Health & Social Care: Care Home Phase 2 Project: Q1-Q4 2022

End of Project Report

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1. SCOPE OF REPORT

This is the project closure report required by DCMS for the Health & Social Care: Care Home Phase 2 Project: Q1-Q4 2022. The report will detail impact of work to date and next steps. The closure report includes an evaluation report with feedback from GP's, care homes and any results from NHS health economies.

2. Executive Summary

2.1. On this project, delays relating to 5G access and to unexpected governance challenges from the NHS meant that the programme of work started months later than originally planned. This has meant very limited results were available by 31 March 2022, the closure date for this report. To compensate for this, data will continue to be collected until 30 June 2022, a further three months beyond the date of this closure report.

2.2. The main purpose of this report is to highlight the results to date from trialling 5G-enabled remote diagnostics in several care homes that hold a weekly GP consultation round. The aim is to trial holding those ward rounds based on the use of the Tekihealth remote monitoring suite which can also be used for ad hoc and emergency consultations.

2.3. The testing so far of 5G has found that the lack of spread of masts and the frequencies being used which hamper building penetration, has resulted in less than promising results in using 5G in this project.

2.4. A key expected benefit of having improved connectivity was reduction in unnecessary ambulance callouts and hospital referrals. To date though, care homes are not using the Tekihealth equipment for this purpose and the main usage remains on remote ward rounds in partnership with GP practices. Homes are being encouraged to make more use of the solution for ad hoc requirements.

2.5. The severe delays in starting the project activities relating to provision of SIMS and routers for care homes has led to a very important lesson learned - it is inappropriate to rely on 'goodwill' provision, only funded services make sense. Specifically here, our partner MNO had offered to provide all SIMS and Routers, and supporting consultancy, free of charge, but they underestimated the demands and challenges and we had no contingency budget allocated.

3. Introduction

This project aimed to demonstrate the value of 5G in supporting remote diagnosis applications in care homes and to do so at sufficient scale and duration to underpin sustainable adoption by the NHS and other care providers.

This project is the second phase of a programme of work funded through WM5G.

For the phase 1 **care home project** remote diagnostic solutions were placed into five care homes – with care home and associated GP practice staff fully trained to use the systems which by the end of November 2020 were in full operational use. A primary driver for this project was of course Covid-19 with the need to protect care home patients, and staff in GP practices and in the care homes, from infection. However, the benefits are sustainable

long-term – Covid aside, it is both dangerous and expensive to admit care home patients to hospital unless absolutely necessary. Providing remote diagnostic capability at the patient end is the key to addressing this challenge.

The reaction from all stakeholders involved in the phase 1 was exceptionally positive – in terms of the usability, practicality, impact of the solution. Patients, care home staff and GP staff could all see the potential positive impact and had ample opportunity to see why the reliability and speed of 5G boosted the potential.

Unfortunately, even though Vodafone liaised on which locations were likely to be 5G-enabled in a timely manner, none of the original five care homes were able to access Vodafone 5G infrastructure by the conclusion of the first phase of work. Although fixed infrastructure might seem the default choice in these urban environments some of the care homes had poor connectivity and the project supplied 4G solutions. There were some connectivity issues for these homes which impacted the efficacy of the pilot. Although homes could connect via 4G this was sometimes right at the limit for the use case – there can be interruptions mid-consultation for example.

This second phase planned to address this issue by providing 5G to these existing care homes but extend out to around 10 care homes. The aim remained to make a comparison with and without 5G and certainly all participants are as keen as WM5G is to see the enhanced performance 5G will undoubtedly bring – allowing multi-disciplinary team access, reducing latency during consultations and minimising the likelihood of interruption.

Specific aims and objectives

We had specific overarching objectives for the current project, building on Phase1:

- Move to a more substantive care home trial in two/three local geographies areas – Coventry, Birmingham and Wolverhampton – providing pathway integration for the Tekihealth solution where needed into remote tracking solutions which complement real-time diagnosis.
- Make a substantial step-forward in quantifying and documenting the benefits of the 5G-enabled solution and supporting commercial deployment. These benefits include:
    - Reductions to unnecessary referral to hospital
    - Reductions in ambulance callouts
    - Increased use of remote, virtual ward rounds rather than face to face visits
    - Reduced ad-hoc visits to care homes by GP staff

- These benefits were agreed in advance with the participating stakeholders not only because they are the critical system-benefits we would want to see but because it was also possible to baseline these as recorded in the BR sheet.

4. Description of the results to date

4.1. During the project it was ascertained that the DCMS budget would only allow us to procure sufficient Tekihealth licences to support 8 care homes in the programme instead of the original ten expected.

4.2. It was also ascertained that only 7 of the possible 8 sites identified were within a 5G enabled geography.

4.3. Due to world shortages of 5G chips needed for routers the project was faced with substantial delays in getting the connectivity set up in the care homes.

4.4. Due to length of time from initial engagement to trying to get the pilot set up one of the 8 sites opted out of the pilot in the last quarter of the project bringing us down to 6 sites.

4.5. The remote diagnostics kits were delivered to all sites from June to September 2021 but due to connectivity issues only two sites used the technology with their existing 4G connectivity solution. Only one site, St Josephs, collected any useful data during this period.

