Evaluation of the 'Connecting Residents in Scotland's Care Homes' Programme.

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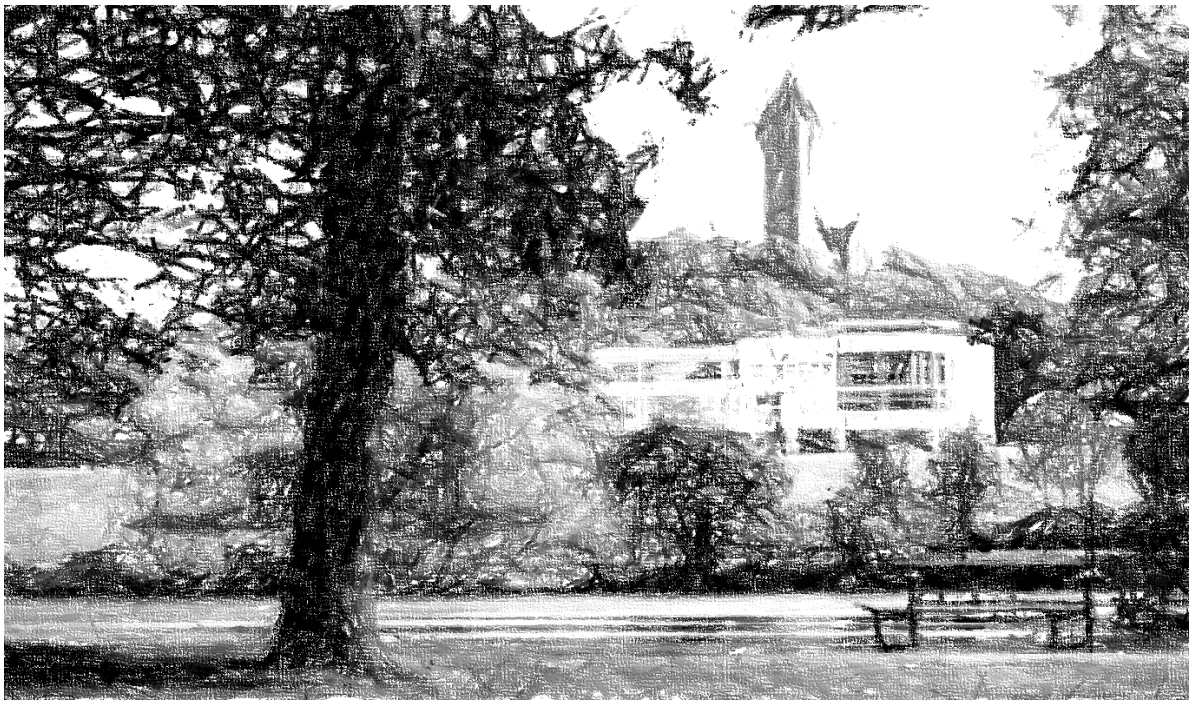

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1. Background and Project Aims

1.1 About the Evaluation

This report details the findings from the 'Connecting Residents in Scotland's Care Homes' (hereafter CRSCH) programme evaluation. The evaluation was commissioned by the Scottish Government Technology Enabled Care programme in conjunction with the Digital Health and Care Innovation Centre (DHI). The project looked to evaluate the programme from the perspectives of all stakeholders, including residents, care staff, managers, family and friends of residents, and policymakers. Our goal was to find how far the programme is meeting its goals, the issues influencing its effectiveness, and the individual and organisational factors that will influence its continued scale up and sustainability over the longer term. The evaluation was conducted between December 2021 and July 2022 by a research team from the Faculty of Social Sciences and the Stirling Management School at the University of Stirling.

1.2 Background to the programme

Nowhere have the challenges and consequences of the COVID-19 pandemic been felt more acutely than by care homes, their residents, and staff. The consequences of the pandemic for mortality and morbidity among care home residents, a population at acute risk from COVID-19, have been well documented, but a further well recognised consequence has been the long-term social isolation felt by residents because of prolonged social distancing measures (Wu 2020; Williams *et al.* 2021). In abruptly cutting off residents from friends and family, these measures have had profound, harmful effects on the physical, emotional, and cognitive health of care home residents, as well as on their quality of life and wellbeing. It is also important to note that for care homes, COVID-19 still is an acute and serious threat. While at the time of authoring this report (July 2022) almost all social distancing restrictions in Scotland have been lifted, within care homes many restrictions remain in place. As of Summer 2022, mask wearing, personal protective equipment and regular testing of residents and staff continue to be the norm, and Lateral Flow tests prior to entry by visitors are still required. Local outbreaks also mean care homes are frequently experiencing periods of closure or restrictions to the number or frequency of visitors. Although the pandemic may now seem 'over' for many people in Scotland and beyond, this is not the case within the care home sector.

Part of the 'Connecting Scotland' programme, the CRSCH programme was launched in November 2020 by the Scottish Government with the goal of equipping all care homes within Scotland with Apple iPads. Using video conferencing platforms available on iPad apps such as Teams, Zoom, Skype, Facetime or WhatsApp, residents could stay connected with friends and family during the second national lockdown in December 2020, and subsequent social distancing measures that remained in

place. The tablets also supported residents to maintain contact with formal health and care services such as through the 'Near Me/ 'Attend Anywhere' videoconferencing service or with other NHS appointments (e.g., GP consultations in primary care), which also shifted online during the pandemic. In addition to the provision of devices, the programme also provided online training to enable care home staff to become 'digital champions' who could promote the use of technology in their home.

The Scottish Council for Voluntary Organisations (SCVO) held responsibility for the delivery of the CRSCH. At the end of the programme, 75% of the 1325 registered care homes in Scotland (correct as September 2021) had been supplied with at least one iPad, and 115 care homes, which is 8.2% of the registered care homes, had been supplied with additional iPads following a second application process. Many of these homes (n=434) were also supplied with mobile MiFi routers, which enabled wireless access to the internet via the mobile phone network if a hard-line internet connection was not available, or of poor quality. COVID-19 has undoubtedly led to a rapid acceleration in the use of digital technologies within health and social care, with many such interventions now becoming increasingly embedded within care systems (Litchfield *et al.* 2021). The Near Me video consultation service is an exemplar of the embedding of such technology within mainstream service provision in Scotland (Wherton & Greenhalgh 2020).

Research has previously shown that care homes face both enablers and barriers to the uptake of technologies (Warmoth *et al.* 2022). Digital connectivity among care homes is often patchy, with many care homes lacking sufficient digital infrastructures (e.g., internet connections, devices or skills and training), staff and residents feeling discomfort with new media or ways of working, and a lack of planning for the adoption of technology within the care home setting. Such factors mean that during COVID-19, care home residents were at greater risk of both digital and social exclusion, with significant negative impacts on physical and mental health, and experience of loneliness and isolation (Seifert *et al.* 2021; Warmoth *et al*. 2022). The urgency of the situation resulted in many interventions, including CRSCH, being developed and implemented far more rapidly than is the norm for technology implementation projects in health and social care. There is therefore an acute need to evaluate these programmes to ensure that the lessons and learning generated from its rapid deployment can be shared across the care home and social care sectors.

Technology based programmes such as CRSCH should be understood as complex interventions. Their successful delivery will be determined by the interplay between stakeholders, infrastructures and the policy and care environment. Their success will involve not just technical implementation, but also the involvement of a wide array of stakeholders each with differing values and goals, as well as local institutional policies and practices, which newly introduced technologies may or may not fit into. This

report evaluates the implementation of CRSCH and identifies the factors influencing its delivery within care homes and across the range of stakeholder organisations involved. Finally, we provide recommendations regarding the post-COVID-19 future of the CRSCH.

1.3 Aims and Objectives

Our evaluation reports on four key aims, linked to the evaluation questions set out and agreed with DHI at the beginning of the project.

1. Identify how, and to what degree, the introduction of the CRSCH programme has made a difference to the lives of care home residents, and organisational care practices among care home staff. We focus on the following outcomes:
    a. improving access to digital solutions and their everyday usage
    b. reducing social isolation, maintaining social connectedness, and promoting independence
    c. enabling access to advice, information, services, and support
    d. enhancing digital skills and confidence
2. Identify the individual and organisational factors contributing to the successful (or not) introduction, adoption, and use of digital solutions as part of CRSCH, and factors influencing any subsequent abandonment of these digital solutions.
3. Identify, the inputs, processes, and outcomes which account for the success (or not) of the intervention, including costs, strengths, weaknesses, opportunities, and priorities.
4. Make the case for whether the CRSCH should continue, based on opportunities and barriers to its sustainability and adoption at scale.

1.4 Structure of the Report

This report presents the key findings and lessons learned from the evaluation of the CRSCH programme. The sections of this report are structured around the following six sections.

Section 1. Introduction to the report.

Section 2. Project methodology and methods.

Section 3. Rapid literature review of interventions to support social isolation in care homes.

Section 4. Secondary analysis of existing and contextual project data

Section 5. Qualitative process evaluation of the CRSCH programme

Section 6. Discussion and recommendations.

2. Methods

2.1 Evaluation Methodology; the NASSS Framework & NASSS-CAT toolkit.

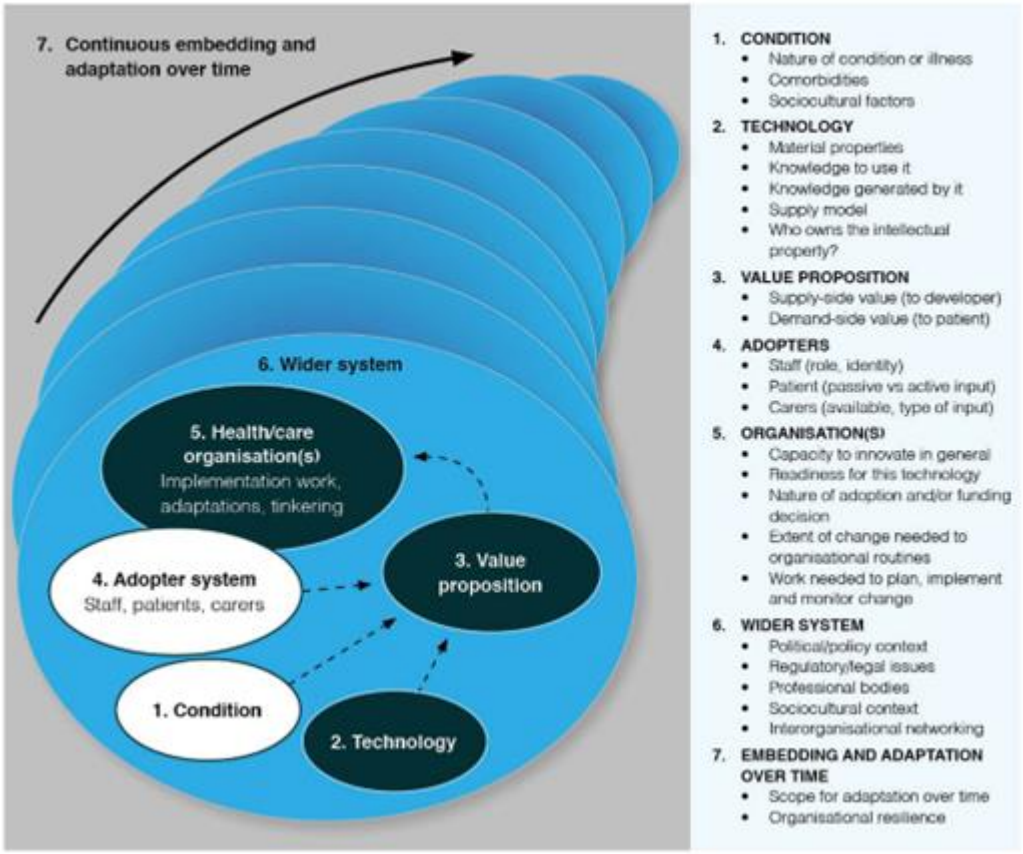

Figure 2.1: The NASSS framework (Greenhalgh et al. 2017)

The evaluation adopted a mixed methods approach, using the NASSS (Non-adoption, Abandonment, Scale-up, Spread and Sustainability) (Figure 2.1) Framework and NASSS-CAT toolkit (Greenhalgh et al. 2017; 2020). Drawing on Complexity Science and Appreciative Inquiry, the NASSS framework is a theory informed methodological framework that has been developed to explore and evaluate individual, organisational, and policy related factors influencing the adoption of technology-supported programmes in health and social care (Wherton & Greenhalgh 2021a). The NASS-CAT toolkit is a pragmatic, flexible resource which supports organisations to use the NASSS in the evaluation of their programmes. NASSS-CAT combines desk-based methods with primary qualitative and/or quantitative research to identify outcomes and individual or organisational factors influencing successful technology adoption across seven domains (Figure 2.1) (Greenhalgh et al. 2020). The NASSS framework has been used in a range of evaluations of technology projects, including the evaluation of the 'Near Me' video consulting service in Scotland (Wherton & Greenhalgh 2020), and the use of video consultation technology between care homes and health and social care professionals during COVID-

19 in Hertfordshire (Warmoth et al. 2022). NASSS-CAT provides the methods for the data collection and analysis used in this evaluation.

2.2 WP1. Secondary methods

The first phase of work in the evaluation involved a secondary analysis of existing data collected as part of the CRSCH, alongside a rapid literature review of technology interventions aimed at supporting social connectedness among older people in care homes.

2.2.1 Rapid review of technology interventions to reduce social isolation within care homes.

The aim of the review was to identify and evaluate evidence of smartphone or tablet-based videoconferencing software/hardware systems to support social connectedness, engagement, and participation and/or reduce social isolation or loneliness among care home residents. This aim reflects both the scope of technologies provided during the CRSCH programme and its proposed outcomes. While COVID-19 supplied the impetus for CRSCH, several similar interventions have operated prior to the COVID-19 pandemic and provide data that inform the findings of this evaluation. As such, we did not limit our review to programmes developed during the COVID-19 pandemic. The rapid review search methodology is reported in full in section 3.

2.2.2. Secondary Analysis of contextual and existing programme data

This phase of the evaluation involved a secondary quantitative analysis of pre-existing data collected from participating care homes. Data was provided by SCVO and included a database of care homes that applied for tablets and a database of organisations that attended digital champion training. Secondary data was also provided by the Datastore published by the Care Inspectorate in February 2022 (Care Inspectorate 2022). Finally, we conducted secondary analysis of a quantitative survey, collected as part of a CGI (Chartered Governance Institute UK & Ireland) analysis on digital connectivity in care homes in Scotland.

Secondary analysis includes a culmination of the Care Inspectorate data with the database of care homes involved in the project and the digital champions training data. These data are used to develop a map of charting the geographical distribution of care homes in Scotland who were engaged with the CRSCH programme. Descriptive statistics are used to explore the characteristics of care homes that engaged with the programme, including information such as total beds, number of residents in each room, number of staff, registered places, risk assessment score and quality grade. Finally, data were compared with the care homes who did not engage with the programme to identify any significant differences.

2.3 WP2. Qualitative Process Evaluation of the CRSCH programme

This section details the qualitative methods used in this evaluation. Ethical approval for the evaluation was provided by the General University Ethics Panel at the University of Stirling in January 2022. (GUEP approval number 5014)

2.3.1 Qualitative Interviews

We conducted 22 semi-structured interviews with 26 members of staff in care homes across Scotland who were/are involved in introducing and/or using iPads provided by CRSCH with residents. We developed a purposive sampling framework using Care Inspectorate data and data provided by DHI and SCVO, to access the diverse range of care homes. Care homes were identified based on geographical location, resident population, variations in geography (urban, rural, remote, island), size of care home and whether care homes requested any further iPads in the programme. Most participating homes provided care for older people.

At the initial stages of participant recruitment, the evaluation group circulated an email to 952 care homes, inviting the Digital Champions to participate in 30-minute interviews via video-call platforms of their preference. Two positive responses were received, which indicated that email correspondence would not be a suitable strategy to ensure a sufficient sample of interviewees. Therefore, a member of the evaluation team (IP) contacted care homes via phone calls and explained the purposes and process of the study. The latter was proven to be a more effective course of action and has been more positively received by potential participants.

We interviewed staff members who were identified within care homes as being actively involved in supporting residents to use the provided iPads. Some of these individuals self-identified as 'Digital Champions' and had received online training offered as part of the programme. However, during recruitment, it became clear that many care home staff did not recognise the 'Digital Champion' role or had not taken up the training provided as part of CRSCH. Therefore, we re-oriented recruitment to collect information from any care home staff that supported residents to use iPads. Typically, this fell under the remit of staff in existing support roles such as 'activities coordinator' or 'wellbeing coordinator' (which usually incorporates the duties of activities coordinators), but also included care home managers and staff providing direct care activities. Arrangements in some care homes were more informal, with duties to support residents either being shared among staff or falling upon a few staff who were most comfortable with technology. As a result, interviews were conducted with a wider range of staff than expected at the beginning of the project.

The research fellow (IP) conducted interviews via telephone or video conferencing software (Zoom/Microsoft Teams) with individuals or small groups of up to three staff members. Participation

was voluntary and interviewees could withdraw at any time. Interviews typically lasted 20-30 minutes. Interviewees gave verbal consent at the beginning of each interview, which was then audio recorded and stored securely. Where we recorded videos, the audio was separated from video prior to transcription. Each interviewee was given a unique identification code, and pseudonymised during the transcription process. Interviews were professionally transcribed. Interviews covered topics in relation to all seven NASSS domains. Questions pertained to the context of each care home, details about the programme implementation, the participants' thoughts regarding the value, facilitators, and challenges for residents, as well as the value, facilitators and challenges for staff and management. Finally, participants were asked to provide suggestions on potential areas of improvement. The interview guide is included in appendix 3.

2.3.2 Stakeholder workshop

We conducted an online stakeholder workshop with five members of the programme steering group. This workshop explored stakeholder perspectives about the CRSCH programme and sought to identify factors influencing the development and delivery of the programme within the wider policy context of care homes in Scotland during the pandemic.

The workshop was hosted online using MS Teams and a Miro online whiteboard, enabling a visual display and interaction by those taking part. The Miro board displayed four infographic posters that supported exploration of the wider system factors of the NASSS framework (political/policy context, regulatory or legal issues, sociocultural context, and issues of interorganisational working). During the online workshop, we co-developed a series of key points of discussion by participants that were added as 'sticky notes' to the Miro board. These themes were subsequently included in the NASSS-CAT tool by the project team. The stakeholder workshop took place in May 2022.

2.3.3 Care Home Deep Dive workshops.

We conducted four 'deep dive' workshops in four care homes in June and July 2022. We invited a subsample of care home staff who had taken part in the staff interviews to take part in a deep dive workshop and these took place at care homes in Fife (x2), Stirlingshire and Ayrshire. The participating care homes were approached through contacts already established during the interviewing phase, following a convenience sampling approach.

The workshops took place in a communal space in each care home and were conducted by two members of the research team who visited for a day. The workshops involved interactions with staff and residents about their use of iPads for example, activities they took part in via the provided iPads, their feelings associated with activities and factors influencing their use in the home. During the workshops we interacted with five staff members in varying roles and 18 residents. We developed two

posters which encouraged participants to share their comments about how they used the iPads, their impact for residents, the degree and nature of support needed to use them successfully, and any activities that residents or staff felt care homes should start, stop, and continue doing. We recorded comments from participants via post it notes added to each poster, creating a record of responses from all participants. We then transferred these images into a Miro board, where we combined responses from residents across the four participating care homes before subjecting them to analysis using the NASSS-CAT tool.

2.4. Data analysis

We analysed the qualitative and secondary data using the NASSS framework and accompanying analytical toolkit – the NASSS-CAT tool (Greenhalgh *et al.* 2020). After initial thematic analyses in NVivo for the qualitative data and analysis using SPSS for the statistical data, data from across the evaluation were re-organised using an Excel spreadsheet. This sought to capture data in relation to the seven domains of the NASSS framework (condition, technology, value proposition, adopters, organisations, wider system, embedding and adaption over time). We stored research project data according to General Data Protection Regulations and followed data management policies at the University of Stirling.

3. Rapid Literature Review

3.1 Background

The aim of the rapid review is to identify and evaluate existing evidence for iPad/tablet, smartphone, or similar videoconferencing software/hardware platforms to support social connectedness, engagement, and participation and/or reduce social isolation or loneliness among care home residents. This aim reflects both the scope of technologies provided during the CRSCH programme and the proposed outcomes of the programme. The findings of the literature review are provided to give background context regarding success of these interventions, to highlight areas of potential benefit relating to CRSCH, as well as to compare with findings from the CRSCH programme itself.

3.2 Rapid Review Methodology

The rapid review has adopted the University of Stirling Literature review methodology (Bowes *et al*. 2013), a method for rapid and scoping reviews of literature. We have also combined elements of rapid review methodology developed by Tricco *et al.* (2015a; 2015b). Rapid reviews adopt the same broad approaches as scoping literature reviews, but reduce some steps within more traditional literature reviews, to enable them to be conducted in a shorter time. In this case we narrowed our search criteria to only extract data from interventions possessing similarities with the CRSCH programme. We therefore focused on papers reporting on video conferencing platforms using tablet, smartphone or computer-based hardware and software (e.g., Zoom, Teams, Skype, Facetime). This meant wider technological interventions such as social robotics, telecare systems or exergames were excluded from our analysis. We used the 'Covidence' online systematic review platform to manage the review (www.Covidence.org).

The full search strategy and quality assessment undertaken in the rapid review is summarised in Appendix 2.

3.3 Findings

A total of twenty-five papers were identified for full text extraction. The reference list for papers included in the rapid review can be found in Appendix 1. All reviewed publications were directed to an academic audience and were published in peer reviewed academic journals. Studies reported on residents in care homes, residential homes, nursing homes, or aged care facilities, and research participants included residents, staff, social ties such as friends or relatives, and befrienders such as school students. Studies were included from the UK (4), Taiwan (4), US (4), Australia (3), Norway (2), Canada (1), Uruguay (1), France (2), Germany (1), Sweden (1) and Hungary (1). Fifteen out of twenty-four studies were published during the pandemic, and six were specifically focused on mitigating its negative impact on the social wellbeing of care home residents.

