees said that staff turnover in care homes is high and this made training and utilisation more difficult to implement. In addition, the delays in confirming the later phases of the programme and the lack of clarity on contract extensions resulted in the loss of some key staff within some delivery teams.

3.6.5 What wider factors are essential in sustainability for this programme of work?

It was reported that it was essential to have a longer-term project plan (ideally from the start) including sustainability approaches (in particular with respect to funding) and a clear exit strategy to prevent changing pathways along the way.

The engagement of all stakeholders was identified as a priority and it was suggested that more support should be built into programmes of work to include:

- Time and resource for embedding to ensure ongoing use of technology following training, onboarding and implementation, both from an engagement and troubleshooting perspective.
- Dedicated resource to continue outreach to new care homes and GP practices.
- Improved learning and development support and funding. Virtual training is challenging to scale but essential for efficient delivery, and this can be improved with wider support (region wide training, and the development of easy-to-share video content)

> *"To keep it sustainable, you need to have the workforce to be able to build up relationships - whether its care homes, GPs, and the bigger system. You have to keep taking the bigger system with you, if you don't then it is going to fail. We all have got to see the benefits-from our local authority, clinical commissioning groups as they all come together and merge, it is key that you are in those meetings and telling and updating them about what is happening so this can drive forward...as we have started to get in those key meetings, that's when things have opened up."*

Where there was not a clear service agreement between all parties, some teams suggested that having this in place would have been beneficial.

It was also seen as important for the wider system (e.g. local authorities) to recognise and support the programme, some ICS leads felt that eventually the locality leads would have the ownership of the project.

Buy-in and support from organisations such as the Care Association, starting from the launch of the programme, would support conversations with care homes.

Suggestion was made by one of the ICSs that inclusion of remote monitoring in the CQC regulatory requirements for both primary care and care homes would ensure a better uptake and embedding of the technology.

4. Conclusions

This evaluation aimed to better understand the usage and potential impact of remote monitoring technology in care homes across four Integrated Care Systems in London and to generate insights to help commissioners and delivery teams design and deliver digital tools in the care home sector in the future. Each ICS adopted a different product(s) and implementation model.

Was the technology used when implemented?

The technology was well adopted and successfully embedded. A total of 173 care homes went "operationally live", which was defined as care homes that were using remote monitoring technology to conduct assessments at least once a month on average between the month of their first care home resident assessment and December 2021. Of these 173 care homes, **73.4%** (127) care homes were still using remote monitoring in December 2021.

We reported the number of observations taken per month per home, however this data needs to be interpreted with some caution. Lower levels of observations/assessments may not mean the products were not being utilised, as in some settings clinical agreement was reached that care homes or residents did not need regular observation monitoring, but that the technology was to be used when a resident appeared to be unwell/carers were concerned that their physical health was deteriorating.

Did care home staff perceive benefits?

Overall, staff saw several benefits of the technology, but reported mixed views regarding some elements.

A total of 108 members of staff working in care homes responded to a post-implementation survey seeking their views. The majority of the staff reported that remote monitoring had benefitted staff, residents and the wider healthcare system and that it improved communications and relationships between care home staff, primary care and urgent/emergency services.

A case study[9] undertaken by North Central London ICS further demonstrates the benefits of remote monitoring for residents and care home staff.

Views were mixed regarding the way in which remote monitoring changed the way staff cared for residents. While a few felt that it made it easier for staff to monitor and track changes and trends in residents' health, others felt it increased overall workload and that GPs did not always act fast enough in response to the observations taken.

Did care home staff feel confident using the technology?

The majority of care home staff who responded to the survey exploring their experience of remote monitoring said that they felt confident to use the technology in their care homes. Furthermore, the training was generally well received by care home staff, who found it useful.

Did GPs see benefits?

All GPs that responded (11) to the survey agreed that they would recommend that other care homes take up the use of remote monitoring solutions to care for residents. Seven out of 11 GPs felt that remote monitoring information had helped them to care for residents and that it improved the delivery of healthcare for residents.

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[9] Supporting residents and empowering staff: the impact of remote monitoring technology in care homes - YouTube

However, views were quite mixed regarding whether remote monitoring resulted in more appropriate use of wider healthcare services and if it improved the quality of communication with care home staff.

In a separate piece of work undertaken by North Central London ICS, it was highlighted that remote monitoring led to an increase in workload for GPs. Although there were limitations with the data, GP practices using remote monitoring had a greater increase in telephone/video consultations and face to face consultations (8.1% vs -9.7% and 22.5% vs 3.4% respectively) compared to those not using remote monitoring in the three months from April to June 2021. More information can be found in the presentation attached in Appendix A.