4.6. Substantial information governance and data protection governance issues arose which have resulted in the product that had been procured by WM5G not to be approved by the IT Assurance framework in Birmingham and Solihull which was to host 6 of the sites for this test case.

4.7. It has not been possible, owing to the timing and scale of rollouts constrained both by governance and connectivity limitations, to sensibly test the impact of the solution on the key intended benefits. As a result of the ongoing connectivity issues we were unable to conduct the trial as planned for all but one of the sites (St Joesphs). We have therefore only included the data for St Jospehs in use case 1, which aimed to reduce emergency hospital admissions.
Another limitation of the planned trial was the reduction of Covid-related restrictions during the trial period, which meant GPs had less incentive to use the diagnostic kit remotely. More face to face visits were made when restrictions were lifted, and savings on travel times and mileage from the practices to the care home therefore seems insignificant. Ultimately the pre-trial period cannot provide a good baseline for this trial.

To date testing of 5G connectivity has given us the following results:

- St. Josephs has reported that 5G connectivity has not improved their connection and will continue to use the care homes Wi-Fi.
- Oaks care home has ‘better’ (more reliable, better speeds) 4G than 5G connectivity.
- Alexander has reported that they can use the Tekihealth solution with 5G but as you can see from the table below the upload speed is better on their existing 4G connection.
- Perry Trees connectivity is not enough on 4G or 5G for them to take advantage of the solution so will no longer be part of the pilot.

Table 1: Upload and download speed comparisons for the participating care homes (Single day tests, February 2022)

Care home	4G		5G	
	Download	**Upload**	**Download**	**Upload**
St Josephs	41.5.	9.78.	No response yet	
Oaks	54	18	15	1.96
Star & Garter	Withdrawn			
Alexandra	42.5	14.4	128	1.53
Metchly	58.7	57.4	Sim not found	Sim not found
Olivet	28.2	42.5	105	88
Perry Trees	No stable connection to test	No stable connection to test	15	0.03
EHCH	Waiting for SIM card			

5. Impact of the results including Benefits (in line with BR sheets – include KPI dashboard)

The main, and disappointing, finding of testing 5G signals at the care homes has been that 5G is not widely accessible in most areas where we expected it to be working. This expectation was based on the advice and guidance of network operators and WM5G's own review of mast locations.

Due to higher / frequency bands used for 5G, although there are sites (care homes) with masts within 500 metres, there is still failure to get a sustainable indoor signal in many of the care homes. Technical advisers from WM5G and Vodafone have now said that this project was a few years ahead of the connectivity being available as expected.

From a 5G perspective the feedback from the care home is that even though 5G is available it is not consistent and they are having to go back to their care home 4G connection as that often provides a better signal. The solution can work over 4G but previous phases of the pilot had demonstrated a lack of consistent robustness which it had been hoped 5G would rectify.

Tekihealth consultations between 21/10/2021 and 22/03/2022

As outlined above, delays mean very limited usage by the time of this report. The consultation usage thus far is based on usage over a trial period of five months at just one of the care homes (St Josephs) and is as follows:

- 1 Tekihealth consultation in October 2021 for a duration of 8 mins performing the following health checks: Heart Rate
- 6 Tekihealth consultations in December 2021 for an average 7.5 mins (with 1 Tekihealth consultation excluded as an outlier since it appears to have lasted 72mins

which suggests perhaps a connection left open rather than a genuine consultation of this length) performing the following health checks; Temperature, Lungs, Throat, Ears, Skin, Heart Rate.

- 5 Tekihealth consultations in January 2022 for an average of 8.5 mins (with 1 Tekihealth consultation excluded as an outlier since it lasted 53 mins, excluded for the same reason as above) performing the following health checks; Lungs, Throat, Skin, heart
- 3 Tekihealth consultation in February 2022 for an average duration of 56 mins (with 1 Tekihealth consultation excluded as an outlier since it is reported as lasting 902 mins for unknown reasons, but again perhaps a call left open) performing the following health checks; Skin, Lungs.
- 3 Tekihealth consultations in March for an average duration of 43 mins performing the following health checks; Video & audio conferencing

We believe in total - that is 18 consultations conducted

Travel implications/savings (St Joseph's)

St Joseph's care home to Lordswood surgery – 0.7 mile (3 min) there and back 1.4 (6 min)

(this does not include other time factors that would be implicated such as getting the patient ready for transport and the admin required to do so)

Oct 21 – 1 Tekihealth consultations resulting in 1.4 miles saved and 6 mins in travel time.

Dec 21 – 6 Tekihealth consultations resulting in 8.4 miles saved and 36 mins in travel time.

Jan 22 – 5 Tekihealth consultations resulting in 7 miles saved and 30 min in travel time.

Feb 22 – 3 Tekihealth consultation resulting in 4.2 miles saved and 18 min in travel time.

March 22 – 3 Tekihealth consultations resulting in 2.8 miles saved and 12 min in travel time.

Total Mileage saved – 23.8 miles saved and 1 hour 42 mins saved in travel time.

It is worth noting that these consultations are part of GP weekly visits to care homes and they are not related to resident travel – residents are generally not mobile in these types of homes. Residents want rapid response to more ad hoc needs and if this is more readily achieved virtually rather than with live visits then this is a preferred route.