Regarding outcomes, four studies focused on the reduction of social isolation, all reporting positive changes (Table 3.1). A total of nine studies focused on the reduction of loneliness, five reporting positive, and four no notable results. Thirteen studies examined the interventions' potential to increase social connectedness and its constituent components, such as quality, type, frequency and emotional satisfaction with social interactions, all reporting positive change. Five studies examined mental health outcomes, with two studies showing improvement and three no significant changes. Nine studies addressed psychological or emotional wellbeing, with eight studies reporting positive results and one study reporting no change. Other outcomes explored in the studies involved adoption, acceptability, usability, and patterns of use, as well as positive changes such as increased mobility, improved self-care, self-efficacy, enhanced cognitive ability and desire to learn more about the functions of the given technology. Interestingly, unintended, negative outcomes were also reported such as feelings of inadequacy and awareness of frailty.

One study took a slightly different stance among others, reporting that no significant findings were drawn from a tablet-based intervention, in terms of loneliness, cognitive deterioration and self-esteem. The authors advised against "techno-optimism" which they suggest may be a potential source of bias or positive predisposition towards implementing digital solutions in care home environments (Cid *et al*. 2020).

Category of outcomes	Number of publications	Positive outcomes reported
Social connectedness and constituent components	18	18
Social isolation	4	4
Loneliness	9	5
Psychological outcomes/ wellbeing	9	8
Mental health outcomes	5	2
Physical health outcomes	1	1
Healthcare or social care service use	2	2
Social health and social support	12	12
Feasibility of intervention	7	7
Adoption of intervention	4	4

Acceptability, and usability of technology	16	16

Table 3.1: Outcomes of reviewed publications

3.3.1 Technology

Tablets

The most common hardware used in the reported interventions were tablets. Fifteen studies reported on the use of tablets, with primary uses being synchronous audio-visual communication with relatives, friends and in one case healthcare providers (Schuster & Cotten 2020), asynchronous communication with relatives (Evans *et al.* 2017; Neves *et al.* 2018; 2019), listening to music, reminiscence (Evans *et al.* 2017), as well as puzzles, games (Prophater *et al.* 2021), art/drawing (Evans *et al.* 2017), quizzes (Evans *et al.* 2017; Zamir *et al.* 2020), shopping (Ostensen *et al.* 2017), information searching, email and other uses (Schuster *et al.* 2022). The most reported tablets were Samsung Galaxy and iPad; iPads were recommended as a good choice of tablet due to their ease of use, durability, high quality of image, high quality speakers and portability (Siniscarco *et al*. 2017; Ostensen *et al.* 2017).

Skype on Wheels

Four out of the fifteen studies reporting on the use of tablets, incorporated a combined, accessible type of hardware called Skype on Wheels (SoW) (Zamir *et al.* 2018; 2020; 2021; Zamir, Allman e*t al.* 2021), which is described as "a wheelable chassis comprising an iPad or tablet for access to Skype, and a telephone handset" (Zamir *et al.* 2021, p. 1). Skype on Wheels was chosen based on its capacity to be used by older care home residents with complex cognitive and mobility challenges. In three studies, it was the only technology used (Zamir *et al.* 2018; 2021; Zamir, Allman *et al.* 2021), while in one study, part of the sample of participants used Skype TV (Zamir *et al.* 2020). In this study, the intervention included a Skype quiz, which aimed to encourage residents from three care homes in the UK to connect with each other in an online activity. Positive outcomes were reported in terms of the feasibility of the intervention, improvement in situational loneliness, as well as connectedness between participants.

Alternative devices and platforms

Among the other solutions used in the reviewed interventions, KOMP was used in one study by Badawy *et al.* (2022). KOMP is a tablet specifically designed to be intuitive, easy to use and accessible to users with varying levels of cognitive, visual, hearing and motor abilities. Badawy *et al.* (2022) examined the perspective of staff members involved in supporting the use of the devices in the care homes and reported changes in work routines, and added workload, which often included invisible tasks. Staff perceived the device to be a useful communication aid, also used for reminiscence and

other purposes, however, still restricted by individual physical and cognitive abilities. Interestingly, despite the intuitive user interface, staff used smart phones and tablets to control KOMP through a compatible app, rather than controlling the device directly through its interface. Siniscarco *et al.* (2017) selected the Tabletop videoconferencing hardware Asus AiGuru SVIT, due to its portability and ease of use, however, the authors recommended using iPads in future interventions.

In addition to accessible hardware, studies reported on the use of accessible operating systems such as In2L (Prophater *et al.* 2021). In2L was used in conjunction with Samsung Galaxy tablets for them to be optimised for use by older people. The personalised tablets provided clearly organised content, easy to find contacts as well as enhanced security features to protect older users. Their main uses in the study were videocalls, music, gaming, and puzzles, with overall positive outcomes in improving mood and reducing loneliness. Further, two examples of accessible software were reported. One intervention deployed an iPad-based communication app, which facilitated asynchronous communication through the exchange of text, images, audio, and video messages (Neves *et al.* 2019). Finally, one intervention used CIRCA (Computer Interactive Reminiscence and Communication Aid), which provided easily accessible content in the form of photographs, videos, and music, and helped researchers facilitate group activities and conversations, presenting positive outcomes (Samuelsson *et al.* 2020).

Smartphone and laptop

The use of smartphones in videoconferencing interventions appeared promising. Two studies used smartphones as the only technology (Tsai, Cheng, Shieh & Chang 2020), or in comparison with laptops (Tasi, Cheng & Shieh 2020). The former study reported on a 6-month intervention, in which smartphones were used for synchronous audio-visual communication between residents and relatives. Positive outcomes were reported in terms of reducing loneliness, as well as enhanced vitality, physical health, and improved pain scores. However, depression symptoms remained unaffected, which is consistent with findings from several other studies reporting on mental health outcomes. Tsai, Cheng, and Shieh (2020) compared the use of laptops and smartphones, and reported no significant changes in depression and loneliness, but positive outcomes in social support, with smartphones presenting significantly greater changes than laptop-based interventions. The authors attributed the difference to the portability of smartphones (Tasi, Cheng & Shieh 2020).

3.3.2 Technology implementation and use during COVID-19

Five papers specifically explored the use of digital interventions in the context of the COVID-19 pandemic. Papers explored the use of a video conferencing device specifically designed for older people (KOMP) (Badawy *et al.* 2022); volunteer perceptions of technology use in nursing home

befriending schemes (Fearn *et al.* 2021); impact of COVID-19 on information technology use in long term care (Schuster & Cotton 2022); preferences for technologies among frail older adults (TOVID *et al*. 2020), and the consequences of the pandemic on family communication between long term care residents and their families (Monin *et al.* 2020).

In their US study, Monin *et al.* (2020) highlight those familiar technologies such as the telephone, and to a lesser extent email were preferred over the use of videoconferencing devices, likely due to the higher familiarity and comfort residents may have with these devices, and because they required no technical skills among staff members. Badawy *et al. (*2022) highlights the additional work routines, tasks, and responsibilities that staff members experienced because of introducing of the KOMP videoconferencing system, which were present despite its more simplified design. The technology and unique situation in which it was implemented created demand for the device but required the 're-scripting' of routine care tasks, demanding new responsibilities and commitments from staff in their distinct roles in the home. In addition, difficulties in managing the cognitive load of using the KOMP among residents with cognitive impairment also meant residents needed more support despite its simplified design. Fearn *et al.* (2021) found that many volunteers within a befriending scheme preferred using more familiar forms of communication such as phone calls or letter writing over technology mediated communication such as videoconferencing; issues influencing this judgement included the degree of assistance on offer from staff, as well as reluctance among residents to engage with technology. Schuster *et al.* (2022) in a web-based survey of seventy long term care facilities found that just over half of their sample had purchased technology to facilitate virtual face-to-face communication between residents and their families, with benefits resulting from increased degree of connection derived from video rather than just voice. Barriers again included staff time and interest to facilitate using the technology, and reluctance among a small number of residents to engage with technology.

3.3.3 Facilitators of and barriers to successful implementation

Eight studies addressed the feasibility of each intervention either as part of the outcomes (Zamir *et al.* 2018; 2020; 2021; Neves *et al.* 2017; Neves *et al.* 2019; Magle *et al.* 2020; Mueller *et al.* 2021), or additional insights drawn during the studies (Badawy *et al.* 2022). These publications, along with four studies reporting on adoption outcomes (Neves *et al.* 2018; Neves *et al.* 2019), or added insights related to adoption (Prophater *et al.* 2021; Badawy *et al.* 2022) shed light on barriers and facilitators for the successful implementation. At an organisational level, barriers included high staff turnover (Zamir *et al.* 2018), increased workload, changing routines for staff (Badawy *et al.* 2022), limited availability of devices due to cost, staff attitudes towards technology and desire to continue its use long term (Zamir *et al.* 2018; Zamir *et al.* 2021). Facilitators and best practices included training and

supporting a range of staff within the facilities to use the technology (Prophater *et al.* 2021), members of staff becoming 'champions' for the technology (Fearn *et al.* 2021), education and awareness sessions for residents, family and friends (Fearn *et al.* 2021; Prophater *et al.* 2021), assistance from staff to residents to use the technology provided (Zamir *et al.* 2018; Zamir *et al.* 2021), and one-to-one tutoring following the individual's own pace (Ostensen *et al.* 2017). Further facilitators included providing opportunities for residents to interact with the technology, practice its use and understand its purpose; engaging the residents' next of kin and other social ties; help from staff to schedule online visits; social support from volunteers (Széman 2014); collaboration with educational institutions; and intergenerational connections (Széman 2014). Further, co-production of the intervention on each site and rigorous evaluation throughout were recommended.

Technical barriers involved connection issues, flaws in design and usability (Zamir *et al.* 2018), small size of screen, weight of device and sensitivity of touchscreen. Facilitators related to the technology involved ease of use, convenience and flexibility, portability (Siniscarco *et al.* 2017; Neves *et al.* 2018), low cost of apps (which were often free), high-quality Wi-Fi (Siniscarco *et al.* 2017) or the use of tablets with SIM cards, docking stations to recharge while using the device, updated operating systems, usability of apps (Siniscarco *et al.* 2017), online education tools for family and caregivers (Fearn *et al.* 2021), and options to aesthetically personalise the technology (Zamir *et al.* 2021).

At an individual level, barriers involved risk averseness (Zamir *et al.* 2018), feeling uncomfortable with digital technology, limited digital literacy (Neves *et al.* 2018), lack of family commitment (Zamir *et al.* 2018), not knowing what is useful when faced with too much choice, concerns about privacy (Moyle *et al.* 2019), and fear of socialisation attributed to poor self-image. Further, barriers involved health conditions, as well as motor, vision, hearing and cognitive abilities, and equivalent accessibility needs (Moyle *et al.* 2019), which on occasion could mean that a digital solution was not suitable for an individual and might affect adoption speed, usability, and continued use throughout and after the intervention. People with dementia might have positive experiences interacting with technology but might not remember how to use it later. It should be noted that non-adoption is not necessarily attributed to barriers but to personal preference as well. For example, Neves *et al.* (2019) noted that among a group of residents who all adopted the iPads they were offered, one resident chose not to; the reason presented was that her contact with relatives on the phone was already sufficient, while she preferred knitting over engaging with activities on the iPad. Facilitators involved pre-existing digital literacy, positive attitude towards learning (Neves *et al.* 2018), frequent practice (Moyle *et al.* 2019), the involvement of family or social ties (Siniscarco *et al.* 2017; Neves *et al.* 2018; Neves *et al.* 2019). The most prevalent facilitator of learning and using the technology was support from staff members (e.g., Siniscarco *et al.* 2017; Neves *et al*. 2019; Moyle *et al.* 2019; Schuster & Cotton 2020).

3.4 Discussion

Across the review, the provision of training and one-to-one support were the most effective facilitators for the implementation of the interventions. In eight papers, training was provided at the beginning of the intervention, and was found to be effective in ensuring that the residents were familiar with the technology, understood its primary functions and were able to use it. Fifteen studies found that the presence of an individual during residents' attempts to use the technology, usually a member of care home staff or a researcher collecting data, facilitated residents' engagement. Care home staff members would provide one-to-one support in real time, and adjust technology according to individual needs and cognitive, visual, hearing and motor impairments of the residents. It is therefore not surprising that care home staff were also recruited as research participants to report on the progress of certain interventions. It can be observed, however, that just a few studies examined the experiences and challenges faced by the staff in playing this crucial role (e.g., Badawy *et al.* 2022).

The specific technology selected for each intervention, as well as the infrastructure available to support its use, was central to its success. Each device brought certain benefits in terms of design, functionality, accessibility, and compatibility with apps and software. Devices were used in diverse ways, depending on the purpose(s) of the intervention, the technical skills of the care home staff, and the needs of residents. The involvement of the staff is again of significant interest, but the skills and abilities of staff to support the use of technology are not addressed in the studies as extensively as might be expected. Only six publications considered the technical skills of the staff (Szeman 2014; Monin *et al.* 2020; Zamir *et al.* 2018; 2020; 2021; Evans *et al.* 2017), and one paper considered the skills of the relatives, who may also belong to older age groups (Zamir *et al.* 2020). Where papers did explore these issues, they highlighted the increased degree of 'hidden' work required from staff to integrate technologies into their care practice, which requires consideration when discussing how such technologies may be introduced and implemented. Staff are found to play a crucial role in selecting which software will be used, while ensuring proper use, storage, and maintenance of the devices, and maximising the benefits drawn from the available infrastructure. The review highlights the need for further research and evaluation focusing on the risk of devices being damaged or needing repair after repeated use, limited availability of charging stations or other charging solutions, and the quality of the Internet connection available in each care facility.

The interventions varied in duration. In some cases, the intervention lasted for one year, and repeated stages of data collection occurred (Tsai 2011). In most of the studies, however, the intervention lasted in the best cases six months (Szeman 2014) or less, with one intervention being limited to a series of one-hour focus group sessions (Zamir *et al.* 2018). The long-term viability and feasibility of such programmes, considering the investment involved in terms of funding, as well as additional workload

for staff and management has not been demonstrated in the literature reviewed here. Based on the findings on short-term success of programmes, longer-term viability may rely on the technical skills, attitudes towards ICT among staff and management, as well as the time, financial resources, and technical infrastructure available to them, including ability to repair or update devices when necessary. Repeated phases of research are recommended to establish the scale and underlying reasons for the long-term adoption, as well as the effective use of the technology.

3.5 Conclusion

Overall, results reported in previous interventions have been positive, and have highlighted that, when used carefully, digital interventions such as video conferencing can lead to improved social connection and reduced loneliness or social isolation among care home residents. In addition, benefits are experienced by staff and family members because of this increased social interaction and connection. However, the nature of the papers discussed here, with few large, high-quality long-term studies mean such conclusions can only be partial and tentative. The findings of this review highlight that communication technologies need to be carefully matched with the intended users and the context they are living within. Several studies highlighted a preference for simpler technologies such as telephones or even pen and paper over tablets or video screens among several care home residents, due to greater familiarity with traditional means of communication (e.g., Neves *et al.* 2018). Technology may therefore not automatically be the most desired approach.

Individual care homes should consider what will be most appropriate locally for their residents, while wider schemes (such as CRSCH) should be flexible and person-centred, for example, by making different technological options available to their recipients. The COVID-19 pandemic clearly provided a driver for the rapid introduction of videoconferencing technologies, either through funded interventions such as the CRSCH, or through more ad hoc means. Few studies have been published so far specifically on the use of these interventions during the pandemic, although more are expected in due course. The findings from studies that have been published suggest that introduction of technologies had positive impacts for residents. However, these and the wider findings of the review suggest that attention needs to be paid to the means through which such technologies are integrated into usual care practices i.e., service readiness, and the impact they have in terms of changing existing care activities, roles, routines, and responsibilities of staff i.e., business readiness. Understanding the processes through which, as well as how far, such technologies can be integrated into existing care practice or require new or adapted care practices is required to ensure that such interventions are provided appropriately, and in ways which will ensure that their benefits can be sustained.

4. Secondary Desktop Analysis of contextual and existing programme data

4.1 Introduction

The following section uses existing secondary data collected by SCVO and the Care Inspectorate (February 2022) in relation to the CRSCH programme and supplied to the evaluation team. Data supplied to the evaluation team included information on the distribution of iPads and uptake across the Scottish Care home sector (including types, sizes of care home and care home provider, and number of digital champions), degree of engagement in the programme (including how many iPads were requested, and if additional iPads were requested). We also include an analysis of data provided for us on uptake and engagement in training as part of CRSCH.

In total, there were 1828 iPads provided to 1045 different organisations in our sample. The following section will focus on 1655 iPads sent to 870 care homes. The process of cross-checking between Connecting Scotland data and the Care Inspectorate data has resulted in 175 cases/care homes being deleted from the analysis. This is because the cross-checking between the two databases was done via post code and when some care homes applied for iPads, they used the name and post code of their overarching organisation (e.g., Abbotsford). This is a limitation of the following data analysis and a result of combining two databases, rather than there being issues with the completeness of the CRSCH data.

This secondary data relates to the following domains within the NASSS framework:

- The condition or illness (in this case care home residents)
- The technology
- The adopters
- The organisation
- The wider system

Other factors such as the value proposition, and the embedding and adaption over time are omitted from this section and are further explored through the qualitative data analysis presented below. The final part of this section presents the findings from the survey distributed by SCVO in conjunction with CGI.

4.2 The Condition or context

This following analysis examines findings from the secondary data on the 'condition' of the care home residents within care homes participating in the CRSCH programme. It compares the data for the care

homes participating in CRSCH with the care homes that are not participating in CRSCH, to identify any differences in characteristics of homes or among their residents. Within this section data on care home subtype, main area of care and SIMD (deprivation) rank is used to explore the nature of the conditions, illnesses and sociocultural factors that may influence these.

Of all the care homes in Scotland (n=1325), based on February 2022 care inspectorate data, there are 8 different subtypes (see Table 4.1): 59.00% of care homes are for older people, 23.50% are for children and young people and 10.10% are for people with learning disabilities. Table 4.1 indicates the care homes' involvement with the project (e.g., homes without iPads, homes who requested iPads, and homes who requested additional iPads through the programme) and how this involvement varies between the different subtypes. Key findings include:

- 79.54% of the care homes for older people engaged with the CRSCH project. 512 care homes for older people received iPads, and 110 received additional devices.
- Even though there are 311 care homes in Scotland for children and young people, only 30.22% of this subtype requested iPads. Furthermore, none of these care homes applied for additional devices, implying a drop in engagement.
- 67.16% (n=90) of care homes for people with learning disabilities requested iPads, however, only 2 (1.49%) of these applied for additional iPads.
- Of the smaller subtypes, some care homes were very enthusiastic with 100% (n=1) of blood borne virus, 83.33% (n=10) of alcohol and drug misuse, 66.67% (n=4) of respite care, 57.14% (n=16) of physical and sensory impairment and 52.94% (n= 27) of mental health problem care homes requesting iPads. Only care homes for mental health problems (5.88%, n=3) and physical and sensory impairment (3.57%, n=1) requested additional iPads.

			CH involvement with the project			Total
			No iPads	*iPads*	*Additional iPads*	
CH subtype	***Alcohol & Drug Misuse***	Count	2	10	0	12
		% within CH subtype	16.67%	83.33%	0.00%	100.00%
	Blood Borne Virus	Count	0	1	0	1
		% within CH subtype	0.00%	100%	0.00%	100.00%
	Children & Young People	Count	217	94	0	311
		% within CH subtype	69.78%	30.22%	0.00%	100.00%
	Learning Disabilities	Count	42	90	2	134
		% within CH subtype	31.34%	67.16%	1.49%	100.00%
	Mental Health Problems	Count	21	27	3	51
		% within CH subtype	41.18%	52.94%	5.88%	100.00%
	Older People	Count	160	512	110	782
		% within CH subtype	20.46%	65.47%	14.07%	100.00%
	Physical and Sensory Impairment	Count	11	16	1	28
		% within CH subtype	39.29%	57.14%	3.57%	100.00%
	Respite Care/Short Breaks	Count	2	4	0	6
		% within CH subtype	33.33%	66.67%	0.00%	100.00%
Total		Count	455	754	116	1325
		% within CH subtype	34.34%	56.91%	8.75%	100.00%

Table 4.1: Crosstab of CH subtype by involvement with the project

Table 4.2 is an advancement on Table 4.1, indicating the main area of care for the care homes that do not have iPads, received iPads, and received additional iPads. Of all the care homes in Scotland that reported their main area of care (n=961), 41.30% are for older people with frailty, 34.50% are for older people with dementia, 13.40% are for people with learning difficulties and 5.20% are for people with mental health problems (other than dementia). The key findings from Table 4.2 are as follows:

- 68.99% (n=89) of care homes for people with learning disabilities applied for iPads, although only 2 homes (1.55%) applied for additional devices.
- Similarly, 62.00% (n=31) of care homes for people with mental health problems applied for iPads, but only 3 of these homes (6.00%) applied for additional devices.
- 266 care homes, equating to 67.00% of the care homes for older people with frailty applied for iPads.
- 215 care homes, equating to 64.76% of the care homes for older people with dementia applied for iPads.
- Looking at care homes with additional devices (n = 115), 15.87% (n=63) of care homes for older people with frailty applied for additional devices, whilst 13.25% (n=44) of care homes for people with dementia applied for additional devices. The percentages for homes specialising in older people, either with frailty or dementia, suggests that the iPads are well received within this area of care, or that care homes for older people had identified greater need in relation to supporting social contact via the iPads.