Did the use of remote monitoring technology impact healthcare utilisation?

Ambulance data and emergency hospital activity was compared between homes with and without remote monitoring. The results varied significantly, and we have been unable to identify a clear pattern to draw meaningful conclusions. For ambulance data, an additional summary of the data showing all ICSs is shown in Appendix D.

It is suggested that this evaluation was undertaken too soon after the implementation of the technology to be able to determine any impact on healthcare utilisation, and it is recommended that subsequent studies explore this further.

A study by NCL ICS compared change in London Ambulance Service utilisation by care homes for a six-month period before remote monitoring (April – November 2019) implementation to the same time period in 2021 after implementation of remote monitoring. Fifty-four care homes using remote monitoring reported a 28% reduction in LAS call outs compared to 14% reduction for 93 care homes without remote monitoring. For more information, see slide four in the presentation attached as Appendix B.

What factors are essential to make the model effective to enable greater spread and adoption?

Interviews with each of the ICS delivery teams highlighted the importance of:

- early engagement with the full range of stakeholders;
- support for care homes from dedicated outreach staff;
- readily available technology appropriate to the needs of care homes; and,
- clear implementation plans with reasonable timelines.

These findings are consistent with another evaluation carried out by NCL ICS which explored barriers and enablers to successful implementation of remote monitoring in care homes[10].

A case study describing the approach taken to the implementation of remote monitoring in care homes in south west London demonstrated the importance of dedicated support teams for successful implementation. More information can be found in Appendix C.

All teams also acknowledged the difficulty around delivering this programme during the pandemic alongside the vaccination drive that took place in care homes at the same time. Reference was also made to the increased demands placed on care home staff from Covid restrictions which meant care home staff often lacked the physical support of external colleagues and family members.

This report is published later than originally planned due to changes to the report format agreed between the commissioner and the HIN. The data collection period for this report concluded in December 2021, and we acknowledge that stakeholder perspectives with regard to remote monitoring in care homes may have moved on.

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[10] Primary-care-engagement-with-remote-monitoring-in-North-Central-London-FINAL.pdf (uclpartners.com)

5. Limitations

While this report sets out to answer a series of questions related to the implementation of remote monitoring in care homes across four London Integrated Care Systems, using available data, it must be noted that there were a number of limitations to the way this evaluation was conducted, as described below.

More data is needed to have a more detailed understanding of the individual models deployed within each ICS. During the evaluation period, adaptations were made to the models deployed and there was some variation in how different GP practices and care homes were using the same remote monitoring solutions. These factors were hard to control for. More work would be needed to collect quantitative and qualitative data at a care home level to understand if different approaches were leading to different remote monitoring utilisation rates and impacting on wider healthcare utilisation.

The utilisation data collected for each product differed and was provided at a monthly aggregated level. For providers that used a monthly unit of the number of unique resident assessments it was not possible to understand the full picture of the number of assessments being conducted.

The survey for care home and GP practice staff was disseminated via the ICS teams themselves and it was not possible to obtain a response rate or understand whether the staff members that responded were representative of the view of care home/GP practice staff in general. When split by ICS, the number of survey respondents was low and therefore the analysis has been reported in numbers rather than proportions of staff to ensure that messages are not misleading. Due to the small numbers, the analysis may not be robust and reliable and if the survey is repeated it could portray a different picture.

The original methodology included a pre remote monitoring implementation survey as well as a post implementation survey for care home staff. The intention had been to ask the same questions and track differences in views. During analysis, the numbers became too small when matching care homes that had responded to both pre and post implementation surveys, so the analysis included in this report is solely based on the post implementation survey.

London Ambulance Service (LAS) data regarding care home activity was routinely provided but was limited to what was available in its "care home report". It is important to highlight that the LAS data does not differentiate between resident and non-resident in the care home report, so a staff member, relative, passer-by etc. could have used the service. Furthermore, it was only possible to match some of the care homes that had implemented remote monitoring to the LAS care home report - not all care homes were included in the LAS data and some care homes did not have data for both the pre and post implementation periods. For this reason, a smaller cohort of care homes was used for this analysis.

The SUS (hospital data) was only provided by three of the four ICSs being evaluated. Identifying care home residents within SUS data can be challenging and a level of error will always be within the data as most ICS Business Intelligence teams use the postcode of patients being seen in hospital as a proxy for being a care home resident and individual postcodes include a number of addresses in very close proximity to the care home itself. In addition, as with the LAS data only some care homes that implemented remote monitoring were included within the SUS dataset.