Customer satisfaction surveys At the end of each consultation an automated survey is generated enabling care home workers to engage with residents to complete. See appendix 1 for questionnaire.

Average across 10 surveys, rating 0-5 (where 0 is poor, 5 is excellent) and participants were asked how satisfied they were under the following headings:

- Tyto Diagnostics Ease of Use – 5
- Audio Quality – 4
- Image Quality – 3.8

Comments from GP and Care Home Staff

An interview was conducted with the GP and Care Home staff that work at St. Joseph's Care Home.

There was some very positive feedback given.

The GP said "equipment is amazing picture of looking into the ears, very clear pictures – good on heart sounds. Very impressed with the equipment"

The GP and care home confirmed that they have not used the kit for urgent appointments – as they had technical issues setting this up as there is not connectivity coverage throughout the care home even when trying to use 5G. "It buffers and loses signals when moving around the building and they have blind spots."

Patients were reported to happy to have the consultations this wat but some would prefer face to face. A few of the patients found it confusing as why the Dr was in the iPad and some found it difficult to understand what was happening but this was dealt with by the care home staff.

They reported when it worked the sound quality was very good and the quality of the picture / visuals was very good.

The GP was happy with all the diagnostics tools available and it provided them the results they needed in real time.

In a few cases where there was urgent / emergency need then there needed to be follow-up face to face consultations. There was one patient that required an abdominal examination which would not have been appropriate to do remotely. There was also a discussion required with a patient about instruction to Do Not Attempt Resuscitation (DNAR) and respect which could not be done over the video.

Feedback on set up and training from the care home was that it would have been good to have initial face to face setup and then it would be quicker to set up. They believe it "Need hands on experience to getting on set up."

GP commented that the Tekihealth service has helped the practice fulfil her service requirements to the care home and their contracted Direct Enhance Service requirements.

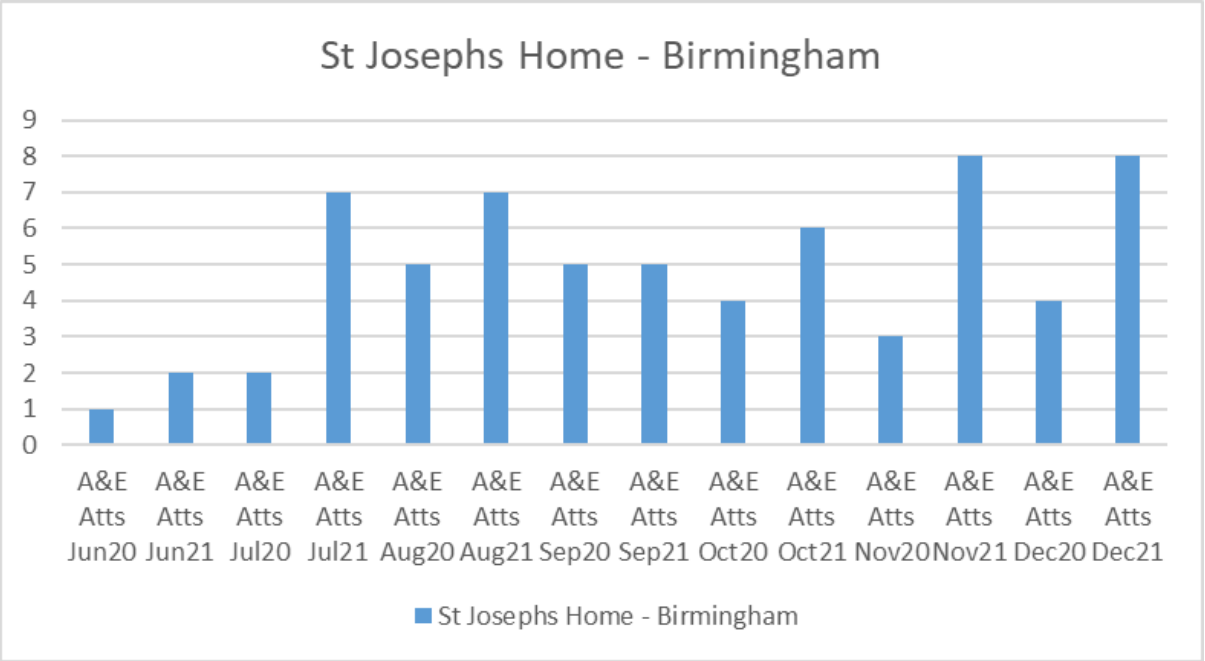
GP commented that "It saves some time for GP and the round-up goes faster when doing them remotely".