			CH involvement with the project			**Total**
			No iPads	***iPads***	***Additional iPads***	
CH main area of care	***Acquired brain injury***	Count	0	2	0	2
		% within area of care	0.00%	100.00%	0.00%	100.00%
	Alcohol dependency	Count	1	2	0	3
		% within area of care	33.33%	66.67%	0.00%	100.00%
	Alcohol related brain injury	Count	3	4	0	7
		% within area of care	42.86%	57.14%	0.00%	100.00%
		Count	3	4	0	7

	Autism spectrum disorders	% within area of care	42.86%	57.14%	0.00%	100.00%
	Blood borne viruses	Count	0	1	0	1
		% within area of care	0.00%	100.00%	0.00%	100.00%
	Drug dependency	Count	0	4	0	4
		% within area of care	0.00%	100.00%	0.00%	100.00%
	Hearing impairment	Count	0	1	0	1
		% within area of care	0.00%	100.00%	0.00%	100.00%
	Learning difficulties	Count	38	89	2	129
		% within area of care	29.46%	68.99%	1.55%	100.00%
	Mental health problems (other than dementia)	Count	16	31	3	50
		% within area of care	32.00%	62.00%	6.00%	100.00%
	Neurological condition (other than dementia)	Count	1	5	2	8
		% within area of care	12.50%	62.50%	25.00%	100.00%
	Older people – dementia	Count	73	215	44	332
		% within area of care	21.99%	64.76%	13.25%	100.00%
	Older people – frailty	Count	68	266	63	397
		% within area of care	17.13%	67.00%	15.87%	100.00%
	Physical disability or illness	Count	11	6	1	18
		% within area of care	61.11%	33.33%	5.56%	100.00%
	Visual impairment	Count	1	1	0	2
		% within area of care	50.00%	50.00%	0.00%	100.00%
Total		Count	215	631	115	961

		% within area of care	22.37%	65.66%	11.97%	100.00%

Table 4.2: Crosstab CH main area of care by involvement with the project

Figure 4.1 demonstrates the mean SIMD (Scottish Index of Multiple Deprivation) for each of the three involvement groups. An ANOVA indicates that there is a statistically significant difference between these groups (F = 6.843, p = 0.001). The SIMD is a tool for identifying areas in Scotland where people experience disadvantage across various aspects of their lives (e.g., income, employment, health, education, access to services, crime, and housing). The lower the rank, the more deprived the area, the higher the rank, the least deprived the area. As seen in Figure 4.1, the care homes that received iPads have a higher SIMD than those that did not engage with the project. Furthermore, care homes that applied for additional devices and fully engaged with the initiative have a lower SIMD than care homes that only received one delivery of iPads. This implies that care homes not engaging with the project are in more deprived areas, whilst care homes in areas of less deprivation are engaging with the project. However, of the care homes that received iPads, those most likely to apply for additional devices are the homes in more deprived areas. This suggests that while care homes in more deprived areas were less likely to engage in the programme, those that did engage were more likely to participate to a greater extent than in other homes.

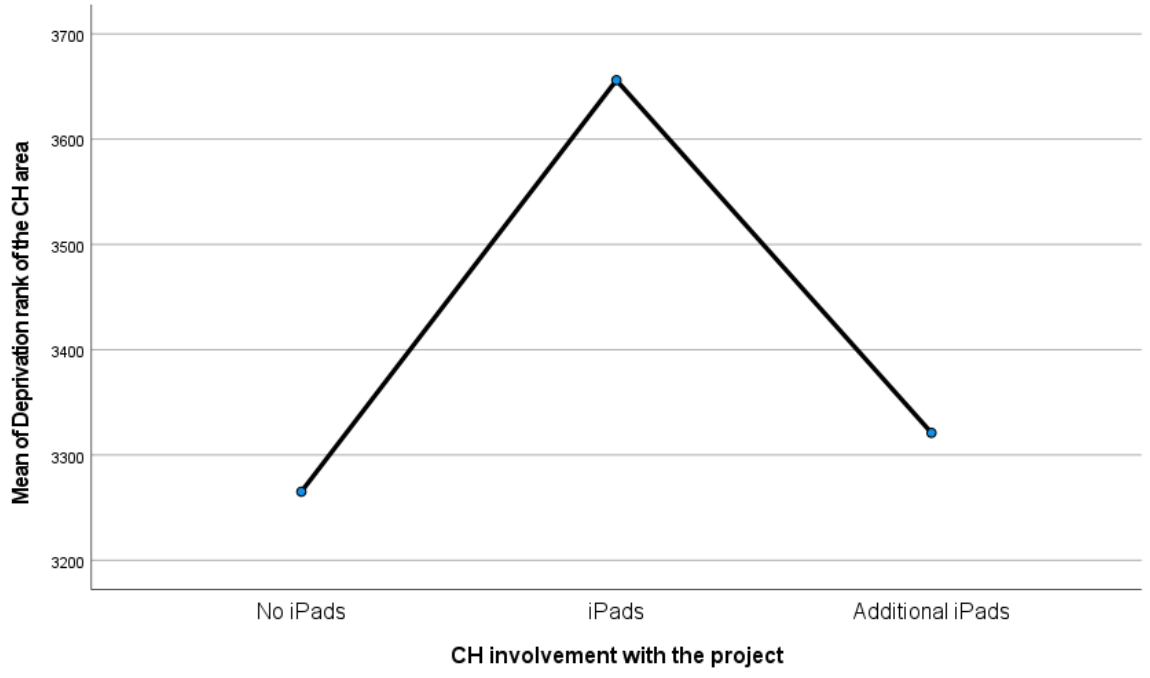

Figure 4.1: Plot of mean SIMD for the three involvement groups

Care homes with iPads are in less deprived areas and are primarily caring for older people. Most homes that fully engaged with the project and received additional devices are caring for older people. Looking more in depth at the conditions in these care homes, the devices were received by both older people with dementia and older people with frailty. Homes for older people with frailty received more additional devices, which would suggest that care homes providing support for older people with frailty are typically larger when compared to homes focusing on people with dementia.

4.3 The Technology

The following analysis provides an overview of the technological infrastructure of the care homes that applied for iPads (1655 iPads sent to 870 care homes). It presents findings on the current Wi-Fi access, resident access to Wi-Fi and previously owned devices at the care homes.

		Current Wi-Fi Access			Total
		No	***Partial coverage***	***Yes - full coverage***	
Number of iPads that the care home received	**1**	36	128	163	327
	% of CHs	11.01%	39.14%	49.85%	100.00%
	2	28	153	233	414
	% of CHs	6.76%	36.96%	56.28%	100.00%
	3	5	25	51	81
	% of CHs	6.17%	30.86%	62.96%	100.00%
	4	1	10	14	25
	% of CHs	4.00%	40.00%	56.00%	100.00%
	5	0	4	5	9
	% of CHs	0.00%	44.44%	55.56%	100.00%
	6+	1	1	12	14
	% of CHs	7.14%	7.14%	85.71%	100.00%
Total		**71**	**321**	**478**	**870**
Percentage of Care homes		**8.16%**	**36.90%**	**54.02%**	**100.00%**

Table 4.3: Crosstab of number of iPads received by current Wi-Fi access

Homes were able to request further iPads from the programme based on the number of residents in the home, with homes receiving one iPad per 20 residents. Table 4.3 indicates the number of iPads sent to care homes compared with the Wi-Fi access of the care home. Key findings include:

- In total 327 care homes (37.59%) received 1 iPad, 414 care homes (47.59%) received 2 iPads and 81 care homes (9.31%) received 3 iPads.
- Of care homes receiving iPads, 54.02% had full Wi-Fi coverage, 36.90% had partial Wi-Fi coverage and 8.16% had no Wi-Fi coverage. For care homes that had no or partial Wi-Fi, MiFi devices were provided.

Care homes with no or partial Wi-Fi coverage were more likely to request a lower number of iPads (e.g., 1-2) whilst homes that requested a higher number of iPads (e.g., 3+) were more likely to have full Wi-Fi access. Table 4.4 demonstrates the number of iPads sent to care homes compared with the resident access to Wi-Fi. Important findings from this table are as follows:

- 83.22% (n = 724) of care homes that received iPads provide residents with Wi-Fi access already. Only 2.99% (n = 26) do not provide access and 13.79% (n = 120) were unable to answer the question.
- Care homes that do not provide Wi-Fi access to residents (and care homes that are unsure) were more likely to receive fewer iPads (e.g., 1-2) whilst care homes with resident access to Wi-Fi were more likely to receive a higher number of iPads (e.g., 2+).

Table 4.5 indicates the number of iPads that care homes received compared with the technology that the homes already owned. A summary of these findings is as follows:

- Of the care homes that received iPads (n=870), 44.02% (n=383) already owned a tablet and 24.14% (n=210) owned multiple devices. Only 5.29% (n=46) owned a laptop and 4.14% (n=50) owned a mobile phone, suggesting that a tablet is the preferred technology for care homes to use. This is supported by our qualitative findings in Section 5, which also suggest that tablets are used to support a variety of other activities with residents, or by staff during administrative tasks.
- Only 16.67% (n=145) of care homes that received tablets, had not owned any technology previously.
- Care homes with pre-owned tablets and multiple devices were more likely to request a higher number of iPads (2+), whilst care homes with no previous technology were more likely to request fewer iPads (e.g., 1-2).

		Resident Access to Wi-Fi			Total
		Not answered	*No*	*Yes*	
Number of iPads that the care home received	**1**	67	17	243	327
	% of CHs	20.49%	5.20%	74.31%	100.00%
	2	39	7	368	414
	% of CHs	9.42%	1.69%	88.89%	100.00%
	3	10	2	69	81
	% of CHs	12.35%	2.47%	85.19%	100.00%
	4	2	0	23	25
	% of CHs	8.00%	0.00%	92.00%	100.00%
	5	1	0	8	9
	% of CHs	11.11%	0.00%	88.89%	100.00%
	6+	1	0	13	14
	% of CHs	7.14%	0.00%	92.86%	100.00%
Total		**120**	**26**	**724**	**870**
Percentage of Care homes		**13.79%**	**2.99%**	**83.22%**	**100%**

Table 4.4: Crosstab of number of iPads received by resident Wi-Fi access

		Equipment already owned by CH						Total
		None	*Laptop*	*Tablet*	*Mobile Phone*	*Other*	*Multiple devices*	
Number of iPads that the care home received	***1***	82	29	105	15	33	63	327
	% of CHs	25.08%	8.87%	32.11%	4.59%	10.09%	19.27%	100.00%
	2	53	13	222	13	15	98	414
	% of CHs	12.80%	3.14%	53.62%	3.14%	3.62%	23.67%	100.00%
	3	4	3	34	5	2	33	81
	% of CHs	4.94%	3.70%	41.98%	6.17%	2.47%	40.74%	100.00%
	4	5	1	10	1	0	8	25
	% of CHs	20.00%	4.00%	40.00%	4.00%	0.00%	32.00%	100.00%
	5	0	0	6	0	0	3	9
	% of CHs	0.00%	0.00%	66.67%	0.00%	0.00%	33.33%	100.00%
	6+	1	0	6	2	0	5	14
	% of CHs	7.14%	0.00%	42.86%	14.29%	0.00%	35.71%	100.00%
Total		**145**	**46**	**383**	**36**	**50**	**210**	**870**
Percentage of Care homes		16.67%	5.29%	44.02%	4.14%	5.75%	24.14%	100.00%

Table 4.5: Crosstab of number of iPads received by equipment already owned

Pearson correlations were run on the following variables: i) number of iPads the care home received, ii) number of additional devices received and iii) number of supported users on the Wi-Fi (see Table 4.6). There is a positive relationship between number of iPads received and number of supported users on the Wi-Fi (r=0.595, p=0.000), suggesting that care homes with stronger Wi-Fi supporting more people, received more iPads. There is also a relationship between number of additional devices the care home received and the number of supported users on the Wi-Fi (r=0.391, p=0.000), albeit slightly.

		Number of iPads the Care Home received	Number of additional devices	Number of supported users on the Wi-Fi
Number of iPads the Care Home received	Pearson Correlation	1	.179**	.595**
	Sig. (2-tailed)		<.001	<.001
	N	870	870	863
Number of additional devices	Pearson Correlation	.179**	1	.391**
	Sig. (2-tailed)	<.001		<.001
	N	870	870	863
Number of supported users on the Wi-Fi	Pearson Correlation	.595**	.391**	1
	Sig. (2-tailed)	<.001	<.001	
	N	863	863	863

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.6: Pearson correlations of metric technology variables

These findings indicate that care homes without a technical infrastructure (e.g., limited Wi-Fi, lower number of users on the Wi-Fi, limited resident access to Wi-Fi and no previous equipment used by residents) were more likely to request fewer iPads. This might be for several reasons including the lack of a Wi-Fi infrastructure needed to support iPad usage, wanting to evaluate the technology first before asking for more devices, a lack of confidence and a lack of technical support. The CRSCH has mostly engaged care homes that already have Wi-Fi, provide residents with access to Wi-Fi and have previous devices for residents to use.

4.4 The Adopters

This analysis examines the data relating to the adopters of the technology, mostly the staff working in the care homes and the residents within the care homes. It therefore presents data from the following variables: i) number of staff at the care home ii) number of registered places for residents iii) the Care Inspectorate evaluation score for staff and staff team iv) the number of staff who attended Connecting Scotland training. Table 4.7 presents the descriptive statistics for these variables, categorised into involvement groupings of care homes without iPads, care homes with iPads and care homes with additional iPads. Table 4.8 presents a Kruskal-Wallis test to identify if there is a significant difference between these involvement groups for each of the adopter variables. Table 4.9 presents Pearson correlations between the adopter variables and the number of iPads provided to care homes, to assess for associations between the variables. Key findings in this section include:

- Care homes with a higher number of staff were more likely to engage with the iPad intervention. For instance, the mean number of staff for homes without iPads is 23.54, for care homes with iPads is 31.14 and for care homes with additional iPads is 48.47. This difference is statistically significant as the Kruskal-Wallis is 109.228 (p=0.000).
- The number of staff at a care home also positively influences the number of iPads the care home received, which is indicated by a positive Pearson correlation between the two variables (r=0.406, p=0.000).
- Larger care homes with a higher number of registered places were more likely to engage with the CRSCH project. The mean number of registered places is 20.76 for care homes without iPads, 33.61 for care homes with iPads and 57.13 for care homes with additional devices. This difference is statistically significant as the Kruskal-Wallis is 201.873 (p=0.000).
- The number of registered places also directly influences the number of iPads the care home received, as the Pearson correlation is significant between these two variables (r=0.529, p=0.000), reflecting eligibility criteria set out at the beginning of the programme. This is unsurprising based on the allocation of iPads to homes at a rate of 1 to every 20 residents. This statistic confirms the case that iPads were allocated at this rate.
- The care homes with a lower staff-to-resident ratio were more likely to engage with CRSCH. The mean staff-to-resident ratio is 1.93 for care homes without iPads, 1.28 for care homes with iPads and only 0.87 for care homes with additional devices. This difference is statistically significant as the Kruskal-Wallis is 125.825 (p=0.000).
- The staff-to-resident ratio also directly influences the number of iPads the care home received, as the Pearson correlation is negative but significant between these two variables (r=-0.241, p=0.000). This means that care homes with a lower staff-to-resident ratio tended to receive more iPads.
- Interestingly the Care Inspectorate evaluation of the staff (Combined Evaluation of Staff and Staff Team) decreases with engagement in the project. The mean evaluation for care homes without iPads is 4.38, 4.34 for care homes with iPads and 4.16 for care homes with additional devices. This difference in the means is statistically significant at the 95% confidence level (H=7.716, p=0.021), implying that the staff in care homes receiving iPads were not evaluated as highly.
- There is a weak negative relationship between the number of iPads a care home received and the evaluation of staff members, as the Pearson correlation is significant (r=-0.083, p=0.004). This implies care homes that received a higher number of iPads are more likely to have a lower evaluation of staff members.

- The number of staff who attended digital champions training offered as part of the programme influenced engagement with the CRSCH project, as the number of staff who attended training for care homes with iPads is lower than the number of staff who attended training for care homes with additional devices. These differences are statistically significant (H=50.152, p=0.000).
- There is a statistically significant association between the number of iPads a care home received and the number of staff who attended training (r=0.168, p=0.000). This implies that care homes with more devices, were more likely to attend the training offered to care homes as part of the programme. This may be because larger homes were more likely to be able to cover staff who attended training, although our available data was unable to confirm this.

Overall, the care homes receiving iPads were more likely to have a higher number of registered places for residents, a larger number of staff and lower evaluation of staff quality. Furthermore, if staff members attended training, the care homes were more likely to engage fully with the technology and apply for additional devices. The smaller care homes with fewer staff, fewer registered places, and higher registered quality, were less likely to engage with the CRSCH project. Reasons for this are unclear but are likely to be linked to the size of properties, and resources available in smaller homes, particularly if these were in less deprived areas. This may also suggest either a lack of interest in technology in homes, or conversely that homes were better resourced with their own technology, meaning they had less requirement for devices supplied via the CRSCH programme.

		N	Mean	Std. Deviation	Std. Error	Min	Max
Number of Staff at CH	***No iPads***	406	23.54	21.894	1.087	1.8	145
	iPads	689	31.14	28.946	1.103	0	414.25
	Additional iPads	103	48.47	27.511	2.711	8.4	138.8
	Total	1198	30.06	27.432	0.793	0	414.25
Number of registered places at the CH	***No iPads***	455	20.76	23.443	1.099	0	130
	iPads	754	33.61	27.318	0.995	1	225
	Additional iPads	116	57.13	26.146	2.428	13	150
	Total	1325	31.26	27.783	0.763	0	225
Staff-to-resident ratio	***No iPads***	405	1.93	1.452	0.072	0.04	9.30
	iPads	689	1.28	1.539	0.059	0	32.00
	Additional iPads	103	0.87	0.277	0.027	0.17	1.63
	Total	1197	1.47	1.484	1.484	0	32.00
Combined Evaluation of Staff and Staff Team	***No iPads***	399	4.38	0.902	0.045	1	6
	iPads	687	4.34	0.829	0.032	2	6
	Additional iPads	102	4.16	0.887	0.088	2	6
	Total	1188	4.34	0.86	0.025	1	6
Number of staff at the training	***No iPads***	455	0.03	0.264	0.012	0	5
	iPads	754	0.17	0.592	0.022	0	7
	Additional iPads	116	0.29	0.734	0.068	0	4
	Total	1325	0.13	0.526	0.014	0	7

Table 4.7: Descriptive Statistics for Adopter Variables

	No. of Staff at CH	No. of registered places	Staff-to-resident ratio	Evaluation of Staff and Staff Team	No. of staff at the training
Kruskal-Wallis H	109.228	201.873	125.825	7.716	50.152
df	2	2	2	2	2
Asymp. Sig.	.000	.000	.000	.021	.000

a. Kruskal Wallis Test

b. Grouping Variable: CH involvement with the project

Table 4.8: Kruskal-Wallis for Adopter Variables

		No. of iPads	No. of staff at CH	No. of registered places	Staff-to-resident ratio	Evaluation of staff	No. of staff at training
No. of iPads	Pearson Correlation	1	.406**	.529**	-.241**	-.083**	.168**
	Sig. (2-tailed)		.000	.000	.000	.004	.000
	N	1323	1196	1323	1195	1186	1323
No. of staff at CH	Pearson Correlation	.406**	1	.793**	-.101**	-.146**	.024
	Sig. (2-tailed)	.000		.000	.000	.000	.397
	N	1196	1198	1198	1197	1063	1198
No. of registered places	Pearson Correlation	.529**	.793**	1	-.387**	-.221**	.047
	Sig. (2-tailed)	.000	.000		.000	.000	.087
	N	1323	1198	1325	1197	1188	1325
Staff-to-resident ratio	Pearson Correlation	-.241**	-.101**	-.387**	1	.050	-.025
	Sig. (2-tailed)	.000	.000	.000		.100	.385
	N	1195	1197	1197	1197	1062	1197
Evaluation of staff	Pearson Correlation	-.083**	-.146**	-.221**	.050	1	.006
	Sig. (2-tailed)	.004	.000	.000	.100		.832
	N	1186	1063	1188	1062	1188	1188
No. of staff at training	Pearson Correlation	.168**	.024	.047	-.025	.006	1
	Sig. (2-tailed)	.000	.397	.087	.385	.832	
	N	1323	1198	1325	1197	1188	1325

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.9: Pearson Correlations for Adopter Variables

4.5 The Organisation

This section is about the care homes as a whole and their ability to innovate and adopt the new technology. The data examined are therefore related to the type of care home service using the technology, the size of the care home, the risk factor and how the care home is evaluated according to the Care Inspectorate.

Table 4.10 demonstrates the type of care home service compared with the involvement in the CRSCH project. Of all the care homes in Scotland, 17 (1.3%) are run by a health board, 228 (17.2%) by a local authority, 791 (59.7%) are private and 289 (21.8%) are voluntary or not for profit. Key findings from Table 4.10 include:

- Private care homes have engaged more than the other types of care homes, with 478 (60.43%) receiving iPads and 101 (12.77%) receiving additional iPads. Of the care homes that applied and received additional iPads, the majority are privately owned.
- Voluntary and not for profit care homes were the most enthusiastic about the programme initially, with 61.59% (n=178) applying for devices but only 8 care homes (2.77%) applied for additional devices.
- Local authority and health board care homes were the least enthusiastic with only 42.10% (n=96) and 52.94% (n=9) respectively, applying for iPads devices.

			CH involvement with the project			Total
			No iPads	*iPads*	*Additional iPads*	
Type of CH service	***Health board***	Count	8	8	1	17
		% within CH service	47.06%%	47.06%	5.88%	100.00%
	Local authority	Count	132	90	6	228
		% within CH service	57.89%	39.47%	2.63%	100.00%
	Private	Count	212	478	101	791
		% within CH service	26.80%	60.43%	12.77%	100.00%
	Voluntary or not for profit	Count	103	178	8	289
		% within CH service	35.64%	61.59%	2.77%	100.00%
Total		Count	455	754	116	1325
		% within CH service	34.34%	56.91%	8.75%	100.00%

Table 4.10: Crosstab of involvement with the project by type of CH service

Table 4.11 provides a crosstab of care home project involvement compared to the Care Inspectorate grading, with 1 being poor and 6 being excellent. Only 2 (0.2%) care homes in Scotland received a grading of 1s and 2s, 1054 (84%) care homes received a mixed evaluation, and 199 (15.9%) care homes received all 5s and 6s. The key findings from this table are as follows:

- No poorly scored (1&2) care homes applied for iPads
- Most care homes receiving iPads and additional iPads were provided with a mixed grade. 59.01% of care homes with a mixed grade (n=622) applied for iPads and 9.49% (n=100) applied for additional iPads
- Homes that were rated excellent with 5s and 6s, were less likely to apply for iPads and additional iPads. Only 50.25% (n=100) of the excellent care homes applied for iPads and 8.04% (n=16) applied for additional iPads.