The absence of any clear conclusions regarding the impact on healthcare service utilisation did not allow for a benefits realisation to be completed which would have provided the system with a strong message around the impact of the use of remote monitoring technology in the care homes. Moreover, it is difficult to wholly attribute any changes in the healthcare utilisation data to remote monitoring, especially as the post pilot implementation data was collected through the pandemic which may have skewed that data. It should also be noted that out of hours GP services did not typically have access to the remote monitoring observation results.

This evaluation focuses reporting at a care home level. In order to understand resident outcomes, data would need to be obtained and linked at a care home resident level.

For some ICSs there have been some quite big changes in the utilisation of wider healthcare services (hospital and ambulance) when comparing the group of care homes with remote monitoring to those without. Whilst work was done to measure whether the differences between the two groups of care homes were statistically significant, due to the data being provided at a care home level it was not possible to prove statistical significance as the number of data points at a care home level were too small (the more data points you have the easier it is to infer statistical significance). It is highly likely that if the data had been provided at a patient level then the larger differences in changes between the two groups would have been found to be statistically significant.

6. Recommendations

The following recommendations are made from the analysis of remote monitoring usage, the surveys of care home staff and GPs, from the healthcare utilisation data, and the interviews with lead staff from the four London ICSs. These are intended as a starting point for discussion and reflection and are likely to be of interest to a wide range of stakeholders.

Overall, the evaluation found that care home staff and GPs perceived remote monitoring to be beneficial in caring for their residents.
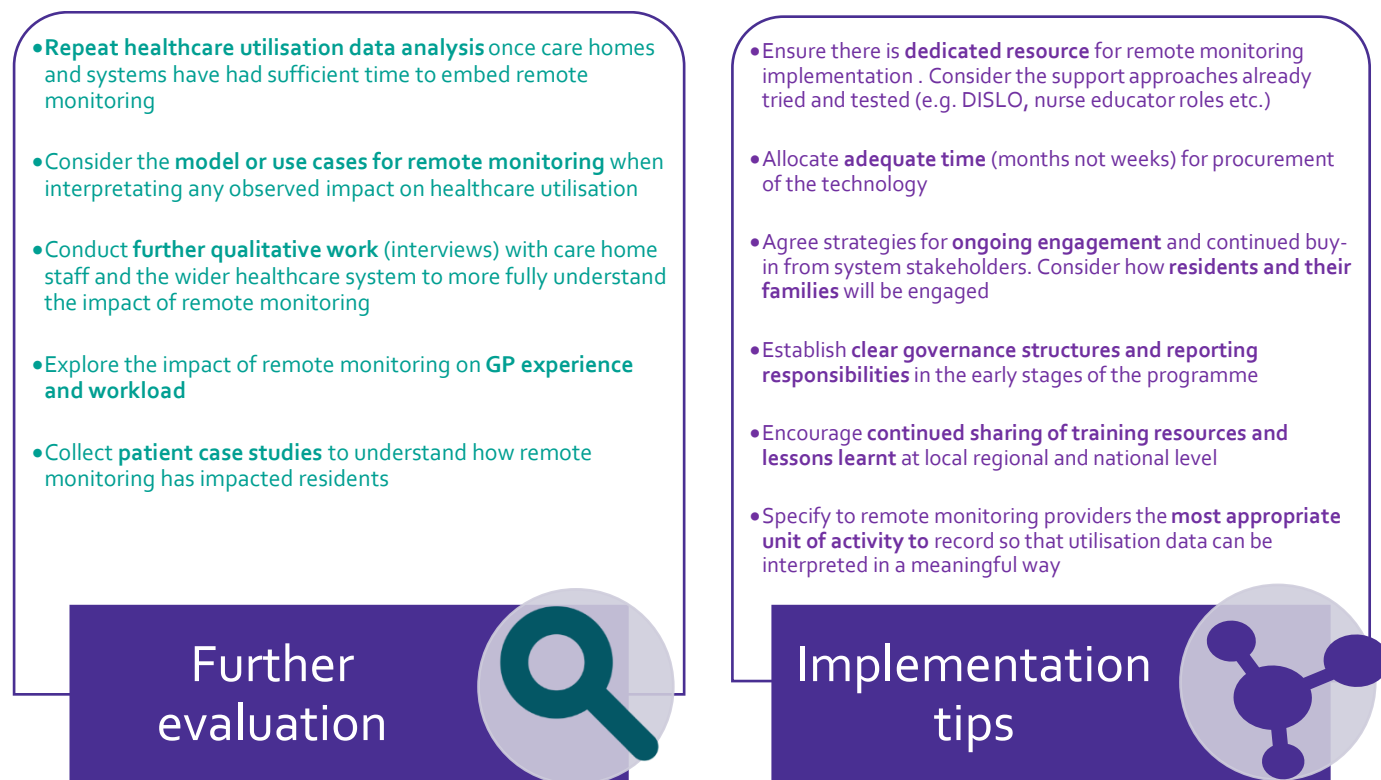
When considering further scale-up, we recommend the following:

- Continue to implement remote monitoring in care homes in London and undertake further analysis of healthcare utilisation data in 12 months to better understand the impact and allow for accurate return on investment calculations.