Accident and Emergency and Ambulance Call out Data

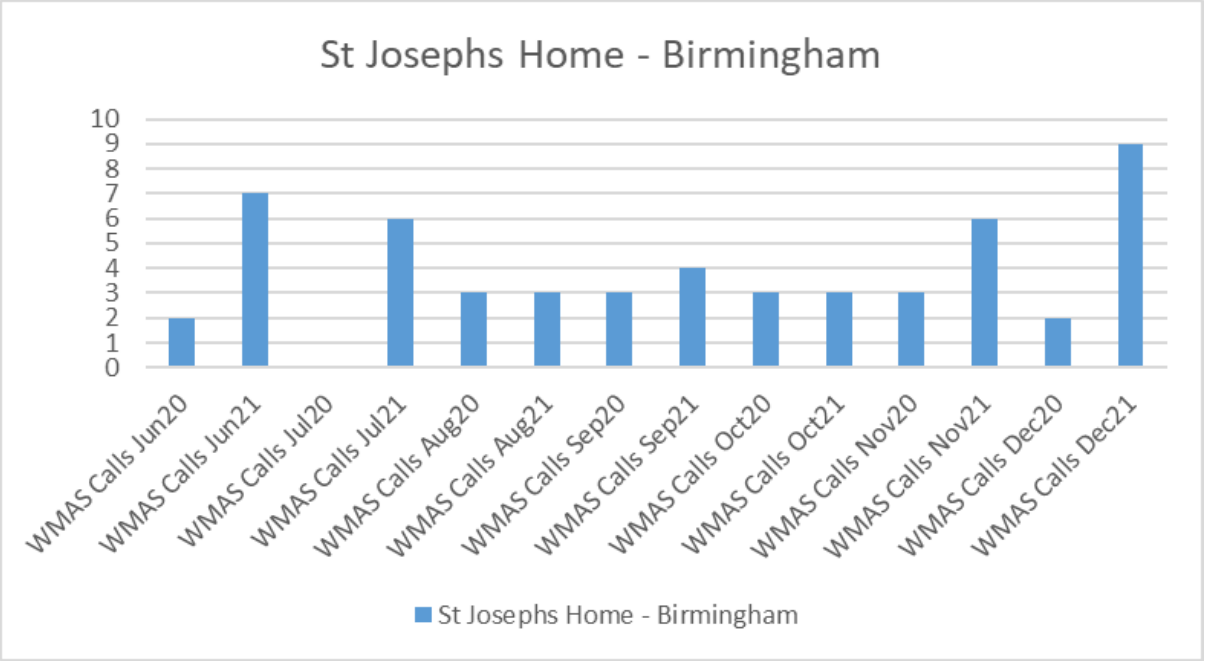
The project aimed to reduce A&E Admissions through use of the Tekihealth equipment to conduct remote consultations.

Equipment was up and running from October 2021 at St Josephs.

To date there is insufficient data available to provide any evidence of improvement in Accident & Emergency (A & E) attendances for these care homes from having the Tekihealth consultations in place. See comparison bar charts below from October 20 to Oct 21 onwards. We did ask the care home if the Tekihealth was being utilised for urgent appointments and they have said this has not taken place so the care they are providing is routine primary care consultations which will not impact on Accident and Emergency attendances or ambulance call outs.



Below is a chart comparing same month with each year. This again does not show any beneficial impact on West Midlands Ambulance call outs for use of the Tekihealth solution and technology.



At the remaining sites, we were not able to conduct the trial because of the issues outlined already around connectivity. These included Perry Trees Care Home (Birmingham) , Alexandra House Care Home (Birmingham), Sunrise Care Home of Edgbaston and Olivet Care Home.

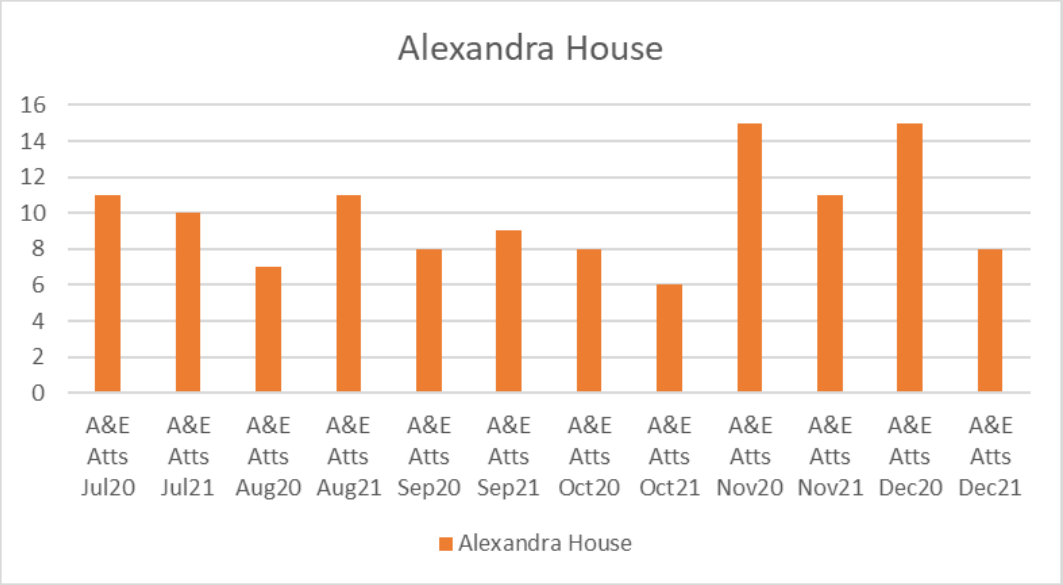
We have drawn together a summary of these issues for each care home below. We also chose to include data from these sites in the report - which could possibly used as comparator data in possible futures trials.