			CH involvement with the project			Total
			No iPads	***iPads***	***Additional iPads***	
What is the grade spread from the care inspectorate	***1&2***	Count	2	0	0	2
		% within CH grade spread	100.00%	0.00%	0.00%	100.00%
	Mix	Count	332	622	100	1054
		% within CH grade spread	31.50%	59.01%	9.49%	100.00%
	5&6	Count	83	100	16	199
		% within CH grade spread	41.71%	50.25%	8.04%	100.00%
Total		Count	417	722	116	1255
		% within CH grade spread	33.23%	57.53%	9.24%	100.00%

Table 4.11: Crosstab of involvement with project by Care Inspectorate grading

Table 4.12 provides the results of an ANOVA indicating if there is a significant difference between the involvement groups (no iPads, iPads and additional iPads) for the following variables: i) total beds in the care home ii) evaluation of care, support and wellbeing iii) evaluation of setting and environment and iv) RAD (risk) score for the care home, which indicates how frequently the care home needs to be investigated. Key findings from this table include:

- The mean for total number of beds increases with involvement, from 32.5 beds for care homes with no iPads, to 37.0 for care homes with iPads and 56.1 for care homes with additional iPads. This difference is statistically significant (F=34.921, p=.001)
- The mean for the combined evaluation of care, support and wellbeing is similar for care homes without iPads (4.16) and care homes with iPads (4.17) but is lower for care homes with additional iPads (3.94). This difference is just statistically significant at the 95% level (F=3.131, p=0.044)
- The mean for the combined evaluation of setting and environment decreases with involvement, as it is 4.45 for care homes without iPads, 4.36 for care homes with iPads and 4.23 for care homes with additional iPads. This difference is just statistically significant at the 95% level (F=3.333, p=0.036).

- The mean for the RAD score increases with involvement as it is 1.61 for care homes without iPads, 1.79 for care homes with iPads and 2.14 for care homes with additional iPads. The difference is statistically significant (F=22.775, p=0.001), meaning that care homes with iPads and additional iPads are ranked higher on the risk register.

		Sum of Squares	df	Mean Square	F	Sig.
Total beds in the CH	Between Groups	46966.906	2	23483.453	34.921	<.001
	Within Groups	644228.794	958	672.473		
	Total	691195.700	960			
Evaluation of Care, Support and Wellbeing	Between Groups	5.515	2	2.757	3.131	.044
	Within Groups	1085.071	1232	.881		
	Total	1090.586	1234			
Evaluation of Setting and Environment	Between Groups	4.306	2	2.153	3.333	.036
	Within Groups	762.279	1180	.646		
	Total	766.585	1182			
The RAD (risk) score of the CH	Between Groups	26.271	2	13.135	22.775	<.001
	Within Groups	762.446	1322	.577		
	Total	788.717	1324			

Table 4.12: ANOVA of Organisation Metric Variables

Table 4.13 reiterates the main findings above but looks at the same organisation-related variables against the number of iPads that the care home has received. The main findings from this table are as follows:

- Total number of beds in the care home is positively associated with the number of iPads that the care home received (r=0.491, p=0.000), meaning the more beds a care home has, the more iPads they have received, which is in-keeping with the requirements of the project.
- The RAD score is positively related to the number of iPads a care home received (r=0.238, p=0.000), meaning that care homes that are identified as being higher in risk from the Care Inspectorate, are more likely to have a higher number of iPads. This would appear to be an artefact of larger facilities receiving more iPads rather than a direct indication of the quality of care provided.

- There is a weak negative association between the evaluation of care, support and wellbeing and number of iPads a care home received (r=-0.075, p=0.009), meaning that care homes with more iPads have a lower evaluation of support and wellbeing.
- There is a weak negative relationship between the evaluation of setting and environment, and the number of iPads a care home received (r=-0.070, p=0.016), meaning that care homes with more iPads are more likely to have a lower evaluation for the overall care home environment.

		No. of iPads	Total beds in the CH	The RAD (risk) score	Evaluation of Care, Support and Wellbeing	Evaluation of Setting and Environment
No. of iPads	Pearson Correlation	1	.491**	.238**	-.075**	-.070*
	Sig. (2-tailed)		<.001	<.001	.009	.016
	N	1323	961	1323	1233	1181
Total beds in the CH	Pearson Correlation	.491**	1	.426**	-.277**	-.191**
	Sig. (2-tailed)	<.001		<.001	<.001	<.001
	N	961	961	961	932	891
The RAD (risk) score	Pearson Correlation	.238**	.426**	1	-.569**	-.388**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001
	N	1323	961	1325	1235	1183
Evaluation of Care, Support and Wellbeing	Pearson Correlation	-.075**	-.277**	-.569**	1	.566**
	Sig. (2-tailed)	.009	<.001	<.001		<.001
	N	1233	932	1235	1235	1183
Evaluation of Setting and Environment	Pearson Correlation	-.070*	-.191**	-.388**	.566**	1
	Sig. (2-tailed)	.016	<.001	<.001	<.001	
	N	1181	891	1183	1183	1183

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.13: Pearson Correlations of Organisation Metric Variables

In summary care homes that received iPads and additional iPads are more likely to be privately owned care homes with a higher number of beds. They are also more likely to be graded lower on the Care Inspectorate for care, support, and wellbeing, and setting and environment. Care homes receiving excellent evaluations (5&6) were less likely to apply for iPads. Care homes with iPads also have a higher risk factor, especially care homes that have applied for and received the additional iPads. These findings are interesting, and our qualitative research also further explores whether engaging with the

CRSCH programme is an attempt for care homes to improve their overall environment and resident wellbeing, whilst reducing their risk factor.

4.6 The Wider System

This section explores the wider system surrounding the CRSCH programme, focussing primarily on its geographical spread across Scotland. Figures 4.2, 4.3 and 4.4 demonstrate the location of all the care homes in Scotland, care homes that received iPads and care homes that received additional iPads, respectively. Comparing the differences between Figure 4.2 (all the care homes in Scotland) and Figure 4.3 (care homes with iPads), the following can be concluded:

- The CRSCH project has demonstrated reach across all of Scotland, from the Borders to the Highlands and Islands.
- The care homes that engaged the most are in the central belt and around the main cities of Glasgow, Edinburgh, Dundee, Aberdeen, and Inverness.
- Areas where care homes did not engage as much include the Borders, the North West of Scotland (e.g., Fort William and Oban), the Highlands (e.g., Thurso and Wick) and the Islands (e.g., Skye and the Shetland Islands).

By looking exclusively at Figure 4.4, here are the main findings:

- Additional devices, whether through the programme (because of their being larger) or through other sources were primarily received by care homes across the central belt of Scotland and the cities of Glasgow, Edinburgh, Dundee, Aberdeen, and Inverness.
- Care homes from Thurso and Wick in the Highlands also received additional iPads.
- No additional iPads were received by care homes on the Scottish Islands and very few in the Borders, despite initial interest from these organisations. This suggests a lower engagement rate in rural areas.

The heat map in Figure 4.5 demonstrates the care homes in Scotland that provide residents with Wi-Fi. The markers on the map are care homes that received MiFi devices from the CRSCH Programme. The main findings from Figure 4.5 are as follows:

- Care homes with resident access to Wi-Fi are predominantly in the central belt and around cities such as Inverness, Aberdeen, Dundee, Edinburgh, and Glasgow. There are some care homes on the North West Coast e.g., Fort William and Oban that provide Wi-Fi. There are also several care homes in the Highlands, Islands and Borders that have resident access to Wi-Fi.
- Most MiFi devices have been provided to areas in the central belt of Scotland, where care homes have also engaged with the iPad project and there is good resident access to Wi-Fi.

- There are also areas in Scotland where there is no resident access to Wi-Fi and the MiFi devices have been provided to rectify this. While access to Wi-Fi will largely be a choice of the management of homes, the quality of the broadband infrastructure supporting internet access will have a geographical element, in which rural and isolated areas are more likely to have poor internet quality. Areas the MiFi devices have reached include the Shetland Islands, the Isle of Skye, areas in the Highlands (e.g., Talmine), rural areas (e.g., North-East) and areas in the borders (e.g., Hawick) suggesting that the cellular telephone network was able to complement or cover gaps in broadband access in these areas.

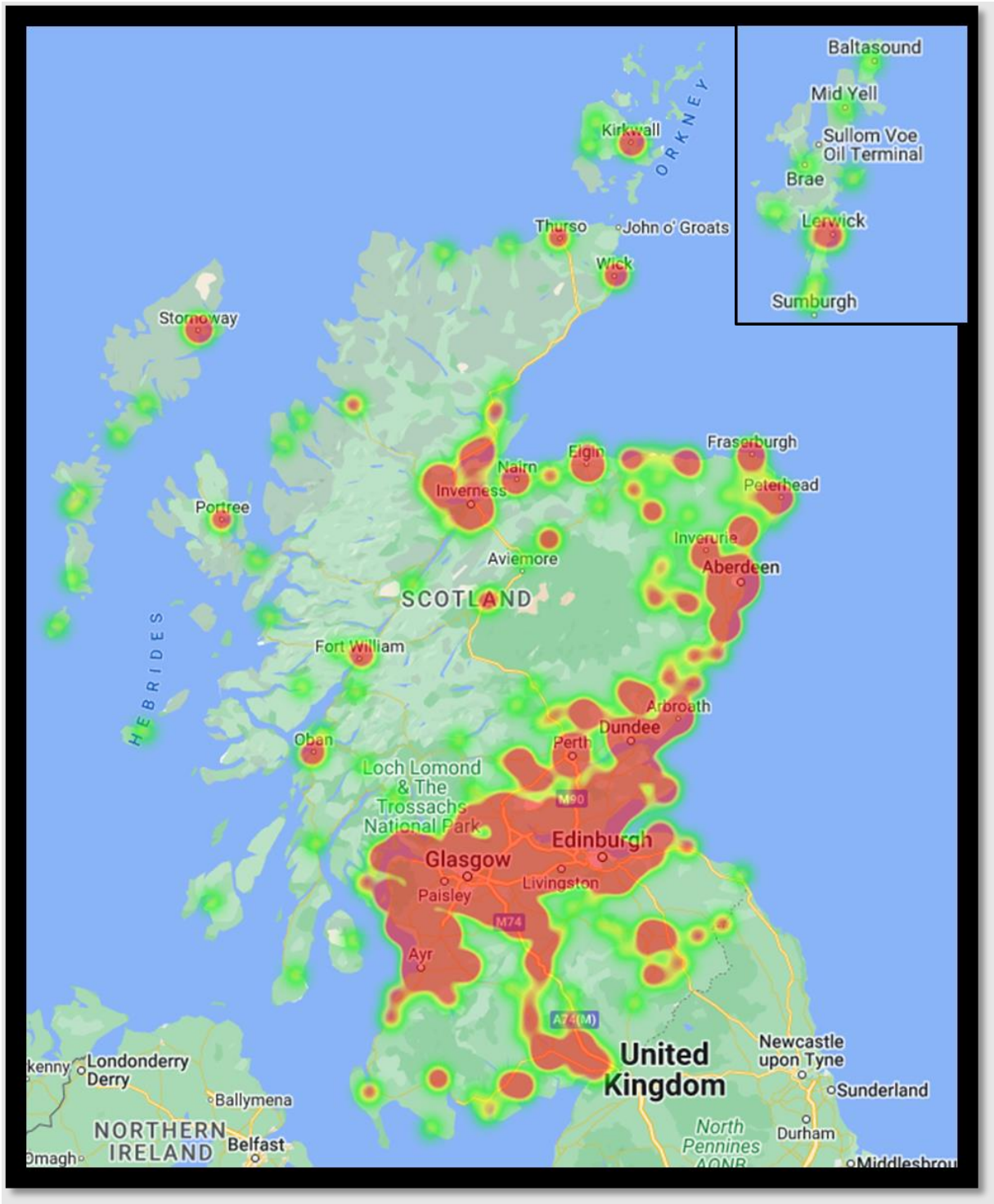

Figure 4.2: Heat map of all the care homes in Scotland

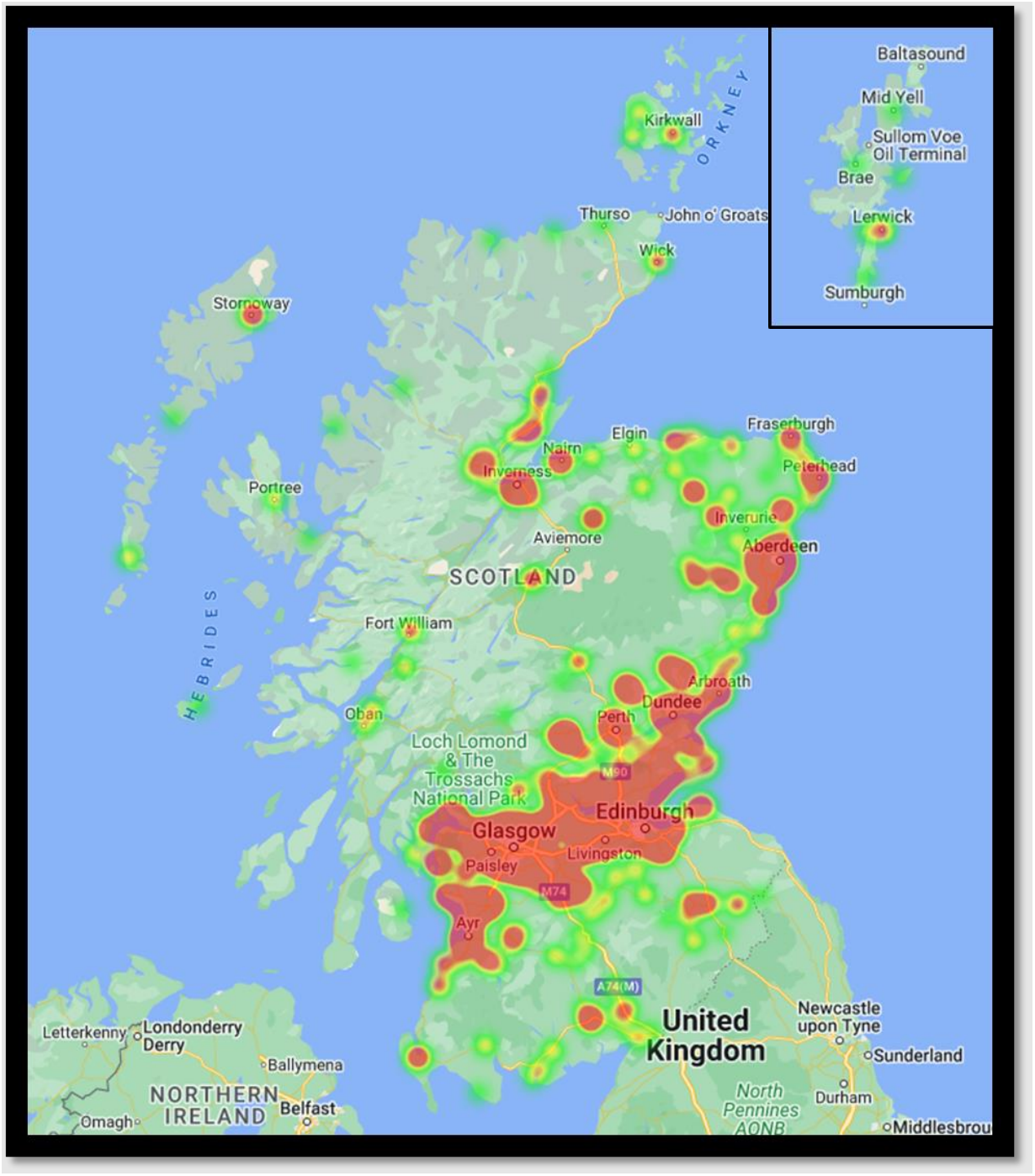

Figure 4.3: Heat map of care homes in Scotland with iPads

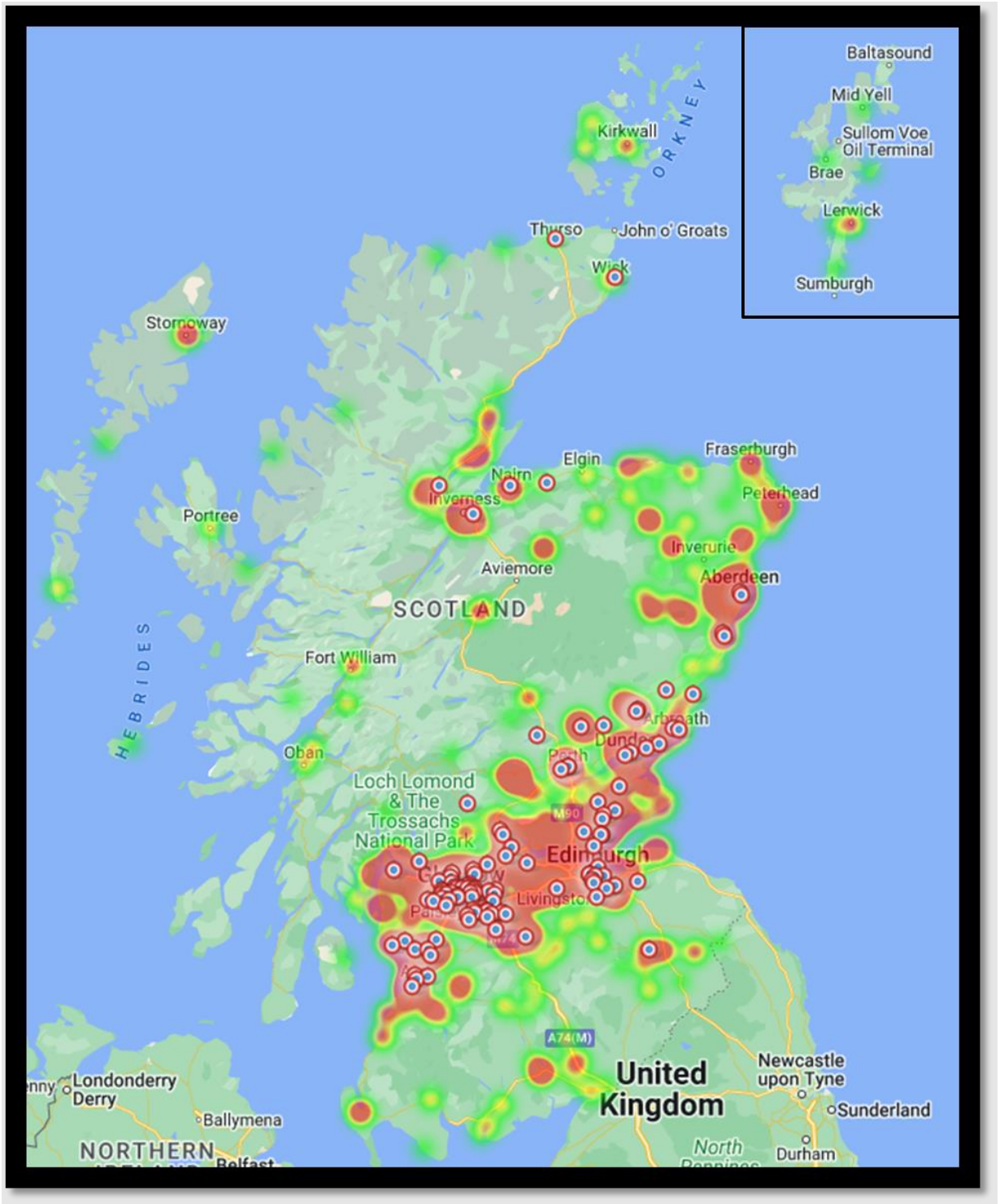

Figure 4.4: Heat map of care homes in Scotland with iPads and marked additional iPads

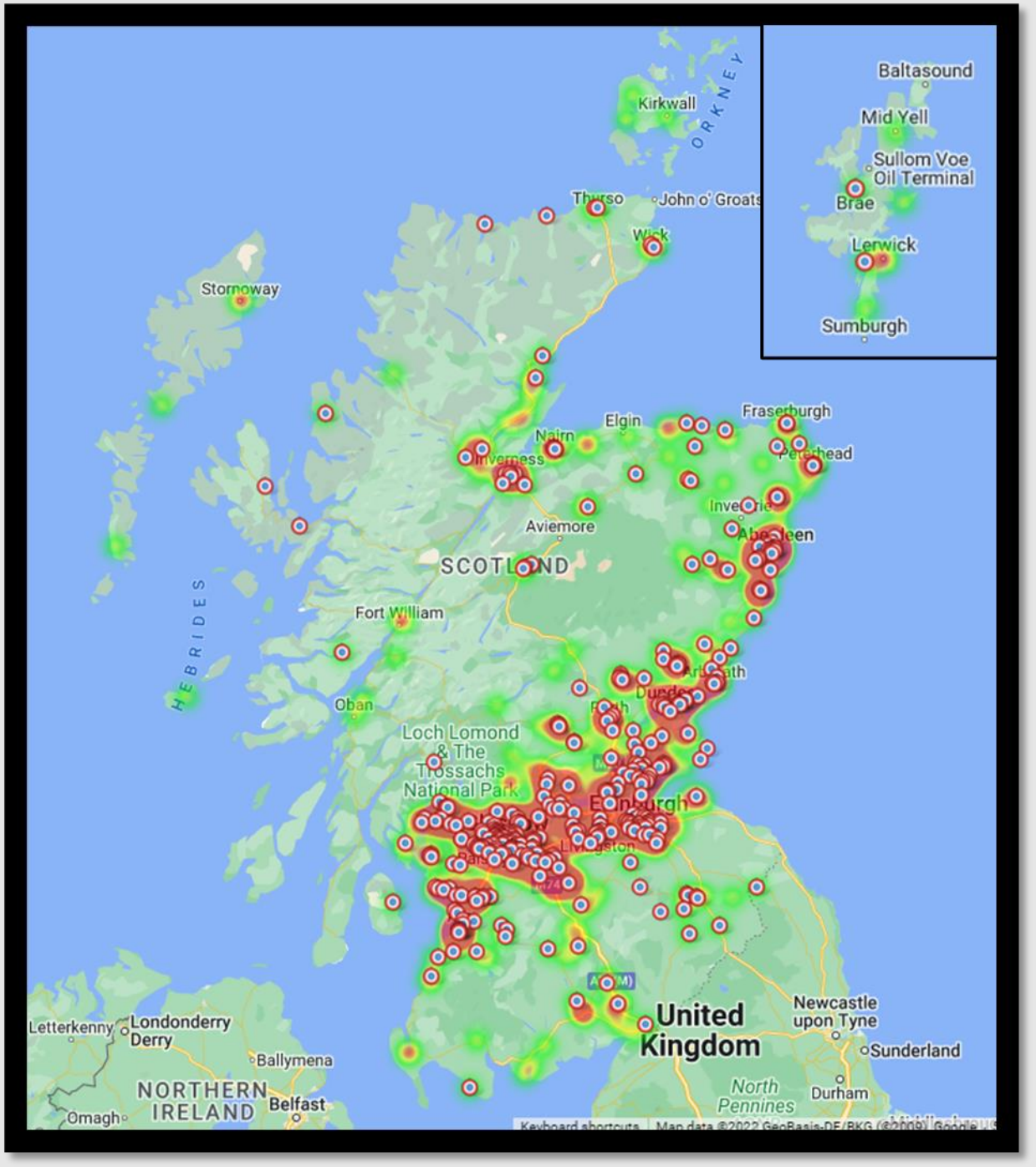

Figure 4.5: Heat Map of care homes in Scotland where residents have Wi-Fi, marked with care homes that received MiFi devices.