- Where any further evaluation takes place, ensure there is an agreed and understood model of use for remote monitoring in care homes to allow for a better understanding of the impact of the technology on healthcare utilisation.

- Undertake further qualitative work (interviews) with care homes and the wider healthcare system to more fully understand the impact of remote monitoring.

- Explore further the impact of remote monitoring on GP experience and workload, as well as on the experience of care home staff. Moreover, patient case studies should be collected to understand how remote monitoring has impacted residents.

- Ensure dedicated resource and an implementation plan is agreed by local stakeholders where any Integrated Care Systems plan to implement remote monitoring in care homes. This will maximise the potential for effective implementation and sustainability of the technology. Systems should consider the different support approaches already tried and tested (use of outreach staff such as DISLO, nurse educator etc.) and agree an appropriate approach for their area.

- Allocate an adequate amount of time (months not weeks) for procurement of technology.

- Specify to remote monitoring suppliers the most appropriate unit of activity to be recorded (suggested as number of individual assessments undertaken) to ensure data on utilisation can be monitored in a meaningful way.

- Commit to ongoing engagement to ensure continued buy-in from system stakeholders. This should also consider how residents and their families will be engaged.

- Articulate clear reporting responsibilities where there is both regional and national interest in a programme of work, with clear governance and reporting process put in place in the early stages of the programme.

- Encourage continued sharing of training resources and lessons learnt among different ICS and teams, locally, regionally and nationally.

  Attention is drawn to the separate studies undertaken to explore the implementation of remote monitoring in care homes in North Central London and South West London Integrated Care Systems, referenced in the

conclusion (YouTube videos) and appendix.

Figure 31: Overview of recommendations

Further evaluation

- **Repeat healthcare utilisation data analysis** once care homes and systems have had sufficient time to embed remote monitoring

- Consider the **model or use cases for remote monitoring** when interpretating any observed impact on healthcare utilisation

- Conduct **further qualitative work** (interviews) with care home staff and the wider healthcare system to more fully understand the impact of remote monitoring

- Explore the impact of remote monitoring on **GP experience and workload**

- Collect **patient case studies** to understand how remote monitoring has impacted residents

Implementation tips

- Ensure there is **dedicated resource** for remote monitoring implementation . Consider the support approaches already tried and tested (e.g. DISLO, nurse educator roles etc.)

- Allocate **adequate time** (months not weeks) for procurement of the technology

- Agree strategies for **ongoing engagement** and continued buy-in from system stakeholders. Consider how **residents and their families** will be engaged

- Establish **clear governance structures and reporting responsibilities** in the early stages of the programme

- Encourage **continued sharing of training resources and lessons learnt** at local regional and national level

- Specify to remote monitoring providers the **most appropriate unit of activity to** record so that utilisation data can be interpreted in a meaningful way

Appendices

Appendix A

Impact of Remote Monitoring in Care Homes on GP workload:
Data analysis undertaken by North Central London Integrated Care System

https://healthinnovationnetwork.com/wp-content/uploads/2023/04/To-share-NCL-impact-of-remote-monitoring-on-GP-workload.pptx

Appendix B

Outcomes of use of Remote Monitoring in Care Homes:
Summary from North Central London Integrated Care System

https://healthinnovationnetwork.com/wp-content/uploads/2023/04/NCL-EMT-Presentation-Nov-22.pptx

Appendix C

Experience of implementing Remote Monitoring in Care Homes in South West London

https://healthinnovationnetwork.com/report/experience-of-implementing-remote-monitoring-in-care-homes-in-south-west-london/

Comparison of ambulance utilisation by Care Homes, pre and post remote monitoring, by ICS

% of incidents conveyed pre and post remote monitoring implementation for care homes that implemented and did not implement remote monitoring

	NCL		NEL		SEL		SWL	
	Remote Monitoring	No remote Monitoring	Remote Monitoring	No remote Monitoring	Remote Monitoring	No remote Monitoring	Remote Monitoring	No remote Monitoring
Pre	85%	78%	86%	84%	82%	83%	83%	81%
Post	79%	73%	79%	71%	75%	75%	78%	77%
Change	-6%	-5%	-7%	-13%	-7%	-8%	-5%	-4%
% Change	-7.18%	-6.47%	-7.70%	-16.00%	-8.85%	-9.14%	-5.44%	-5.03%