The Perry Trees Care Home in Birmingham had the kit delivered to them on 23-06-21. Their existing Wi-Fi system did not have the speed requirements to do the consultations using the Teki-hub kit. A 5G router was set up and it was found that even with the router places next to Window only gave 0.03 megabytes per second download speed whereas the minimum required for a consultation is 3 or 4 MB per second. As a result of this in Early March it was concluded that this care home could not participate in the pilot. The project ran out of time to consider any other connectivity solution that would be viable for this site.

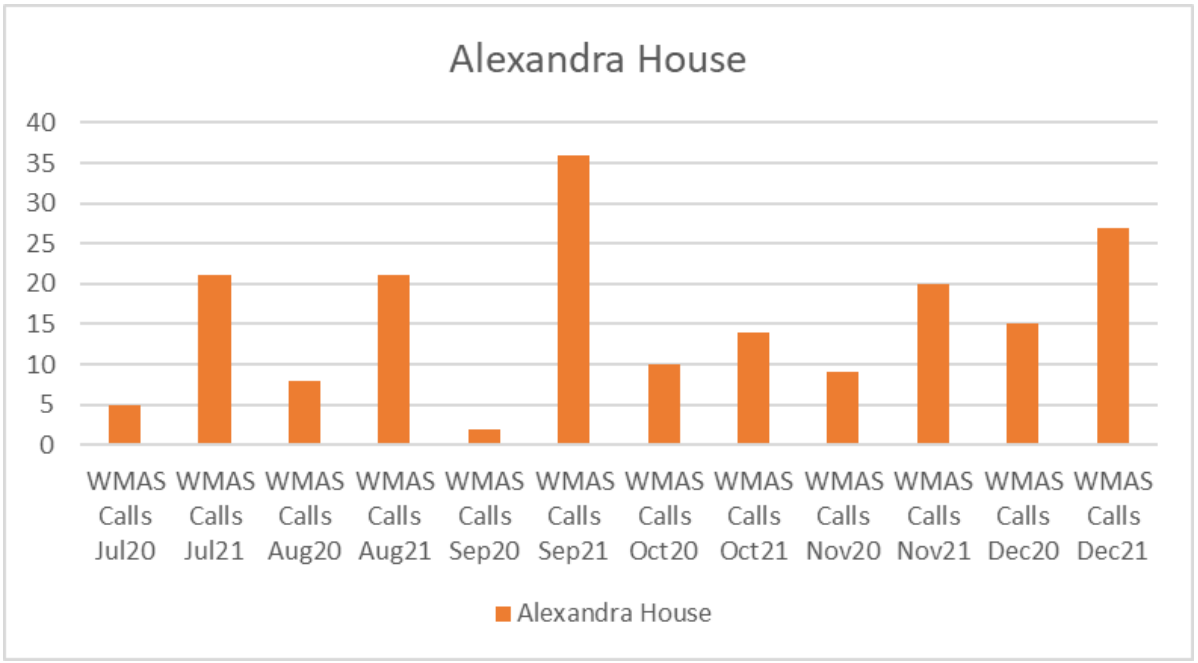
Alexandra Care Home in Birmingham had the kit delivered to them on 02-07-21.

As can be seen below in the comparison charts from July 2020 and July 2021 onwards there seems to be some reduction in A & E attendances. However, the numbers are so low that it would not be appropriate to apportion this reduction to Tekihealth consultations especially when there is no data showing usage of Tekihealth in those months.

Where care homes had access to the equipment but connectivity was sorted late, no data on usage could be added to this report. We added data from when they had access to the kit regardless of their ability to use it or, in some instances, not using it with their existing wifi connection.