4.7 Report on CGI survey data.

We conducted a further secondary analysis of data report from a survey distributed by SCVO in conjunction with CGI to gather data on the challenges faced by care home providers and their staff when providing and using technology within care homes. Our secondary analysis sought to determine perceptions among staff regarding the implementation of iPads as part of CRSCH, and facilitators and barriers in relation to the technology. We conducted this secondary analysis in place of designing our own survey because of the significant overlap between questions in this existing survey and the aims and objectives of the evaluation. In addition, we wanted to avoid 'research fatigue' among care homes by providing repetitious requests for similar data. Low response rates, which are well known within research in the care home sector were also identified as an issue, with initial intelligence from CGI suggesting that this was also a challenge in their survey.

There are sixty-nine responses to the CGI survey. Of respondents to the CGI survey, sixty-two are from care home employees, five are from family and friends of residents and two are from care home residents. Of the care home staff, twenty-seven are management, twenty-four are carers, nine are other and two are administrative. Key findings from the CGI survey include:

- Of the sixty-two care home employees, 38.71% found the introduction of iPads successful, 54.84% felt there was some success, but improvements were needed, 3.23% said there was no success and 3.23% were not aware of any recent interventions. This suggests that from the perspective of care home staff the introduction of iPads was generally successful.
- Most care home staff feel as if they do not have enough time to support residents with technology but when technology is used, they have had a positive experience implementing it and it saves them time on paperwork or administrative duties.
- Staff find that residents experience the following barriers when using technology: remembering passcodes or login details, navigating the devices to call friends and family, physically using devices such as touching buttons, and reading text on devices. This suggests that accessibility of the technology needs greater consideration, or that staff and residents lacked knowledge about accessibility features within the tablets themselves, which could improve this experience. The findings may also reflect a difficulty for several care home residents to engage with technology without encouragement and support. Other contextual factors may include the impact of COVID's spread, or lockdown measures on staff availability, or impact of masks and personal protective equipment on communication. This is explored in greater detail in Section 5.

- Within the care homes, tablets are the most frequently used technology (n=53), followed by virtual assistants (n=35) and smartphones (n=35). Some care homes have desktop computers (N=21) and interactive televisions (n=18).
- 35.48% of employees felt that care homes had enough technology already, but 53.23% felt there was not enough and 11.29% were unsure.
- When it comes to Wi-Fi coverage the results were mixed, with sixteen (23.19%) care homes having Wi-Fi throughout the whole building and seventeen (24.64%) having it available in most places. Fifteen (21.74%) care home staff said it was spotty and inconsistent, three noted it was in a few rooms or communal areas and nine reported that there was hardly any. Only two respondents were unsure. Access to good quality Wi-Fi is increasingly judged as an essential requirement of an accessible environment, however these findings suggest that many homes are facing barriers based on quality Wi-Fi or broadband internet connections, or on judgements about the necessity of the technology.
- 46.77% of staff agreed that new technology was extremely easy or somewhat easy to get up and running. 19.35% were unsure and 32.26% of employees felt that technology was somewhat or extremely hard to install. This suggests that awareness regarding how to use the technology, while improving, remains a significant barrier across the sector.
- A mix of training has been offered including online videos (33.87%), how to guides (27.42%), on-site training (25.81%) and remote (online) training (22.58%). Only 14.52% of respondents attended the online digital champion training offered by Connecting Scotland and 33.87% of staff have had no technical training at all. There appeared to be a lack of awareness of ongoing training workshops (74.19%). For some homes, access to adequate training appeared to be a significant hurdle that homes needed to overcome prior to engaging with the programme. This aspect is explored in greater detail in section 5.
- Only 17.74% of respondents are aware of a digital champion working at the care home, 4.84% of staff mentioned that they had one who never engaged and 1.61% reported that they have one but are unsure of who they are. 75.81% of staff highlighted that they have never had a digital champion, or they are not sure what the terminology is referring to. This lack of awareness regarding formal training about the wider Connecting Scotland programme or regarding CRSCH as a component part of Connecting Scotland is also made in our qualitative data discussed later in this report.

4.8 Conclusion

This section has provided details on characteristics of care homes in Scotland taking part in CRSCH, the technology currently being used itself, and how this technology integrates with the infrastructure

of the care homes. The care homes that fully engaged with the project are mainly in the central belt of Scotland and around the main cities of Glasgow, Edinburgh, Dundee, Aberdeen, and Inverness. Care homes with a better technology infrastructure (e.g., widespread Wi-Fi, residents' access to Wi-Fi and previous devices) have received more iPads throughout the programme and are more likely to fully engage. The report has also examined the adopters (e.g., staff and residents) of the iPads and discovered that engagement with the programme is higher for care homes with more staff and more residents and a lower staff-to-resident ratio. Moreover, the organisations involved in the project are mostly private care homes with a higher number of beds. The Care Inspectorate grading is slightly lower and risk factor is higher for care homes that engaged with the programme.

Finally, secondary analysis of CGI survey data suggests that overall response to the programme among staff members in care homes was high, with a large majority feeling the programme had had some success. However, barriers were highlighted in terms of staff awareness regarding training offered within the programme, the lack of awareness about their digital champion, and the support made available to these nominated digital champions, a term largely unknown among care home respondents. Patchy Wi-Fi within buildings and a lack of time among staff to support residents to use technology were further barriers to adoption of technology. Finally, familiarity and accessibility issues were highlighted as barriers, with many reporting their residents struggling with tablet interfaces, despite their seemingly intuitive design.

5. Analysis of qualitative project data using the NASSS framework

5.1 Background

This section reports on findings from interviews with members of care home staff, deep dive care home visits and the stakeholder workshop. The interviews and deep dive care home visits aimed to develop insights regarding the practical implementation of the programme, through the perspective of members of staff and management who have been involved in supporting the daily use of the iPads, as well as the residents themselves. The stakeholder workshop offered clarity in terms of the broader objectives, challenges, and outputs of the programme. This part of the evaluation addresses all seven domains of the NASSS. Table 5.1 presents each domain and the aspects which were explored through the analysis of the interviews.

1. THE CONDITION OR ILLNESS	Deeper understanding of context in care homes
	Characteristics of residents
2. TECHNOLOGY	How much iPads are being used
	What is being used
	Training needed
	Issues with getting technology
	How are tablets being used - for which purposes?
3. VALUE PROPOSITION	Value of technology to the care homes
	Impact for residents
	Impact for family and friends
4. ADOPTERS	Role of digital champions
	Impact and importance of training
	Working with residents - experiences
	Working with other staff - experiences
	Barriers
	Facilitators
	Role of family and friends
	Learning derived from technology
5. ORGANISATION(S)	Challenges/facilitators in different care homes
	Organisational culture

	Impact on wider work in care home
	Staff roles - how work is organised
6. WIDER SYSTEM	Using tablets to connect to other services
	Larger care home groups/companies - organisational policies
	Support from DHI - connections to national programme
	Messaging around use of tablets, National policy for digital inclusion, social care in the pandemic
7. EMBEDDING AND ADAPTATION OVER TIME	Changes over time
	Responding to change in pandemic restrictions
	Embedding use of tablets going forward
	Reasons that tablets may not be used going forward
	Integration of tablets in everyday life of care home

Table 5.1: NASSS framework domains applied in the analysis of the interview data

5.2 Research participants

Five stakeholders from four institutions participated in the stakeholder workshop and contributed their thoughts and experiences regarding the programme. Table 5.2 presents the anonymised list of participants, their role titles, and institutions with which they are affiliated.

Stakeholder Workshop Participants - 26/05/2022		
SH1	Project Manager	Technology Enabled Care (TEC)
SH2	Transforming Workforce Lead	Scottish Care
SH3	Digital Participation Manager	Scottish Council for Voluntary Organisations (SCVO)
SH4	Deputy Chief Executive	Digital Health & Care Innovation Centre (DHI)
SH5	Research & Knowledge Management Officer	Digital Health & Care Innovation Centre (DHI)

Table 5.2: Stakeholder workshop participants

During the interviewing phase, twenty-two interviews were conducted with twenty-six participants, 50.4 years old on average, 30% male and 70% female, all British, with varying current job titles, including Care Home Manager, Duty Manager, Director, Activities Coordinator, Wellbeing Coordinator, Team Leader, Care Officer, and Senior Care Officer. Table 5.3 presents the anonymised list of interview participants, and Figure 5.1 indicates the locations of the care homes. The care homes shown in blue colour participated in the interview process, while the ones shown in orange agreed to participate in deep-dive workshops.

Interview date	Age	Gender	Role	Ethnicity	Location
20/04/2022	35-44	Male	Care Home Manager	Scottish - British	Stirlingshire
22/04/2022	18-24	Male	Activity Coordinator	Scottish - British	Ayrshire
25/04/2022	45-54	Female	Care Officer	Scottish - British	Perthshire
28/04/2022	55-64	Female	Care Home Manager	Scottish - British	Glasgow
28/04/2022	45-54	Male	Director	Scottish - British	Fife
29/04/2022	55-64	Female	Wellbeing Coordinator	Scottish - British	Stirlingshire
	25-34	Female	Wellbeing Coordinator	Scottish - British	
02/05/2022	55-64	Female	Activity Coordinator	Scottish - British	Perthshire
06/05/2022	55-64	Male	Care Home Manager	Scottish - British	Aberdeenshire
06/05/2022	25-34	Female	Business and Operations Director	Scottish - British	Fife
06/05/2022	45-54	Male	Wellbeing Coordinator	Scottish - British	Glasgow
	55-64	Female	Wellbeing Coordinator	Scottish - British	
	55-64	Female	Wellbeing Coordinator	Scottish - British	
06/05/2022	65+	Female	Care Home Manager	Scottish - British	Angus
10/05/2022	55-64	Female	Activities Coordinator	Scottish - British	Perthshire
10/05/2022	65+	Female	Care Home Manager	British	Ross
18/05/2022	55-64	Female	Care Home Manager	Scottish - British	Stirlingshire
19/05/2022	45-54	Male	Wellbeing Coordinator	Scottish - British	Renfrewshire
20/05/2022	35-44	Female	Care Home Manager	Scottish - British	Kincardineshire
	35-44	Female	Team Leader	Scottish - British	
15/06/2022	45-54	Female	Care Home Manager	English - British	Borders
17/06/2022	35-44	Male	Team Leader	British	Shetland
21/06/2022	35-44	Female	Senior Care Officer	Scottish - British	Argyll & Bute
22/06/2022	55-64	Female	Care Home Manager	Scottish - British	Orkney
23/06/2022	65+	Female	Care Home Manager	Scottish - British	Ayrshire
27/06/2022	35-44	Male	Duty Manager	Scottish - British	Orkney

Table 5.3: Interview participants

Finally, four deep dive visits were conducted in care homes located in East Ayrshire, Stirlingshire and Perth and Kinross. In total, 18 residents and 5 members of staff participated in the workshops. Table 5.4 presents an anonymised list of the participants

Deep dive care homes and participants			
10/06/2022: DDCH1 - East Ayrshire			
Participant ID	**Role**	**Age range**	**Gender**
101	Resident	65+	Female
102	Resident	65+	Female
103	Activities Coordinator	18-24	Male
104	Resident	65+	Female
105	Resident	65+	Female
1/07/2022: DDCH2 - Stirlingshire			
Participant ID	**Role**	**Age range**	**Gender**
201	Resident	65+	Female
202	Activities Coordinator	25-35	Female
203	Resident	65+	Female
204	Resident	65+	Female
7/07/2022: DDCH3 - Perth and Kinross			
Participant ID	**Role**	**Age range**	**Gender**
301	Resident	65+	Female
302	Resident	65+	Female
303	Resident	65+	Male
304	Resident	65+	Female
305	Resident	35-45	Male
306	Manager	55-64	Female
307	Lead Care Practitioner	45-54	Female
11/07/2022: DDCH4 - Perth and Kinross			
Participant ID	**Role**	**Age range**	**Gender**
401	Resident	45-54	Female
402	Resident	35-44	Female
403	Lead Wellbeing Coordinator	25-34	Male
404	Resident	55-64	Female
405	Resident	55-64	Female
406	Resident	55-64	Male
407	Resident	55-64	Female

Table 5.4: Deep dive care home participants

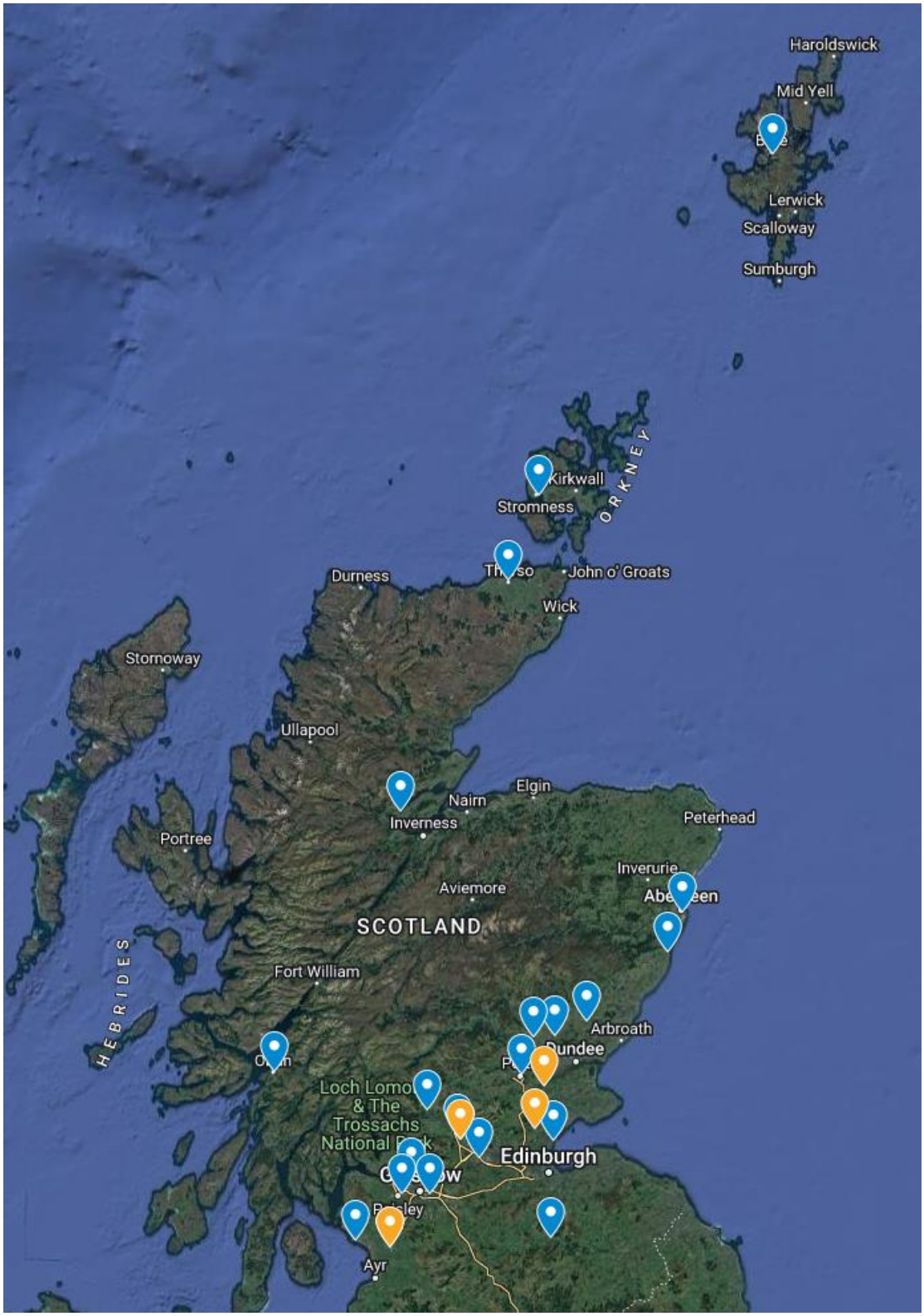

Figure 5.1: Map of participating care homes (Created with Google Maps)

5.3 Results of the Qualitative Process Evaluation.

In this section we report the results of the qualitative process evaluation. This included data collected from interviews with care home staff, deep dive workshops with residents and staff and the stakeholder workshop. Findings are organised using the NASSS framework domains.

5.3.1 The condition or illness

To address the first domain, we analysed the data with a view to gain a deeper understanding of the context of the care homes and the main characteristics of the residents. The first domain had implications on the implementation of the programme, as will become evident in later sections. Table 5.5 demonstrates the characteristics of the residents from twenty care homes represented by online interview participants, four 'deep dive' care homes, and two organisations managing multiple care homes. Two of the deep dive care homes were initially represented in the interviews, therefore CH1 is DDCH1 and CH3 is DDCH2. Further, two deep dive care homes were managed by the two organisations represented in the interviews. DDCH3 is managed by Org2, and DDCH4 is managed by Org1.

Participants were asked about the main characteristics of the care home residents with which they were working. In most facilities the residents were older adults and in some cases adults with care needs due to impairments or injuries. Most of the care homes accommodated residents with dementia and other cognitive impairments. During the conversations, participants reported that residents frequently presented with visual, hearing, cognitive and physical impairments as well as frailty. Larger care homes with mixed groups of residents were often structured in multiple units which were located on different floors or buildings.

The iPads were provided at a challenging time for care facilities. Due to COVID-19 restrictions as well as the risk of outbreaks, relatives were not permitted to visit the residents, thus limiting the residents' opportunities to maintain social contact:

> *"Because obviously we were in the middle of a pandemic and the contact between residents and families and staff and families was quite limited. It's a massive part of care that the families are involved as much as possible with the residents who live here" (CH9).*

Care homes	Characteristics of residents
CH1	Adults over 60, dementia, learning disabilities or other conditions.
CH2	Nursing care needs, from physical ailments to dementia. Varying mobility.
CH3	Older adults and adults with dementia.
CH4	Older people over the age of 65, frailty, dementia, physical and mental disabilities.
CH5	Frail elderly requiring nursing care and adults with dementia
CH6	Older people, age 80 or above, varying abilities.
CH7	Mental Health Issues
CH8	Adults with dementia, young people with learning disabilities, people with Huntington's, ages from 29 to 90.
CH9	Adults with dementia
CH10	Brain injury, older adults with dementia.
CH11	Older people, adults with dementia, aged 67 - 96
CH12	Frail older people dementia, and Downs Syndrome.
CH13	Older people and people with dementia
CH14	Older people, the majority with dementia
CH15	Older people, the majority with dementia
CH16	People who need nursing care, respite care and people living with dementia
CH17	Older people, 65 years old or above, frail, people living with dementia, varying mobility
CH18	Older people, living with dementia or physically frail
CH19	Adults over the age of 18 with various conditions, mainly older adults with dementia
CH20	Older people with frailty, older people with dementia
DDCH1	Adults over 60, dementia, learning disabilities or other conditions.
DDCH2	Older people and adults with dementia.
DDCH3	Older people who need residential, nursing or respite care, adults under 65 needing specialist care
DDCH4	Older people, and adults under 65 with complex care needs
Organisations	
Org1	Older people over the age of 65 and adults between 18 and 65 with varying medical or social care needs.
Org2	Older people and adults with various care needs.

Table 5.5: Characteristics of care home residents.

Even when restrictions were eased in the wider community and visits were permitted, care homes maintained certain health and safety measures:

> *"The Scottish Government have lifted all restrictions, but they haven't lifted them in care homes, so we're still under strict guidance with regards to visitors and family visiting, so we can use the iPads to compensate for the fact that we're still…restrictions that you might not have in the wider community" (CH10).*

Outbreaks resulted in temporary restrictions being put in place:

> *"Well, definitely when we were locked down and we, as a care home, had a wee lockdown in January because of the virus. And then they're really beneficial then, for keeping in touch with relatives outside" (CH11).*

The above data highlight that the initiation of the programme was well justified by the circumstances facing Scottish care homes during lockdown, and that there was an immediate need for the support provided at that time.

5.3.2 The Technology

We saw evidence to suggest that iPads quickly became embedded into the daily life of the care home, with their continuing to be used daily for activities as well as some video calls. The focus of the interviews were the iPads provided by CRSCH, and all participating care homes received at least one iPad through the programme. Participants reported having access to several devices ranging from one to four as well as MiFi in some of the care homes. We found evidence in both interviews and deep dive workshops that the iPads were not the only technology which were used, but were often combined with other technologies including large monitors, Amazon Fire, and Google Chromecast USB adaptors, interactive screens as well as iPads and other tablets previously owned or obtained after the programme had started:

> *"We already had iPads in the building, we also have the giant interactive screens as well in all our homes" (Org1).*

> *"Now, we've just purchased new televisions, smart TVs, so we can hook the iPad up to the TVs and do quizzes with the residents. And they can see the questions as well as listen to them. And music. There's a big thing for music just now, downloading stuff on to YouTube and putting it on to the TVs for the residents via the iPad" (CH15).*

The CRSCH is not the only programme supporting care homes by providing tablets, as evidenced by several accounts:

"We got two and then we sourced some others from different charities and managed to give us a few more. So, we got six in total" (CH4).