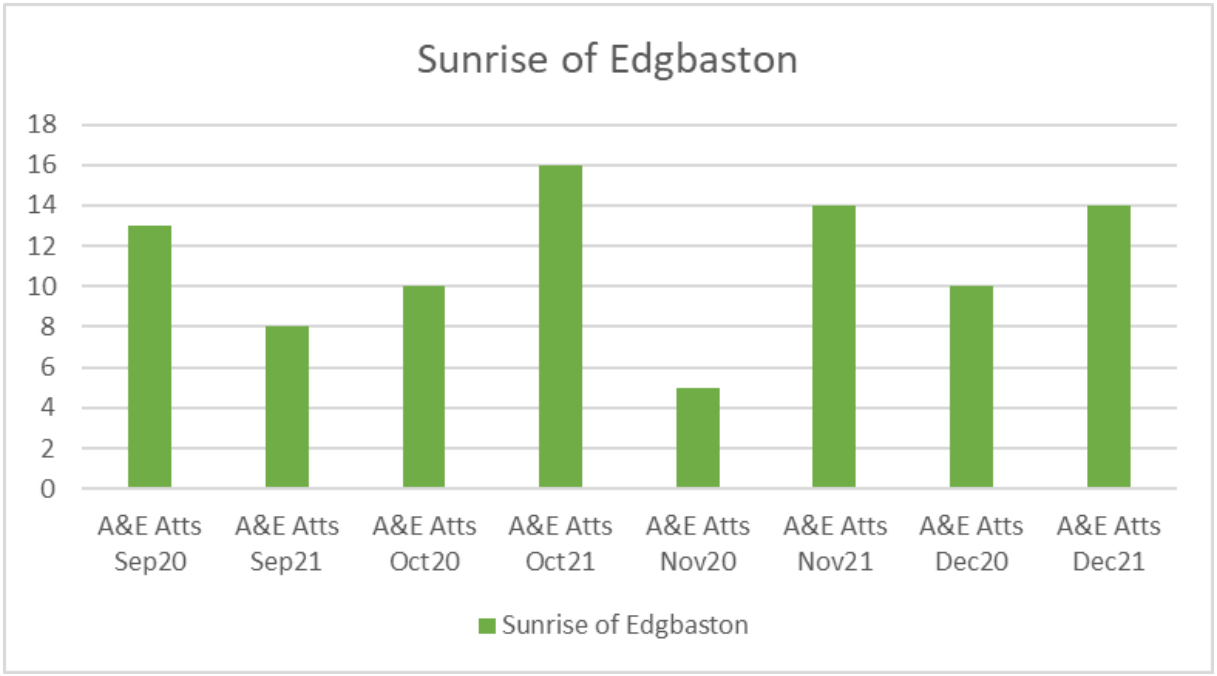


The data below does not show any improvements in number of ambulance call outs since the Tekihub kit was available to the care home to use.

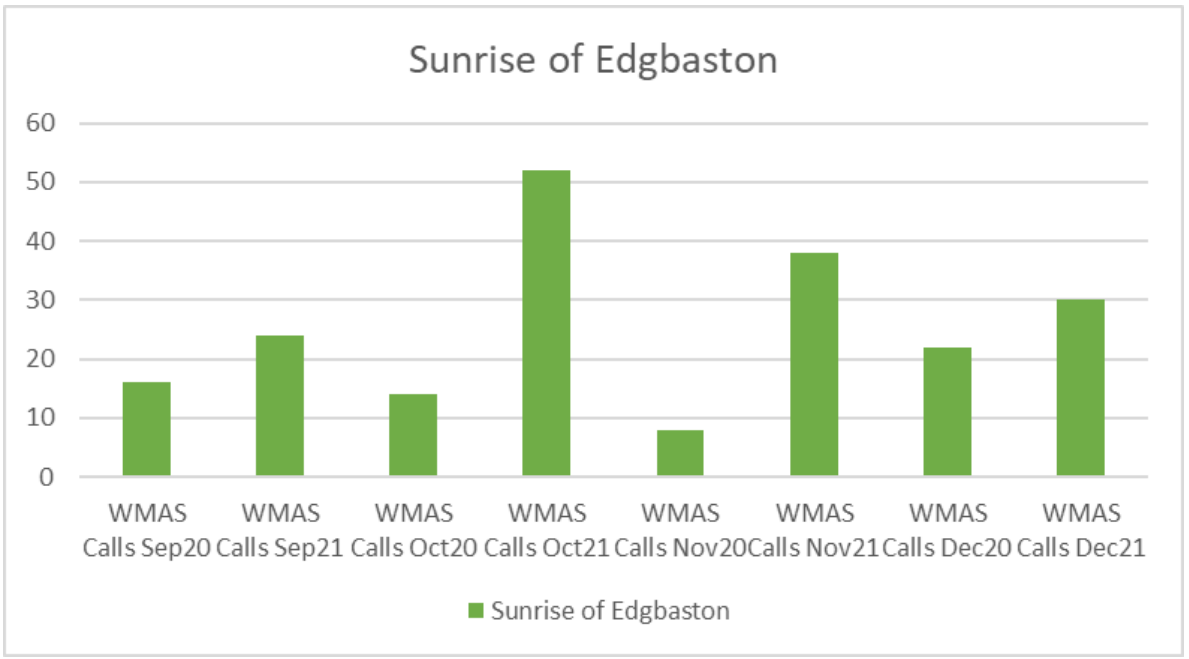


Royal Star & Garter Care Home in Solihull had the Tekihealth kit delivered to them on 15-07-21. The GP reported in February 2022 that they do not feel they need to use the kit and would prefer to go into the care home to carry out the consultations.

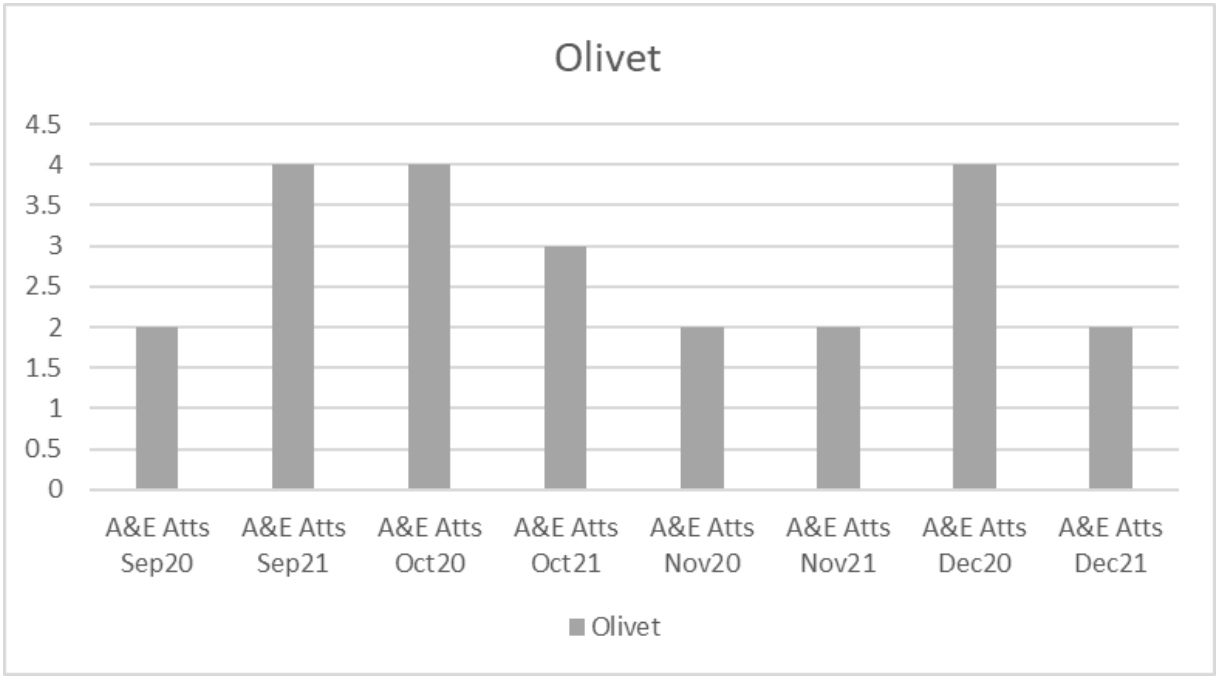
Metchley Manor previously known as Sunrise– Birmingham the kit was delivered on 21-09-21. The data does not show any improvements in A & E attendance from September 2021 compared to the previous year. See bar charts comparison below. Again on asking the care home on use the weekly ward round that it is intended to be used for is not an urgent care usage.



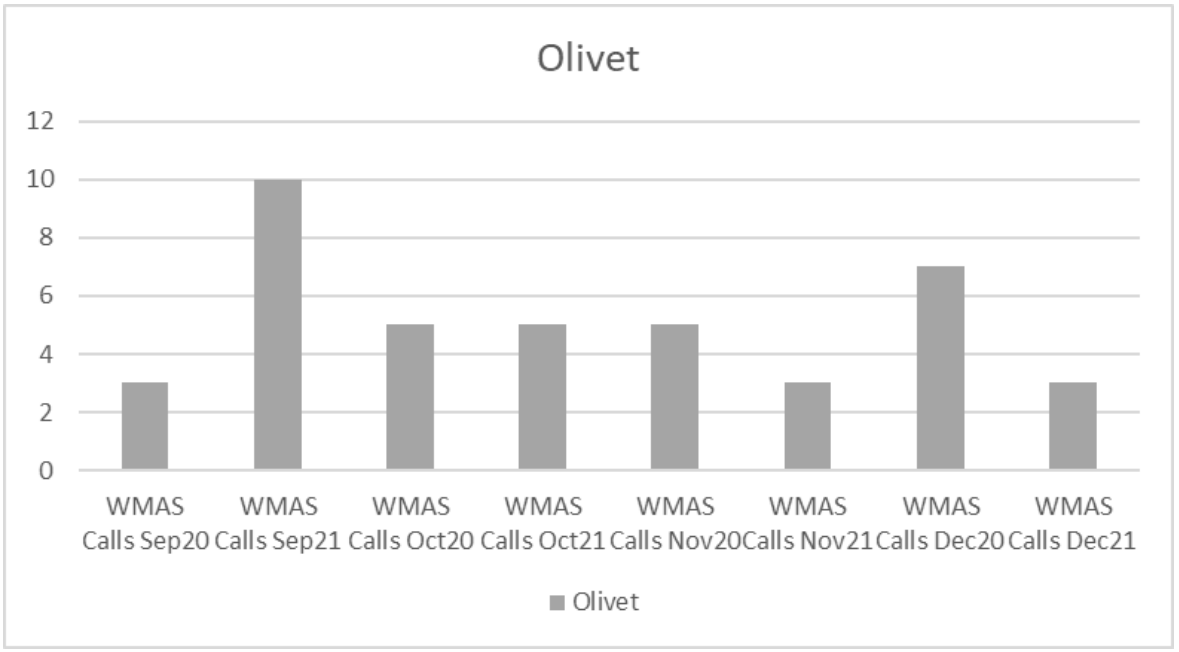
The chart below also shows no improvements in West Midlands Ambulance Calls from September onwards when the care home had access to use the kit.



Olivet Care Home in Birmingham had the kit delivered to them on 24-09-21. There seems to be an improvement in A & E attendances from the date the care home had access to the Tekihub kit as they have declined or stable numbers. However this maybe for other reasons as the kit was not used for urgent appointments.



The data below shows that no impact on Ambulance call outs from that date onwards. There is a minor dip in November 21 and December 21 compared to the previous year, however there is no data showing the kit was used in that month.



Oaks – 03-08-21

No data yet available.

Additional Technology Testing

As part of this project, we had in scope the testing of 10 remote humidity and environmental sensors deployed in 10 houses – that is, in ten residential homes, completely separate from the care home deployment. Frail and elderly patients were identified for this deployment and so at high risk of falls and related incidents. Trials commenced on 22nd Feb 2022 and equipment will be in place and providing data for one year. The selected equipment builds up a 'digital twin' of the resident as a behavioural baseline using solely humidity data – every tap, kettle, microwave usage for example contributing to this baseline which can be reliably established over 2-3 days.