Participants often expressed the opinion that the iPads specifically were a very good choice in terms of ease of use, familiarity, and accessibility across a broad range of needs:

"The iPad I think it still the best tablet on the market. I think it is the easiest one to use. Everything about it works well for us. We have used other tablets in the past and they are not as quick, they are not reliable. The iPad is the best one" (Org1).

Use of the iPads was at its highest shortly after their provision, as Scotland entered the second COVID-19 wave and national lockdown in late 2020. During this period all the homes used the technology to facilitate video calls. Multiple platforms were used, including Facetime, Skype, Zoom, Teams, and Messenger:

"Their main uses were for video calls through Skype and FaceTime, particularly with relatives who could not visit because of COVID" (Org2).

During this period, most care homes who participated in the programme reported using iPads daily, which entirely replaced in-person visits by friends or relatives:

"I think it would be that at the peak of the time we were using them, when there were actual lockdowns, there were just…there were so many people asking and trying to organise appointments at that time" (CH6).

In addition, several residents in participating homes had sourced their own tablets, typically being provided to them by family members to support social contact, as well as to watch videos or play games:

"We do have other residents, we have I think three residents who have their own iPads, and they obviously use them…And a lot of the residents have got iPhones as well because the family phone through FaceTime to them" (CH5).

As COVID-19 restrictions began to ease, interview participants noted that the use of the iPads did reduce. In one case the tablets had been abandoned, although reasons for abandonment were also associated with types of residents over the declining importance of iPads as restrictions eased:

"Yeah. They're not used as much as they were. Not at all now. It's more to do with the actual residents that we have at this moment in time. They're very much end of life. We

don't have a huge amount that are early stage and the people who we have, have got very complex dementia needs" (CH20).

While use of the tablets for the original purpose of video calls did decline, wholesale abandonment of the technology on the lifting of restrictions was rare in our sample.

There was clear evidence that devices were also used to facilitate a range of other activities in each home. Staff started to develop a wider range of uses for the tablets as they became more familiar with the technology. Increasingly staff used tablets in creative ways to support their care activities. Only two participants reported that the iPads were only used for video calls, one pointing out that they were no longer necessary and the other reporting reduced use since COVID-19 restrictions were eased. However, it was clear that most care homes had integrated the iPads into their wider activities, using them to provide a wide range of other social activities with the residents:

"I would definitely say that as a service we've probably moved away from the digital calling aspect of things. Obviously, that was a huge thing, you know, when the pandemic was at its peak and, kind of, through the different waves that we've had for the pandemic, and like, the lockdowns that's taken place. The video calling aspect has definitely declined, but that has been in recognition that loved ones are actually coming into the building, we're able to welcome them and guidance has changed. I would definitely say it's much more of the later stuff that I was speaking about just now, around the, kind of, looking up different images when service users are speaking about things, and staff just doing that ad hoc, kind of, research about a particular aspect of a condition, or, you know, that games aspect is probably more what we're doing now. Obviously, the big thing for us is also being able to take pictures of little events that we've been having. So obviously, it's been the Platinum Jubilee for the Queen and, you know, our service did a little jubilee afternoon for the service users. So, being able to take pictures and, you know, use it as that kind of camera function as well. And it being there for service users to see it on a screen immediately, rather than looking at a tiny little screen on a camera within the building. So, it's used for a lot of different purposes now compared with maybe in the beginning" (CH19).

For many care homes, technology adoption was an ongoing process, but CRSCH clearly helped to further accelerate this process during a critical period. The initial and primary use was the stated goal of CRSCH – of facilitating social contact by enabling video calls between residents and their relatives. But it was clear that the iPads were widely used for a multitude of different purposes.

For residents who were able to engage, commonly reported activities were listening to or streaming music, taking photographs, watching videos of television programmes, films, or uploaded content on platforms like Netflix or YouTube. Reminiscence proved particularly popular as an activity, with activity coordinators creating personalised reminiscence activities using music platforms like Spotify, searching for YouTube videos with residents, or creating photo albums for reminiscence purposes:

> *"So, we would use Zoom an awful lot with it. If the families had iPads, we would use FaceTime. And also as well, when residents were unsettled, we may go into their room with the iPad and go onto YouTube and maybe watch an old clip of where they were born. And interest that the resident had, you know, we'd maybe go onto YouTube and find something of interest for them, or any hobbies. So it was used a lot for that. It still is, actually" (CH5).*

Other activities which people took part in using the iPads included solving puzzles, crosswords, games, joining online fitness classes, general browsing, online shopping, using Google maps to find familiar places. In one of the deep dive care homes (DDCH1), the activities coordinator (103) described creating individualised activities using videos and music playlists for several residents in their home. These activities were often highly personalised to reflect the interests of individual residents, for example by creating custom playlists of videos or music according to an individual resident's interests. Other homes streamed content from iPads onto larger television screens in homes, enabling groups to choose then watch videos, television programmes or movies.

iPads were also used to facilitate access to health services, such as GP, physiotherapy, and mental health support, or services that usually occurred in the homes during the extended lockdown periods of 2020 and 2021. On some occasions the iPads were used to replace visits with doctors or other service providers:

> *"I suppose during lockdown, you were able to still have meetings with consultants or people that you needed to maintain the residents' health, because GPs et cetera wouldn't come into the home to do like house calls. So at least with the iPad, you could take the iPad, see whether the resident had a rash, you could take the iPad and show the GP the rash, you know, you could show him the resident, what they looked like, how they were feeling, and then they didn't have to come in to physically see the resident" (CH8).*

> *"There were some residents on occasion used them to contact like a physiotherapist, for instance, or I think there was someone who needed mental health support was speaking to somebody" (CH6).*

The provision of healthcare services online continued after lockdowns, with the expectation that many such appointments would become a permanent feature:

> *"So, they'll do a video call in some cases if they need to see the person. Or if the resident themselves wants to see a doctor…so that has been something that's become a bit more normal" (CH14).*

Other homes used iPad broadcasts of online activities, including online music, singing, dance or exercise sessions from providers who had switched to online provision:

> *"We have also introduced other people on Zoom that help us out, it was the choir. We have just joined a choir through Zoom, and we met them for the first time out of Zoom just last week. But it will still resume as Zoom because some of our residents can't go to the choir" (CH4).*

> *"For example, if we didn't have the iPads we wouldn't have connected with the college, the community choir and they would have missed out on that opportunity. If we didn't have them, we wouldn't have had the opportunity…The exercise class" (CH4).*

The devices also assisted care staff and management with routine administrative aspects of their work. Reported purposes included daily notetaking, paperwork, staff training and development through video calls or online training sessions, maintaining residents' files to inform management, often through using apps such as Log My Care. The iPads were also used to support care planning and reviews as well as to facilitate online meetings between staff, further reducing face-to-face contact among staff members:

> *"But the care staff have…can use them as well for contributing to care planning and reviews. They can be used for training. And they can be used for meetings between staff. They can be used for review meetings. I've seen them used in that way where you've got the resident and the senior member of a care team doing a review meeting with a family and then they've done it online if they either can't, or whatever, you know, come, and meet the…definitely they use them for that purpose as well" (CH6).*

No significant issues were reported in terms of receiving the devices after making a request. Larger homes requested additional devices stating that the extra devices would help care home staff become more efficient in their use while improving the options available to the residents. On two occasions fewer iPads were received than requested, while interviewees often reported that additional iPads had been purchased to cover the increased needs:

"Yes, we got some, we bought two ourselves. We got the additional ones, because it was so popular, we bought two that we have got as well. Because there are nearly 60 residents here on two different floors, so some are up and some are down so that you are not having to run about looking for iPads and they are always on charged." (CH4).

As a result, CRSCH enabled many homes to trial devices without requiring any initial investment, providing the impetus to further invest in technology.

Participants' perceptions of additional training needs varied across care homes, some participants reported having no issues, as sufficient training and guidance had been provided, while the technology was easy for them to grasp:

"Yes, it was really easy to implement, so there were instructions, there was clear communication, the actual technology was easy to use. We had the iPad, we had the charger, we had the MiFi. We don't need anything else. So, we were given the tools, good quality tools as well, of course, you know. And, yeah, we couldn't have asked for anymore because there is no more that we require; we didn't need somebody to come in and say, right, this is how you work an iPad because we know how to do it. I had never dealt with a MiFi booster before, the data thing, but that was really easy to use, I mean there were no issues with that at all. So, no, it was great – we couldn't have asked for anymore, to be quite honest" (CH3).

However, in their recommendations for future improvement, other participants highlighted the need for additional training:

"But I think I would maybe make sure that the staff had better training, and it would have benefited me if I had better training as well" (CH12).

For some participants, the need for training went beyond the fundamental aspects of using an iPad, as they were interested in gathering ideas about other activities in the care home:

"Maybe like more kind of ideas on like…I know that I gave ideas of how we use it with the residents but when I first started maybe using iPads was a very daunting thing and maybe having like ideas from the staff's perspective, how they use it with residents and how we can make it more accessible to them" (CH1).

High workloads during the pandemic also meant that attending sessions at scheduled at times could be inconvenient for staff members:

"It's just unfortunate that the time of the training, we were obviously in the middle of a pandemic, so it was very difficult to join on the training courses, you know. Because obviously we had to be in the forefront with the residents was the priority" (CH5).

A participant suggested that it would be helpful to know the ways in which other care homes have used the iPads:

"There's maybe things we could be doing more with it, so maybe it would be nice to know how other people use it, and maybe there's things that we're not doing that we could be benefiting" (CH16).

Another suggestion was the provision of a newsletter with ideas on use, such as addressing accessibility needs:

"I think the thing that would be helpful is maybe not even so much as Zoom or something like that, maybe a newsletter or something coming out twice a year just saying different ways that people are using the iPad, ways that we might not have thought of using it or maybe apps that are really relevant to what we're doing in the care home. Like the gentleman that's got the hearing problem, I didn't know about that app, and I could put it on there and that might be of benefit to somebody else" (CH2).

Views regarding training therefore varied, but what interviews did show was the need for accessible training which covered both the practicalities of iPad use, including integrating them into their working practices, and provided inspiration about some of the wider potential of the technology.

5.3.3 Value proposition

The programme presented numerous benefits for residents, their families and for the care homes. Firstly, for residents, the benefits were multi-faceted. The main benefit was the opportunity to maintain communication with their families, particularly during strict measures due to the pandemic:

"It was a good idea, because obviously, they were stuck in their rooms for…due to isolation, and they had no contact with their loved ones, and they found it hard. And it was great to get these tablets, so they could actually contact their loved ones out" (CH13).

Further, residents derived enjoyment, maintained physical activity and social activity within and beyond the care home environment, enjoyed new options for entertainment and experienced improved mood and positive emotions:

"So, with a one to one, if there's someone that's maybe having a hard day, we can take the iPad to them and sit with them and play music, show them pictures, reminisce with them, which is great, because you actually can do it and let them slide the screen and touch the buttons, and it's amazing, amazing how they love that. They always still want to learn, and in a one to one, that's really, really important" (CH10).

There is evidence from proxy accounts of residents for improvements in mood, relief from anxiety, and improved communication with the care providers. When speaking to residents directly in deep dive visits, we did find that several residents could not clearly recall using the iPads. This is unsurprising given the introduction of the iPads was over 12 months earlier. In DDCH1, several residents could not recall using the technology until the activities coordinator reminded them of some recent events where they had used them, such as the Jubilee, or when they had used them to watch YouTube videos with animals. Participants appeared to respond positively to these reminders, showing that they had enjoyed these activities, however, it was clear that continual support was required for them to engage with the technology:

"So, the person that I'm thinking of would use the iPad to do Google maps to go and look at places that are familiar to them. That's somebody who can sometimes become quite anxious. So, by looking at these familiar places, her anxiety lessens and then she's in a calmer frame of mind to be able to, sort of, speak to us. The iPad, the photos will calm her down, increase her happiness, so, that then, she's more able to have a conversation and talk about things that were important to her and from there, we can talk about wider things" (CH11).

The initial hesitation was replaced by the willingness to learn how to use the devices based on their individual interests:

"It's quite mind-blowing to them, but it's good. It's really good. It's easy access, and it's quick. They can save their work or delete their work or whatever they like to do. The quiz apps are really handy…it gives this resident a, kind of, sense of accomplishment that she's doing something new, she's learned something new, and she really enjoys it" (CH15).

The ability to see and interact with their loved ones also benefited relatives. Staff members sometimes sent updates and pictures to relatives, which was reassuring and helpful during lock down and self-isolation periods:

"It also helps, especially in the pandemic when there wasn't so much visiting. You could take pictures and show it to family members or email it to them to let them see what activity

they were taking part in. So, it helped put their minds at rest, that they were actually still, you know, able to do things, and they looked settled and happy when they couldn't see them so much" (CH16).

After the lockdown periods, relatives might still face barriers to in-person visits, such as living a long distance away from the care home, or being ill with COVID-19 themselves:

"Keeping in touch with their families. I mean it's the most important and also for the family member. Look, we have someone just now who's not very well and the daughter has got COVID so she can't come down, so that iPad is sitting in his room just now and he's talking to her so they're seeing each other. The daughter was down a lot. I mean she's a faithful visitor so she's feeling it because she was supposed to be taking her dad out but she sees that he's getting looked after and she knows that she's got COVID so she can't come near so that helps. There are an awful lot of benefits" (CH17).

The iPads also helped staff organise their work and offered a tool which gave them new options to engage with the residents and facilitate activities:

"It's meant a lot to us as well, so it's lifted our spirits when you see a resident talking to their family member, you know. It's not been an easy two years for any of us working in care homes and to see a son or a daughter speaking to their mum and their smiling or they're crying with joy – that makes us feel good as well and actually helps us" (CH3).

Participants reported positive emotions and fulfilment when they watched the residents engage with the devices in beneficial ways.

5.3.4 Adopters

The interviews and deep dive workshops provided evidence regarding the process of adoption and the groups of people involved in it. Further, the data were analysed to help identify how important training was for each care home, as well as the facilitators and barriers in the adoption and implementation of the programme.

Staff

In practice the introduction and adoption of the iPads involved a wide range of care home staff from across each individual care home rather than identified 'digital champions.' Interviewees were asked whether a digital champion had been assigned inside the care home, what their role was in supporting the programme, and whether they had engaged with the training and resources provided to digital

champions. Staff turnover was high, particularly during the pandemic, meaning that often, the digital champions were no longer working in the care homes:

> *"Well, I'm not sure because I started in November and the iPads were already here. So, I don't know. It might have been the activities coordinator before me that had the training" (CH11).*

On several occasions, there was no assigned digital champion, and the responsibility for the implementation of the programme was shared among staff:

> *"No, not one in particular. We found different residents have different relationships with staff members. So, it would…it was always better to choose the person that has a better relationship with that resident and their relatives that they're communicating with. And then that person would be, kind of, their link, rather than just one person to oversee it all" (CH14).*

There were members of staff who were knowledgeable in the use of iPads, therefore supported their co-workers as well. These staff members were frequently reported to be of younger age, with the assumption that they therefore would be more familiar and comfortable with the technology:

> *"This one. Nice young brain that could use the technology. Old brain still learning…She had knowledge of iPads and things like that. She was in a position that she could set things up" (CH4).*

Only in a few cases did the interviewee indicate a specific Digital Champion who had received the training:

> *"I would have to phone DC, the one that went for the training and that, and ask her how we could solve it. But she's usually quite good at solving things. But the staff themselves in here wouldn't be able to solve anything, I don't think so, we'd have to ask for advice. And it's usually DC that gives us…she's good with iPads, because she helped set it up and everything" (CH12).*

Sometimes training did not appear to be important as many staff members, already familiar with iPads, were largely able to adopt the technology without significant challenges. It was repeatedly reported that staff members and managers had learnt more about the use of technology and the options available to them after using them through the programme:

"(R1) Yes, maybe put more apps on them and things. It is all a learning curve and putting things on to the iPad because you can actually put things on now. So, we are just experimenting with what we can use and what we can't use. Everything is a challenge every time, it just gives you more knowledge.

"(R2) Every day is a different day and not every day is the same. There is always a challenge every day, it doesn't matter what happens, there always…

(R1) And we are always learning.

(R2) Yes, and we learn from that as well, yes" (CH4).

The role of family and friends was quite limited in terms of facilitating the adoption of the technology. Due to the restrictions initially in place, they were not allowed to visit the care homes, which meant that their main contribution was to request video calls, and be patient and supportive throughout these calls:

"The family will then phone us and say the time they'd like to do a Skype call…

And the families are very, very good as well, so if a family, for example, was on a call and say the signal was cutting out or their mother or father, mainly their mother, couldn't hear them they would just call the care home and just say, look, can you nip through to the dining room, Mum's not hearing what I'm saying. So, yeah, it was a combination of those items, I would suggest" (CH3).

Video calls were most often organised via a pre-arranged and formalised schedule of appointments, with relatives booking set times and durations to speak to residents. A member of the care home staff typically would have to accompany the resident making/receiving the call, although there were a few cases where residents made calls without or with minimal assistance from the staff. Maintaining this schedule was important if as many relatives were to speak to residents as possible, while ensuring that staff supported the calls:

"So, people tended…the families tended to set up favourite days, favourite times. So, there were a lot of families did it regularly, and it would be Friday, two o'clock, or a Wednesday, 3:30, or whatever, you know? So, quite a lot of families have a set time that they did every week. Other families, sometimes they would do two a week, two shorter, you know, calls or sessions" (CH6).

However, there were reports from staff members that family members may have fewer formal expectations about making video calls. For example, relatives caused issues for the staff by not being punctual in starting or finishing the scheduled video calls:

> *"We had, which comes into the difficulties, was that sometimes family members didn't stick to the times. So, we'd be sitting at two o'clock waiting for the invite, or whatever, or trying to connect with them and they would be late, or they forgot, or they didn't appreciate that we had to stick to these times, and they'd be ten or 15 minutes late. But by the time you set it up and if there were hearing issues by the time you got the resident comfortable it could easily be half an hour on from that time. So, then they would only have half an hour and you'd be going back and saying, I need it for someone else. So, you know, there were other issues that could make it difficult" (CH6).*

The need to schedule and organise appointments, then manage them alongside their other duties could be demanding. In some cases, high demand for the iPads and/or activities on them meant that staff often had to interrupt an activity or video call to use the iPad for a different task that had been scheduled:

> *"Probably there's more people wanting to do video calls. One of the challenges in that actually is that when somebody's speaking to their family, they're time restricted, because we have to deal with other people, so if they want to have a chat with their family, it's going to be difficult to say to them, you know, you can only speak for five or ten minutes, because we need to move to the next person. Sometimes they've not seen their family for months and they want to sit and talk to them for a long time, and that'll be one challenge that we'll face" (CH10).*

The higher the level of adoption within a care home the more prevalent this problem became. Having more available to cover their residents, particularly as their use grew was a sign of success in the programme but did cause issues for staff workloads, which needed management.

Residents

For residents, there were several facilitators which positively influenced the technology adoption process. Firstly, many residents were already experienced with tablets, computers, smartphones, or other technologies. Such technologies are well established; indeed, several residents had their own technology.

> *"We do have other residents; we have I think three residents who have their own iPads, and they obviously use them. Don't get me wrong, they lose their emails, and the staff go*

in and fix them...And a lot of the residents have got iPhones as well because the family 'phone through FaceTime to them. But they need a bit of support now and again and the team are quite good at going up and supporting, fixing out their emails where they've lost them and showing them the pictures of the family" (CH5).

While many residents chose not to engage with the technology, we did see cases where upon exposure to the technology, many residents who claimed to have no interest in the technology started to engage. In DDCH2, residents 203 and 204 were exposed to an iPad and its main functionality for the first time during our visit. They initially expressed their hesitation to use the technology, reported that they had no prior knowledge or experience, and explained that they had lived most of their lives without such devices. We then asked them about their interests and presented them with information, images, and videos on the iPad, explaining that with some support from the staff they could have access to such content any time they wished. We then made a videocall with a member of our team and gave the residents time to engage in a conversation through the iPad. The residents viewed the device as potentially valuable to them by the end of the session, and already had some ideas of what they could do with it. They appeared pleasantly surprised with the realisation of what they may be able to do with the technology. However, throughout our session the residents repeatedly expressed a lack of confidence in the possibility of using the device on their own. Surprisingly, some technologically savvy residents who had been using tablets for an extended period of time also reported an underlying fear that they might "press the wrong buttons" and cause unintended outcomes or damage to the devices.

The most prevalent facilitator was the provision of support from staff. Staff initially had to judge resident's interest, persuade them to engage then build their confidence. Residents were usually accompanied in some form by a care staff member when using the tablets. During video calls, staff members were often present, started and ended calls and helped facilitate the conversation between the resident and their friends or relatives. Depending on their needs, residents either received continuous support while using the iPad or were allowed to use them independently after the staff member started the call:

"You need to be there at the start and set them up, and once they start talking, you can go away and leave them, give them a wee bit privacy. They're fine. As I say, they have adapted really, really well to it" (CH17).

"And they can have privacy. They can go in their room and close the door and have privacy to speak to someone" (CH14).

Staff would be responsible for the background elements of using the iPads, such as making sure they were connected to a Wi-Fi network, reconnecting Bluetooth connections if they failed or making sure they were correctly charged and stored between use. Support also took the form of providing instructions and guidance, offering help setting up, using the iPad with the resident, and making adjustments to mitigate accessibility issues. Staff would adjust the volume for residents with hearing impairments, connect an iPad to a larger screen for residents with visual impairments, hold the iPad or use other items or accessories to mitigate motor or cognitive impairment.

Several barriers during the adoption process were identified. Firstly, despite tablets now being a largely accepted and familiar technology, residents initially faced difficulties in using what in many cases remained unfamiliar technologies to them:

> *"I think that was the challenge at first, it was the actual resident, they weren't actually too sure, know what I mean, of what was happening, why they were on this device, know what I mean, contacting me. So, I think that was the challenge at first, but then, when they get used to it, it became a bit understanding for them, sort of thing. And once the carer could explain things to them, what was happening in the world, then they began to understand why we had to go through this way of contact" (CH13).*

While some residents were familiar with iPads, owning their own tablets, many residents often hesitated or were confused by the new technology:

> *"I've found the technology can be quite confusing for them. And actually, you know, understanding when there's somebody on a screen speaking to them, that can be quite confusing. And others, you know, others had used it pre coming into the care home, so those that have had previous experience of using iPads and technology, it worked really quite well because they were familiar with it. But with the age group that we have here, predominantly sort of 80 plus, they're not necessarily used to using technology in the way that maybe you and I use it on a daily basis. So, at times it could be confusing" (CH18).*

Accessibility issues were also common. The screen of the iPad could be too small for visually impaired residents:

> *"Maybe bigger screens actually but that's because sometimes if you go into a client's room, and, I mean, iPad screens are quite small, if somebody's got poor eyesight, that can be a problem" (CH11).*

Hearing impairments caused difficulties during the video calls, and motor impairments made it difficult for residents to hold the iPads on their own or use the touch-based screen interface. In DDCH3, we discussed with resident 303 about his difficulty using the touchscreen keyboard of the iPad. The resident reported needing assistance as he could not type the search terms that he intended to. We attempted to use a voice assistant (Siri) with him, which he was more comfortable with, however, he appeared to require significant support using this option as well. Cognitive impairments such as dementia, which were present in all participating care homes, were also associated with difficulties such as short attention span, struggling to interact with the iPad or remembering how the iPad operated, and difficulty recognising faces on the screen or engaging with activities facilitated through the iPads:

> *"Some residents are…you have acute dementias or acute brain injuries where they just don't understand it or they can't register it, but they can still, to some extent, maybe recognise their families or if you can show them pictures of their families or photographs or video, FaceTime, video messaging, something like that, they can benefit from that. There's certain residents in here that are just…wouldn't be able to press the buttons. They're non-corresponding, you know what I mean, they wouldn't be able to speak to you" (CH10).*

Few of the interviewees mentioned being aware of the accessibility settings built into the technology, and therefore had not explored how these could be used to make the iPads easier for them to use, indicating that this is an area for further potential tr

There were also cases where staff felt that, for at least some residents, the technology was inappropriate, and therefore did not try using it with them, or stopped their use:

> *"Although, I mean at the start of it, the residents couldn't really come to terms with how that person was talking to them in a TV. It, kind of, frightened the residents at the start. One in particular thought she was talking to herself, and it was her daughter" (CH17).*

In DDCH4, the lead wellbeing coordinator expressed the view that for a small number of residents with dementia, videocalls were not a suitable way of communicating with their relatives. These residents had a difficulty comprehending the process of a videocall, could not understand why the person was not in the room which them, or could not recognise the person on the screen. While rare, such cases could cause distress to both parties if the resident realised that their relatives were not physically present in the room, or if they could not understand what was happening. After making a

few attempts to support them, the wellbeing coordinator had concluded that there were cases where the challenges outweighed the benefits.

5.3.5 Organisations

The staff roles involved in the implementation of the programme crossed over most staff roles in care homes, and included activities coordinators, care officers, carers, wellbeing coordinators, managers, and directors. One of the participants was the director of a company running four participating care homes. Their direct interaction with care home residents constituted 20% of their working time. Without having personal care responsibilities, the director would see residents daily while going through the buildings, performing various checks, and getting involved in activities. Managers of care homes had a range of responsibilities related to overseeing the smooth function of the care homes and making strategic and operational decisions daily. Managers would spend from 20 to 50% of their working time interacting directly with the residents. Care officers, activities coordinators and wellbeing coordinators were more heavily involved with direct interaction with residents. Depending on their background and the needs of each care home, they might provide personal care but in most cases the participants participated in organising and facilitating activities during the day and supporting the wellbeing of the residents. This group of staff members spent approximately 80% of the day directly interacting with residents. The remainder of their time was dedicated to administrative responsibilities.

In the daily implementation of the programme, most of the activities and video-calls involving the iPads were facilitated by wellbeing coordinators and activities coordinators:

> *"So mainly it's just like me as activity coordinator and also there's another activity coordinator. We are just kind of the persons who engage but also maybe the carers who are on shift if they're doing video calls because they'll know the families a wee bit better, so they get to kind of join in the video call with the resident" (CH1).*

Although it was repeatedly reported that more than one member of staff used the iPads, the variety of activities relied on the skills and creativity of the activities and wellbeing coordinators, who also had a great deal of autonomy in developing activities. The types of use were not imposed or closely monitored by the management:

> *"Basically, it is the wellbeing coordinators who use the iPads, and they use them the way that they think is best. There isn't really any one particular person within our company that checks whether they are being used to their best effect. They have busy schedules every day and they use them where they can" (Org1).*

The working cultures within each of the care homes played a significant role in influencing the adoption of technology. Managers who were supportive and encouraging, appeared to have a positive impact on staff members' motivation to implement the programme effectively:

> *"And management's very supportive. M., she's our home manager, she's only been here six months, but she's made…she's always been very supportive with the wellbeing team to get more…well, she's delighted with what we do, she's really pleased with our work, but this has opened up another big area for us" (CH10).*

Positive relationships and effective teamwork between staff members were valued by activity and wellbeing coordinators, who were primarily responsible for using the iPads:

> *"(R2) As long as the residents enjoy it and they're happy, that's what we come in every day to do, but a lot of support from the managers, and it's not everywhere else, you've got some carers that are interested and some aren't, but that's just life, you know. But yeah, on the whole, there's a team of us of five, so we kind of bounce off one another, and that's the thing, it's quite good. R1 is good at sourcing outdoor activities. We've all got something that we do.*
>
> *(R1) Everybody brings different ideas to the table, so…" (CH10).*

Most members of staff were reported to be tech-savvy and comfortable using technology, certainly enough to confidently support residents using the devices. While many homes described the responsibility falling on the activities coordinators, several homes also reported a positive culture where the staff members worked together as a team, which also had positive implications for the programme. In such teams, supporting the use of iPads was a collective endeavour, with several staff being involved in using or supporting residents with iPads:

> *"It benefits everybody because it boosts morale as well because we have used it to stop the clock where everybody stops their role and we all come in and we do something that is on the iPad. It could be a dance, it could be a song, it could be a quiz. But we stop the clock, and it changes the mood of everybody. If everybody is uptight, everybody stops. We say, stop the clock, everybody comes in. It doesn't matter if you are cleaners, cooks, management, everybody stops. We stop for 20 minutes; half an hour and we do something with the computer" (CH4).*

We also saw evidence of changing perspectives relating to the use of technology. As the function and value of the iPads became better understood and they became more integrated into the life of the home, many of the wider staff started to see the potential of the technology:

> *"I think probably everybody was very sceptical and wary of them and not wanting to go anywhere near the iPads, that'll be for the nurses or whoever but now I think people have built up their confidence and they're far more comfortable with taking the iPads away for using for...even for quizzes and things like that, they'll use it for that or getting music on for the residents. Yes, I think carers' confidence has gone up using it and maybe it's because they've had to use it at home as well on their phones that their confidence has grown as well" (CH2).*

> *"I think it has changed. I think it's become more of a tool for our daily working and that it's not a hindrance it's more like accepting this device can actually help us in our role. I think it's made a very big improvement on my role and also for the residents" (CH1).*

It was also clear that the iPads had an impact on wider work in the care homes, not least in providing an impetus towards a shift in adopting digital forms of care activity. There were many cases recorded in which devices became important tools for administrative tasks such as emails and maintaining records about the residents. These jobs were made easier for staff who were competent in using the devices. The higher the adoption and integration of the technology within the daily lives of the residents, the more evident it was that staff used the devices for other types of work as well. Many care homes and staff used iPads as part of a shift from paper to digital records. Several homes, or staff members still relied largely on paper-based recording, for some staff the freely provided iPads formed part of a movement towards more digital ways of working. Some staff did this themselves, moving their own personal records from paper to digital. For example, activity and wellbeing coordinators used iPads to maintain their own notes and records of residents, including life stories and interests, which could be used when developing personalised activities for the residents.

Infrastructure in care homes could pose a barrier. Most care homes appeared to be Wi-Fi enabled, but interruptions in the Wi-Fi connection were disruptive particularly during the time when video calls were more frequent. Many homes were unsuitable for the installation of a widespread Wi-Fi network, meaning that there was great variability in how reliable the Internet connection was, as well as variation between different rooms or 'blind spots' with no signal:

> *"I think the charging things like that are okay, but I think maybe the Wi-Fi, our Wi-Fi is not as good so sometimes we take it into resident's rooms and the internet just cuts off. In*

certain places there's a wee bit of a kind of blind spot for the internet that's the only thing that really is a kind of hindrance sometimes for using iPads" (CH1).

The infrastructure of the home was important in facilitating adoption. Care homes with reliable Wi-Fi connections appeared to gain more from the benefits of the program. MiFi devices as well as upgrades of the Wi-Fi connection were reported to help with previous connection issues:

"The Wi-Fi was quite challenging before COVID, but because of the need for iPads and suchlike, we have had the Wi-Fi…it's progressed a lot. And we've got hotspots around the home now, so there's pretty much nowhere in the home that you cannot get Wi-Fi, which is really handy" (CH15).

Positive culture towards technology as well as the presence of technologically literate staff members helped accelerate adoption, as tech-savvy individuals were able to support staff and residents. They were reported to be a younger age in most cases:

"Well, I think you have to have somebody that's knowledgeable to set it all up, somebody maybe younger than me, definitely. And then you have to communicate that it's there, so that people are aware. And then you have to, you know, teach people what you can actually do with it. And then you have to, sort of, make sure that it is in use and really just, you know, show people the benefits of them, and show them what can be done. I think it would be quite easy just for it to arrive and nobody know what to do with it, and it's just not linked up properly, and then it wouldn't work. But I think you need somebody to make sure that it's getting communicated, the benefits" (CH16).

5.3.6 The Wider System

We looked at the role of organisations within the wider care home system, including the Scottish Government, SCVO, DHI and the wider body of statutory organisations (e.g., the Care Inspectorate) who were supporting the programme. During the stakeholder workshop, we identified key policy objectives of the programme, their links with wider policy objectives, as well as the extent to which they have been successfully pursued until this point. The main policy objective of stakeholders was to reduce social isolation and loneliness and enhance social connectedness of care home residents particularly during the pandemic. Further, the programme aimed towards the digital inclusion of care homes and the engagement of staff in digital opportunities. These were in line with the objectives of 'Connecting Scotland,' with DHI's strategy and ambitions, and with the Scottish Government's broader commitment to digital inclusion, to widening access to digital care, and mitigating the impact of the pandemic. The broader policy objectives are reflected in the Independent Review of Adult Social Care

as well as the establishment of the National Care Service. According to the workshop data, stakeholders' policy objectives were met to a considerable extent. Progress was made in terms of digital health and care objectives, care homes engaged, and residents staying connected with their families during the pandemic. Furthermore, goals for the project also included addressing the digital skills agenda, with valuable insights being gained from the challenges faced when implementing a digital skills training programme. In addition, the fragmented nature of the residential care sector was identified as having important implications for rolling out programmes like the CRSCH, particularly in relation to accessing the training element made available alongside the iPads. Such knowledge is expected to inform the next steps in the development of the programme.

To identify their connection with the wider system, we asked care home staff about their relationship with stakeholders supporting the programme, how they found out about the programme, and whether tablets were used to connect to other care services. Many participants reported that their care homes were informed about the programme and decided to apply after being notified via emails, or in some cases telephone calls by members of SCVO. Interviewees could often recall their initial correspondence and application, as well as the time that the iPads were received, which was usually during the second lockdown period, commencing in December 2020:

> *"From memory I think it was an email that came through in effect asking us if we would like to apply for a free iPad with data for our residents for connectivity during the first lockdown, I think it was. And we applied, were successful and then invited to apply again. We did and got a second iPad which was great, really, really good" (CH3).*

Participants who were not managers would normally find out about the programme through the managers indirectly and might not recall how and when the care home initially participated in the programme:

> *"Now that's…I am not absolutely sure because it didn't come directly through me. I think it would have gone through our manager, the home manager" (CH6).*

Formal feedback regarding the programme was very positive. It was pointed out that the iPads were provided at a crucial time for the care homes, and this was appreciated by all participants:

> *"I think the value was that there were other people helping us. So, during lockdown a lot of time it felt as if we were just on our own. So, when we were getting iPads and when we were getting the data it genuinely felt that people were…government, whoever, they knew we were here. They knew our residents were here and they were wanting to help. And we're a stand-alone single charity so for us the fact that we could have this technology at*

no cost to the charity was a Godsend to be quite honest. So, it made us feel as if, right, we're not being forgotten about" (CH3).

There was a general sense of gratitude towards the programme, which was expressed to us on several occasions:

"The experience that we had with the Connecting Scotland as a project, as an organisation or whatever, has been exceptional. A hundred out of a hundred – there were no faults, it was exceptional, absolutely exceptional. There is nothing you can say against the project, it's an exceptional project that delivers" (CH3).

However, there was sufficient evidence to suggest that care homes only had limited engagement with the various training offers, newsletters and information available through TEC Scotland:

"The programme, as I say, we didn't get involved in anything other than really taking delivery of the iPads and setting them up and using them" (Org1).

There appeared to be lack of sufficient communication regarding the training which was available:

"I didn't know about the training. So, I'd probably have made…'cause I quite like things like that. I would have probably put more of an emphasis on that for the staff if that had been…if I'd known about that at the time. But that would be the only thing" (CH14).

In some cases, staff turnover was the reason why the interviewees who participated in the use of the iPads were not aware of the training available:

"So it was actually…it was put into place long before I started in post. In this home. So I didn't actually personally have any input at all for it" (CH20).

I: Did you have a digital champion in your care home?

R: So, I think, the lady who set us up on this, and who was taking that role, has now left.

I: I see.

R: So, yes, we did have, but as I say, she's not really been here for the last six months. So, but I suppose, we've just carried on any work that we had put in place from that, where possible.

I: Are you aware, I know it's a different person and it's been a while, but are you aware if she took the training or not, back in the day?

R: I'm not sure, I'm not sure, yeah.

I: But have you, or anyone else, accessed the training that is available?

R: No, we've not, no.

I: So you've been managing on your own, using the iPads?

R: Yes" (CH18).

The above quotes also indicated a lack of communication within each care home, regarding the training and resources available. In some care homes, the members of staff who participated in implementing the programme, did not seek training because they did not consider it necessary:

"R: We had a member of...well, to be honest with you, most of our staff are young, so most of the staff all knew how to operate the iPads. So, I think it was the youngest that were on duty.

I: I see. So, did they receive any form of training as digital champions from the programme itself?

R: No, they didn't receive any training" (CH5).

The above quotes highlight a gap between the benefits sought by key stakeholders involved in the programme, and the experience and outcomes in this area. In the stakeholder workshop, participants mentioned that the programme aimed to foster and maintain relationships with care home staff, by setting up learning and support forums. However, there appeared to be challenges in establishing such connections, as communication was time consuming, and the availability of staff to attend training was limited. The latter challenges were identified both by interview participants and stakeholders.

By comparing the discussions, we had with stakeholders and staff members, there appeared to be a mutual understanding of several challenges and facilitators regarding the programme. While iPads were generally accepted, a small number of staff members mentioned that they would have preferred the option of choosing devices other than iPads for compatibility reasons. Stakeholders mentioned that this was among their original goals but was not feasible in practice due to supply issues. Such options can be present in the programme moving forward. Both stakeholders and staff members recognised the challenges faced in terms of overcoming initial reluctance among staff and residents to use the technology, building the confidence of staff, issues with staff capacity, the process of the initial set up of the devices, as well as issues with connectivity. A challenge identified by stakeholders and not acknowledged by staff, was the issue of cyber-security and data protection of residents;

training in data security was available, but no care homes discussed taking this training up. Future training sessions could place emphasis on informing staff about risks and best practices in this area. Stakeholders were asked to comment on changes required at the level of individual sites and organisations. The latter included offering a variety of devices to allow choice, providing more resources in general, and improving and widening the focus on communications.

5.3.7 Embedding and adaptation over time

The data were analysed to understand the development of the programme from the beginning until the present time, and its potential to continue moving forward. It was repeatedly reported that the iPads were received at the time when they were necessary to maintain social connectedness and overall wellbeing of care home residents. Switching from in person visits to video calls was among the many adaptations that care homes were forced to make in response to the pandemic, its subsequent enforced restrictions, and occasional outbreaks within the facilities:

> *"Because it was originally from the pandemic so that families could get in touch via the iPads, especially for the ones that were in their bedrooms, they could FaceTime their families" CH12).*

Since the iPads were first received, the video calls were reduced, which in some cases meant that the use of the iPads was reduced overall:

> *"They're not being used nearly so much by the residents now, because the visitors are getting to come in. The visitors can come in, their relatives can come into the home now, so the residents are not using them very much now" (CH8).*

As familiarity with the technology among staff, management and residents increased, latest ideas emerged on how the iPads could be used and a new use case was developed, upon which continued use of the iPads could be based. As a result of these changes, in many cases participants reported no actual reduction in their use over time:

> *"I don't think so actually because…maybe slightly less Skype calls because more of those people are able to come in, but there are a lot of relatives who are not able to come in because of their own health or live in England and live further away. And it's just become the norm to do Skype calls for them. So, I think the iPads really are still used just about as much. And even the people that do visit regularly, when we're able to take pictures and videos of things, we just send it to them anyway. So, they're getting, like, a constant update of what their…what's going on" (CH14).*

When predicting future developments, many participants reported that they expected to maintain use of the iPads, including new ideas for activities, as well as continued use for video calls when necessary. In such cases, staff members who engaged with devices saw their value and wanted to continue finding new ways to use them, in keeping with the residents' needs.

There were examples where the technology had been abandoned as the original use case declined, with iPads either being unused and put in cupboards, or only used occasionally. In such homes there was limited enthusiasm for the technology among either residents or staff. However, these were rare in our sample. Only on one occasion did a participant actively express the opinion that there had only been a temporary need for them, which had now been met and the iPads were no longer necessary:

"Yes, gradual decrease in use…Seems to have run its course" (CH7).

There was a clear drop off in the iPads primary use to support video calls, which is unsurprising given the lessening of social distancing restrictions. Furthermore, no homes saw video calls as a replacement for human contact, and none of the homes wanted to prioritise video contact over face-to-face contact as a new normal. Therefore, in most homes the iPads became embedded in the wider activities of the home. The tendency to adopt new technology with an emphasis on improving accessibility was evident in DDCH3 and DDCH4. These care homes had introduced a larger tablet, Sharp's 'Interactive Touchscreen Table,' which combines the functionality of a tablet with the advantages of a larger screen. iPads were preferred for individual use, while the table-sized tablet was used in communal areas for group activities such as karaoke and fitness classes. DDCH4 had also introduced VR technology, to allow residents with limited mobility to go for virtual 'walks' and explore multiple virtual spaces while remaining in their rooms. Staff now viewed the iPads as part of the wider repertoire of resources available in the care of their residents.

6. Discussion & Recommendations

Drawing on the NASSS framework, the goal of this evaluation was to explore the implementation and delivery of the CRSCH, in which its success (or not) involves drivers from across the whole system of devices, stakeholders, policymakers, national organisations, local organisations and services involved in its delivery. Our results suggest that the CRSCH programme was broadly successful, having numerous positive impacts for residents, for their relatives, and for care home staff and organisations. The quantitative and qualitative findings of this report reveal that the provision of iPads made significant positive differences to residents, by both connecting residents to their families and friends, and later by providing a wider range of other social and cultural activities in the home. Clear benefits for staff were also recorded, as the iPads enhanced their roles by improving their ability to work with and support the residents, and by streamlining administrative activities in the home.

These broader benefits were achieved through the endeavours of care home staff to use the provided iPads in often highly creative and innovative ways. An exemplar of this creative engagement occurred during our first deep dive care home workshop (DDCH1), where an activities coordinator for older people (103) told us about a reminiscence activity session they had organised. Residents were given a range of chocolate bars. Videos of old advertisements for each chocolate bar were found on YouTube and played to the group of residents, streamed from an iPad to a large television in a common room. Residents ate the chocolate bars while watching the adverts, talking, and laughing with each other at the adverts and the memories the adverts (and the chocolate) triggered.

What this example also demonstrates is some of the multi-faceted elements of what may on the surface appear to be a simple intervention. First, this example demonstrates how far beyond the original perceived use case that the technologies were being used. The example show technologies could be used in highly creative, person-centred ways to promote enjoyment among residents. This creative adaptation and reappropriation or 'bricolage' is common in technology-based interventions, with users frequently creatively adapting technology far beyond their original purpose (Greenhalgh *et al.* 2013; Gibson *et al.* 2019). Second, it also shows the increasingly complex arrangements of multiple technologies that were used to engage residents. This case alone involved four different technological elements (the iPad, YouTube, a large screen TV and a Bluetooth connection between the iPad and TV) all coming together to provide a new, technology mediated but deeply person-centred care activity. This example illustrates the opportunities that the iPads gave to care staff or their benefits to residents, but also some of the requirements and arrangements that contributed to the programme's overall success. Understanding the nature of this work, and supporting staff in engaging in it, is critical to understanding CRSCH's success.

In this concluding section of the report, we will summarise the main points for learning and provide recommendations regarding the programme's continuation. We will also summarise some of the limitations of our evaluation approach, which should be accounted for when drawing upon these findings.

6.1 Benefits of the CRSCH programme.

The CRSCH programme was set up during an acute and long-term period of social isolation, caused by the COVID-19 pandemic, and the social distancing restrictions required to curtail its spread. As noted earlier in this report, the pandemic has not ended for Scotland's care homes. The original use case for the iPads was providing a means for videocalls between staff and residents. This need has declined since the height of the pandemic, but it has certainly not ended. Indeed, this case continues to be made; both due to COVID-19's endemic stage and due to the increased role of videocalls in health and social care. Based on this alone, the iPads should continue to contribute to care home life, both in the short and long-term.

We have not quantified the level at which iPads led to measurable outcomes among residents, largely because this would be impossible in an evaluation conducted over a year after the initial COVID-19 lockdowns and introduction of the programme. Many staff have left their employment since the programme started, and sadly many of the residents who benefited from the programme have passed away in the period between the programme being introduced and the evaluation. Therefore, our evaluation relies on staff reflections on their use, with a more limited number of reflections from residents. However, from these reflections, it was clear that benefits of the programme could be identified for residents and for care home staff across a variety of roles. We summarise these benefits below.