Initial feedback from the Frailty Care Co-ordinating team has confirmed they are getting daily alerts and have supported residents with their needs, including a referral to fuel poverty.

Tekihealth has the additional service in their proposal which was to support remote monitoring in care homes that showed an interest. This service was to be subcontracted by Tekihealth to Dignio. It has been agreed that the remote monitoring service will monitor residents in Eden House that are showing signs of deterioration, using the Dignio platform. Results will be sent to the GP, and the care worker app to be used by care workers in the care home. Care home staff are to provide vital signs data and observations via questionnaires using the Dignio Care app and associated integrated Bluetooth enabled medical devices. The GP will monitor the dashboard and the resident history so that she can provide support and guidance to avoid further deterioration of the resident and hopefully avoid unnecessary hospital admissions.

There has been only one care home that expressed an interest and there have been some delays in setting this up.

- Date of first contact: 12th of July 2021 - contacted the care home manager, to ask to provide a demo. Date of virtual demo: 4th of August 2021.
- Date of follow up pathway discussion with the care home manager and GP : 25th of August 2021.
- Date of submission of the DPIA for Forum Health & Eden House to AGEM CSU IG Lead: 16th of September 2021.
- Date of signed Data Sharing Agreement received: 27th of September 2021.
- AGEM CSU DPO/IG Lead sign off of the DPIA: 14th of December 2021 - Eden House had not completed a recent DSPT (Data Security & Protection Toolkit), which delayed the process of sign-off.
- Attempts were made to visit the care home to deliver training to care home staff and the GP between 13 January 2022 to 7 March 2022, although so far not delivered.
- As described above there have been some issues around getting the DPIA signed off, and then some further challenges around arranging a time to deliver the training. Unfortunately, we don't have an agreed go-live date yet, as this is something that we normally agree upon following the training.

Although data is continuing to be collected there are no formal routes in place to share that data with DCMS.

Key lessons learned captured to date

- The time taken to get meetings with the key stakeholders was much longer than anticipated.
- Each care home and GP practice is an individual project and needs to be managed as such.
- Senior CCG, Care Home and PCN buy in is required to support and encourage both primary care and the care homes to engage with the project. This was not always there. The GPs and the Care homes are independent and could opt not to be involved, and this resulted in having to go to a number of sites before agreeing the final sites that this project was going to work with.
- There was no financial incentive for care homes or GPs to use the Tekihub kit. This was a free trial which they could opt in or out of. They were not paying for the service and would not have the resources to pay for it. In the future after sign up there needs to be possibly a financial penalty for not staying engaged.
- Funding / budget should have been in place or contingencies to put in place, for example, 4G or other connectivity solutions while the 5G connectivity was being sourced.
- Because of the delayed start to the project the SME, Tekihealth Ltd, has agreed to continue to monitor usage and impact of the solution in participating care homes. Arden & GEM CSU is no longer under contract as part of the programme and so feedback is reliant on the goodwill and commitment of the SME but this is as important to them - in testing the value of their offer - as it is to the trials and testbed programme. They have agreed to provide an update once the licences expire for this project on 30 June 2022, so a target date for this report is 14 July 2022 Also the governance and data protection issues that arose which have resulted in the product that had been procured by WM5G not to be approved by the IT Assurance framework in Birmingham and Solihull which was to host 6 of the sites for this test case.

6. Financial end of programme requirements

All claims are based upon collating and submitting the associated information/evidence to DCMS on a quarterly basis following the agreed financial principles between the respective parties i.e. DCMS and WM5G. Only when the evidence is approved, is the grant payment mad in the final quarter of delivery, all evidence associated with each program / project is shared with DCMS and further information upon request as supporting evidence.

7. State aid and spend compliance

From a state aid / subsidy control perspective, residual asset values are of significance primarily under Article 25 GBER, whereby residual asset values could have the potential

to create incompatible state aid. This would be in a scenario where the grant recipient claimed the full costs of the equipment/materials/land/buildings (as opposed to just an amount relating to the depreciation value over the life of the project – where that item is likely to have a use life/residual value at the end of the project) and the equipment is retained by the grant recipient at the end of the project. Under Article 26 the same provisions in relation to calculation of eligible costs based on depreciation values are not set out in the GBER Article. Therefore, the following outlines WM5G's compliance with the state aid approach and there are no outstanding legal challenges.

Workstream	Project Partner	State aid/subsidy exemption
Health	NHS Arden & Greater East Midlands CSU	Intra-state transfer
	Corporate Health Limited	Minimal financial assistance

Appendix 1

TELEMEDICINE PATIENT SATISFACTION SURVEY

Clinic date_____

Age: □0 – 20 □21 – 40 □41 – 60 □61 – 80 □80+

Sex: □Male □Female

How Satisfied were you with:	1 Very dissatisfied	2 Dissatisfied	3 Neither satisfied or dissatisfied	4 Satisfied	5 Very Satisfied	N/A Unable to get a response
Your overall treatment experience of using the telemedicine clinic?						