6.1.1 Benefits of the CRSCH for Residents

For residents, the iPads provided opportunities for continued social interaction with their family members during acute and prolonged periods of loneliness and social distress. This was highly valued in the most acute phases of isolation, and while the iPads were no replacement for face-to-face contact, they did make an appreciable difference to the isolation being experienced by residents. Less noteworthy but still of importance, the iPads helped alleviate the prolonged periods of boredom that became a feature of care homes, especially as their usual programmes of visitors, events and activities stopped. They also gave a means for at least some of these activities to continue, albeit online rather than in person. Such benefits were imperative for residents who in the first lockdown, when restrictions were tighter and CRSCH had not yet been launched, had been 'slipping away' due to the loss of contact with their loved ones.

While enabling video calls was the primary purpose of CRSCH, we quickly found that the benefits went beyond their videoconferencing functions. Instead, iPads frequently became the focus of a wide range of social activities within, as well as beyond, the care home. They were used for enabling group activities via videoconferencing platforms, including exercise, yoga or tai chi classes, reminiscence, or other creative sessions, and enabling online access to hospital or GP appointments. Consequently, iPads became a vital tool in building then sustaining the new digital lives of care homes, which were thrust into prominence by the pandemic.

6.1.2 Benefits of the CRSCH for staff

The iPads gave care home staff a means to do something to try to alleviate the isolation, loneliness, and distress that they could see among their residents. For several care homes, provision of the iPads resulted in a significant boost to staff morale; a sense that things were being done to help those whose needs had been neglected since the start of the pandemic. Beyond the effect on morale, iPads gave care staff novel resources and new opportunities to engage with residents, often in highly creative ways, and based on each staff member's knowledge and relationship with their residents. This sometimes had a downside, however, in that it frequently depended on a high level of enthusiasm and confidence towards the technologies, as well as a willingness to put in the work that the technologies required. Unfortunately, not all staff had the willingness, knowledge, or confidence to engage with technology in this way. Finally, it required the rapid development of new ways of working among staff, which did cause issues given the extreme pressures of the pandemic and workload problems it caused. Care homes proved highly adaptable because they saw the value of the programme, however, there were cases where this did not happen, although in our sample they were rare.

6.3 What contributed to the successful adoption of the CRSCH?

Using the NASSS framework, we were able to identify a range of factors across the whole care home system, which influenced the successful adoption of the CRSCH. We summarise these factors as follows.

6.3.1 The condition – social isolation in care homes

The 'condition' or in this case 'the context of the programme' was COVID-19, its impact on care homes, and particularly its impact on degrees of social connectedness, social isolation, and loneliness among care home residents. To understand this impact, it is useful to understand the wider impact of COVID on the care home sector. It is fair to say that the early pandemic was a bleak time for care homes. The care system came close to collapse, and there was a perception that care homes had not received the attention or support they needed during the initial stages of the pandemic. Morale among staff was

low, care was clearly being compromised and residents were deteriorating rapidly as contact with their families disappeared overnight. In this context, for many care staff, the programme had an appreciable effect on all in homes. For staff, it brought about an improvement in morale; that after several difficult months they were getting at least some consideration, attention, and targeted support. Many of the care staff we interviewed expressed thanks to us for the programme. This impact should not be understated; while the programme could not hope to provide the same benefits as regular face-to-face contact, it did at least make things better for their residents. The programme therefore made an appreciable difference to residents.

6.3.2 The technology

In relation to the technology itself, staff found it easy to engage with the devices. This is unsurprising, iPads and tablets are well established and most (but not all) staff members will have at least some familiarity with them. There were occasional difficulties depending on which brands or platforms staff were more familiar: Apple, Android, Zoom, Teams, Skype, Facetime to name but a few, each with their own systems, logins and means of contacting the callee. But they had few difficulties with using the device itself. Residents did not necessarily share this experience. As noted, some residents were familiar with the technology, owning their own tablets and using them independently. In practice, most residents needed some form of accompaniment when using the devices. This should not necessarily be seen as a weakness of the technology, although our findings do suggest that greater attention needs to be paid to the accessibility features designed into devices and the support needs residents have when using them. What was clear was that in-person facilitation from a member of staff, volunteer or another present family member should be seen as a precondition for their use in care home settings. If this could not be put in place, technologies could rapidly fail and be abandoned.

6.3.3 The value proposition

The primary value of CRSCH was its explicit purpose of facilitating video calls, and in this respect, the programme was clearly successful. However, it was also clear that the tablets had much wider value. The iPads had numerous positive use cases and impacts: from Facetiming a grandchild through to listening to music via Spotify, watching cat videos on YouTube, or watching old movies on Netflix. While some uses mirror existing technology (e.g., using Netflix to stream films/TV), they also allowed for a much greater degree of personalisation and choice for residents when compared to existing, communal technologies. iPads functioned as a facilitator for a wide range of other activities, and these are important to recognise when considering if they were successfully implemented. We therefore incorporated these impacts into our evaluation of the programme and would emphasise that they should be considered in any decisions about its future.

6.3.4 The adopters

Among residents, if the iPads were understood to have a clear and compelling purpose that could quickly be demonstrated to a person, they were successful. Video calls were the best expression of this use – most people instantly saw the benefit and indeed joy of being able to see family members they had not seen for many weeks or months, even if through a screen. For residents, the technical or accessibility barriers that they faced could be overcome if there was enthusiasm for the technology, or if they saw it as having a clear benefit. A smaller but substantial number of residents chose, however, not to actively engage with the technology at all, seeing it as irrelevant to their lives. However, we did see cases where staff members were able to overcome this barrier. For example, where residents still took part in the wider activities hosted by the technology (sometimes without their knowledge).

Successful adoption required enthusiastic engagement from care home staff. Most of the staff we interviewed were enthusiastic about the iPads and what they enabled them and their residents to do. This may be an artefact of our sample, as of course we would expect care home staff who were enthusiastic about the technology to be more willing to speak to us. What was also clear was that integrating iPads into staff duties required a lot of extra, often 'hidden' work. A staff member usually accompanied residents when it was used. We also found that their use required a lot of administrative work. Video calls had to pre-arranged, scheduled into a rota and potentially only available if the staff who organised the calls were working that day. Staff needed to research how to use devices effectively, and what they could meaningfully do with them. Such duties created extra administrative demands needing additional time, which was not necessarily accounted for in their working hours or job descriptions.

Staff were generally enthusiastic and engaged with the technology when they saw its inherent value, either for themselves or for their residents. But we found that the work involved usually fell on a few, particularly engaged or enthusiastic, members of staff. Most often the role of supporting residents to use iPads fell on the shoulders of wellbeing and activity coordinators. They were the de-facto digital champions, with many seeing the iPads as a natural extension of their roles. These staff members were very enthusiastic, in some cases almost solely driving adoption. But there were also risks inherent with use being driven by one or two staff members. There was a danger of abandonment of the iPads (or any technology) if the wider staff lacked enthusiasm, resulting in the technology use not being sustainable. For example, in one of the deep dive care homes, the activities coordinator who was employed at the beginning of the pandemic had little familiarity or interest in the technology; the iPads they were given were quickly put in a cupboard and forgotten about. It was only after a newly

employed activities coordinator re-discovered them early in 2022 that they were used again. This experience, not the underlying use case, was one of the primary drivers of abandonment.

6.3.5 The organisation

Organisational factors that influenced the adoption of iPads include the enthusiasm and support from senior management regarding CRSCH, the degree of personnel and technical infrastructure present, and the ability, willingness, and enthusiasm of the organisation to adopt them. The secondary analysis indicates that larger, privately owned care homes with higher numbers of beds and greater degrees of need among their residents, were more likely to engage with the programme. These homes were also more likely to be in the central belt or major cities outside the central belt. This suggests that these homes had both identified higher levels of need among their residents and may also be more likely to have staff in roles which could support residents (e.g., activities or wellbeing coordinators) by virtue of their size. Homes engaging in the programme also had relatively lower quality ratings and higher risk profiles regarding their residents, suggesting that these homes may not have had access to technology prior to COVID-19, may have felt their residents had greater levels of need and/or were more likely to have the staff and infrastructure to enable adoption of the technology.

In contrast, smaller care homes, located in rural areas in the Borders, Highlands and Islands appeared to be less likely to take part in the programme. In addition, care homes in more deprived regions of Scotland were less likely to take part in the programme, regardless of size. Reasons for this difference are unclear. Initial insights suggest that smaller homes or homes in more deprived areas may have been unaware of the programme or may have lacked access to either underlying infrastructure (e.g., inferior quality broadband services), or staff resources (e.g., staff-resident ratios and staff in key roles) to support the programme. In contrast a more positive scenario could be that some smaller homes with higher staff-resident ratios, higher quality ratings and/or lower levels of deprivation may have less need of the programme. Such homes may have put resources in place already or may have residents (or their families) who were able to source the needed technology themselves, and therefore had little need for the extra resources provided by CRSCH. A home not taking part in the programme may have already solved the problem and therefore did not need to engage.

The qualitative data provides invaluable insights regarding what influenced the adoption of the programme by individual care home providers. The attitude of the care home senior management played a significant role in determining the success of the programme. Support from a home's management, or the management of their parent organisation was required. At the level of individual homes, it was clear that activities and wellbeing coordinators were key to the success of the technology. They operated with high degrees of autonomy, with the freedom to develop their own

ideas or activities, using the iPads when doing so. They were often highly creative but sometimes lacked information and support about what they could do with iPads. More generally the role appeared under-resourced, some described struggling to finance or resource their activities; most had little to no budget from their organisations and in some cases had to resort to fundraising for equipment or supplies themselves. Being given an iPad for free provided a spur for their creativity. Given the importance of their role in supporting residents to use iPads, how to better support activities/wellbeing coordinators as a specific job role, including how they engage with technology, is one area where the programme could be expanded in the future.

The introduction of the programme also influenced the digital skills and confidence of many members of staff by helping them in their administrative duties. Some activities coordinators adopted the iPads as their own personal device, using them for administrative duties. For most who did this, having the iPad gave them a valuable tool to provide personalised activities. In some homes, use by staff for administrative functions, became the main driving force for the iPads. This does not necessarily mean the technology was a failure. Instead, its use case had changed, and it had been reappropriated for further benefit of the home. This does raise questions regarding how use of the technologies might be monitored and evaluated over time, by homes and by the programme.

The degree and quality of the technical infrastructure in care homes also influenced the success of the programme. High quality internet provision should be seen as a necessity within care homes. A few homes needed the Mi-Fi mobile Wi-Fi hotspots to function, although these were in the minority. Few homes had no broadband infrastructure at all, even if it was used for administrative purposes. Many homes were already digitally engaged and for these homes, the programme led to more incremental changes. The programme was valued for enabling them to do more, and to further embed their existing activities using the new technology. There were also care homes who, inspired by their success with the iPads, now wanted to expand their technology offerings. However, we did not see evidence to suggest that care homes were discussing the greater introduction of technology more formally, for example, their place within asset management registers or planned investments in technology.

Uptake of the programme by care homes is therefore a complex issue that is difficult to interpret, and our evaluation is unable to give a clear answer for why some homes chose not to engage in the programme. It is likely that both scenarios mentioned earlier in this section are present – our qualitative work suggested many homes needed support, but others indeed had identified the need and introduced the technology themselves. In any plans to expand the programme, identifying the reasons why those care homes did not take part would be of great importance. Our findings do,

however, suggest that uptake was less in smaller homes, in more deprived areas and in the rural regions of Scotland, and these areas should therefore be specifically targeted in any future iterations of the programme.

6.3.6 The Wider System

The stakeholder workshop provided some indications of what may be required across the wider residential care system to support greater adoption of the CRSCH in care homes. These include how best to provide ongoing support and training, what models of support should be offered, and how technology should be supported more widely within social care policy. The fragmented care home landscape means that the question of how to best support care homes in developing their technology offers, and the mechanisms through which this support might be provided, is complex.

What mechanisms for ongoing support should be put in place? Building some form of ongoing support, training and where necessary continuing investment would be key. There is a lot of knowledge and ambition within the care home sector to find new, person centred ways of using technology with their clients. This knowledge itself is a valuable resource but more is required to support, nurture, and share it. Ongoing developments in the programme should seek to capture and share the existing knowledge in the sector, as well as providing ongoing training and support. As noted earlier in practice, activities and wellbeing coordinators were typically fulfilling the role of digital champion by default, even if they did not recognise the role or seek digital champions training. Specifically targeting and recruiting activity/wellbeing coordinators to perform the role of Digital Champions may be preferable to creating a new staff role. However, there is a danger that such an approach could simply increase the workload of staff in these roles, which in turn may reduce their willingness to engage with the programme. Ensuring that they can clearly see the utility that digital technologies could bring, and that they have adequate time, training, and resources to support them should be a pre-requisite of developing this role.

More widely, it was clear that care home staff have differing training needs in relation to technology. The wider staff in care homes played a significant role in facilitating use of the technology but had different training needs when compared to activity/wellbeing coordinators. In contrast, activity/wellbeing coordinators frequently discussed wanting help in creatively using the technology to develop new activities or projects, for example by providing resources or examples of activities they could use or adapt to their residents. In contrast the general care home staff frequently wanted more assistance in the practicalities of using the technology, as well as how to best facilitate residents in the basics of using tablets (e.g., how to interact with a touch screen). Any development of the training

offered as part of the CRSCH should consider both sets of training needs. For activities coordinators, developing communities of practice where they can exchange and share their ideas would have the potential to augment their role, by providing them with the means to support each other and share ideas and experiences about what works. For general care staff, training should be easily accessible but not necessarily solely be online. Some general care staff expressed a preference for face-to-face training, situated within their care homes where they could receive the training, but also see first-hand how activities in homes could be supported by Tablets. As social distancing restrictions in care homes cease, providing more face-to-face training has utility, although there may be resource implications to adopting this approach.

The funding model that should be adopted in any ongoing delivery of CRSCH is also an important question. CRSCH was an emergency response to a crisis. As a new post pandemic normal develops, the initial approach to funding the programme may not be sustainable in the longer term. Most care homes in Scotland are privately owned and operated, and they might reasonably be expected to bear responsibility for funding their own technology offers. Post COVID, it may also be reasonable to expect that residents or their families will source and purchase at least some technologies themselves. Nevertheless, ongoing support is required if the benefits of the CRSCH are to be sustained. Statutory services or bodies may be expected to play less of a role in supplying homes with technologies post COVID-19, however, they are likely to need to play a role in providing ongoing support. Examples of support will include signposting to technologies and activities, hosting the communities of practice or providing greater degrees of face to face, care home-based support. One role that could be played by formal funding attached to the programme is providing streams to pump prime further investment, or that can enable care homes to creatively experiment with innovative approaches, ideas, activities, and solutions. Such a scheme should allow care homes to trial technology, learn and share their experience of what works, including sharing cases where technologies failed. As the focus moves away from providing a universal iPad offer, a more responsive and flexible funding stream that can enable individual innovations then share them across the sector would be a valuable addition.

Ongoing work in Scotland suggests some mechanisms through which support could be provided. Several organisations in the Scottish residential care sector have been developing more person-centred approaches to technology, in partnership with statutory bodies including the Scottish Government, DHI and SCVO. Leuchie House, the national respite centre in North Berwick has successfully trialled a care technologist role on their staff, while Scottish Care are also trialling regional care technologists to support their member organisations. Part of the care technologist role is to individually support clients and organisations in identifying how technology might help them, and what technologies could be put in place to support them. Care technologists also provide local training

for residents and clients, for general care home staff, as well as facilitating communities of practice among activity/wellbeing coordinators. It is likely that lessons can be learned from these organisations that can inform technology offers within care homes. For example, there may be potential to develop a similar care technologist role within the care home sector. Such roles may be hosted within larger care home organisations, within regional organisations such as the Health and Social Care Partnerships, or via national organisations such as Scottish Care.

The pandemic has also led to shifts in how care homes interact with the wider health care system. During the pandemic, consultations with GPs or other specialists within the health system shifted to telephone or online video consultation. How far these shifts will become a permanent feature of care homes remains to be seen but it is likely that at least some changes will continue post pandemic. Similar issues can be seen in the wider use of the iPads to support social activities within homes, with activities such as singing, reminiscence or exercise moving to online delivery. We saw examples where iPads were used in both video consultations with health care services, and for communal social classes or activities. Although we are unable to say how many homes this affected, it is highly likely that a substantial number of care homes would have had problems in managing access to online and video consultations if the programme had not taken place. While use of iPads for video-consultations or online activity groups has declined significantly since the height of lockdown, it has not declined to zero. By ensuring many care homes had ready access to the technology, the introduction of iPads across the care home system helped to facilitate this shift in health service delivery. Many staff and residents will also be much more familiar with video consultations as a result. How CSRCH works in partnership with the Near Me NHS videoconferencing platform, as well as its use in wider online activities should therefore be considered in discussions about continuing the programme. Such discussions should be cognizant that digital health consultations could marginalise those residents who are most vulnerable or have the most acute needs. While the iPads were broadly successful, a considerable proportion of residents lacked capacity to understand what is happening during a call, or simply did not want to engage with the technology. The needs of these residents should also be considered when making plans about using iPads for video consultations with health care services.

Mainstreaming of the knowledge and practice gained from CRSCH should be an important part of long-term planning. Good quality evidence is required, including evaluation and outcomes data. However, these data can be hard to collect, particularly in social care which lacks a common culture of research and evaluation, particularly when compared to health. Across both Scotland and the UK this is changing, with organisations such as DHI, or the recently renamed National Institute for Health *and Care* Excellence in the UK giving increasing focus to the social care sector (although it is important to note that Scottish access to NIHR Social Care funding stream is limited). Specific Scottish Government

strategies, such as the Digital Health and Care Strategy, the wider Connecting Scotland programme and the establishment of the National Care Service are all important forms of progress. What is essential is a greater understanding of the challenges facing social care, and the adoption of technology solutions that are centred on the needs of social care services and of their clients.

6.4 Recommendations for Scale Up, Spread and Sustainability

Based on the findings of this report, we make the following recommendations regarding the CRSCH programme:

1. **Recognise the wider use case for the CRSCH programme.** Many care homes are still routinely using the iPads for video calls, however there was clear evidence that their use for this purpose has declined, due to a lift in restrictions. Expanding the programme simply as a platform for video calls is not recommended unless evidence suggests a care home needs additional support, such as to replace a broken device. This report, however, has demonstrated how the use of iPads has clearly evolved as care homes have embraced the opportunities given to them by the technology (e.g., interactive, and social activities). We therefore recommend that the CRSCH programme should evolve based on this use case. There is a great deal of potential to both augment existing social activities among residents, as well as to potentially facilitate new or enhanced forms of social interaction. In addition, our evidence suggests that the introduction of iPads also influenced care home staff to use the technology to support their wider work. There may therefore be opportunities for the programme to facilitate increased use of electronic care or medication management systems. Evidence from the LADDeR study in South East Scotland suggests that such systems are underutilised within the care home sector (Johnston *et al* 2022). CRSCH can therefore further influence the adoption of technology in care home management.

2. **CRSCH can adopt a more personalised, flexible, and person-centred approach to technology.** If the CRSCH is to continue, it should evolve to become an individualised, creative, and person-centred technology programme, which promotes social engagement between and among residents, staff, and their families. Each care home will have significant and diverse needs as well as levels of technology adoption; some care homes will be more independent in their digital journeys, while others might require further hands-on support. Therefore, any ongoing version of the CRSCH programme should move away from supplying a single technology at scale. Instead, the programme should evolve to support individual homes to identify, source and use a wider range of technologies in ways that work for them and their residents. Such approaches should

also focus on identifying ways of using technology that can engage residents as individuals. This more person and home centred approach may involve making a wider range of devices available as part of the programme, rather than just iPads – for example, larger interactive monitors and tables such as the Interactive Touchscreen Table Meet UP by Sharp. It may also involve giving homes greater autonomy in decision making. Technologies offered through the programme should be provided flexibly, allowing care homes some degree of choice regarding devices, depending on local feasibility.

3. **Create a community of practice to support and sustain communication and knowledge exchange around the programme.** While there are several examples of good practice across Scotland, the fragmented nature of the care home sector means there are few opportunities for came homes to collaborate and share knowledge. Whether as part of a new or established structure, we recommend that communities of practice are developed, through which care homes can learn and share knowledge about their experience of what works, why, and in what circumstances. It is also important to consider how to communicate with care homes that have not engaged with the programme to better understand and address potential barriers. Networks providing similar support to care homes, including the Care about Physical Activity (CAPA) improvement programme (www.capa.scot), can provide a model for such communities of practice to be developed. There may be scope for the development of a staff role or roles, hosted by relevant regional or national organisations (e.g., Scottish Care, NHS Health and Social Care Partnerships, larger care home provider organisations), who can facilitate these communities of practice, as well as provide wider support for care homes seeking to expand their technology offerings. Such a role would bear similarities to the 'Care Technologist' role currently being developed and trialled within Scottish Care, and there may be scope for expanding this programme, or trialling a similar model within the care home sector (TEC Scotland 2021).

4. **Identify, support, and develop the role of Activity/Wellbeing coordinators**. Activities and wellbeing coordinators are the staff members who typically take responsibility in the adoption of iPads and are crucial to their successful use. However, not all care homes have these roles, and there was evidence to suggest that they often worked in isolation from each other, and even from the wider staff in their homes. Activities and wellbeing coordinators are a growing role who facilitate engagement and a whole host of social, physical, and other activities, including but not limited to technology. Reflecting their wider role and impact in the sector, activities or wellbeing coordinators should be present throughout the care home sector. Care homes that do not have

staff in these roles should be encouraged to establish them. There are benefits and challenges in relation to formally integrating technology into the activities/wellbeing coordinator role. They are well placed to provide individual, personalised support to their residents; they are often best placed to know what will work with residents on the ground. However, they have several existing duties, so there is the danger of adding further duties and pressures on this role. Therefore, where this role includes the use of technology, they should be properly supported. Such support should include training, particularly as technologies change. In addition, protected time and proper resources for the role are required (e.g., included in their job descriptions and role profiles). Staff in these roles would best be supported through the communities of practice listed above and in the case of technology, supplemented with training made available through continuing professional development.

5. **Develop training in person-centred adoption of technology across care home staff.** While we found that activities and wellbeing coordinators took greatest responsibility for supporting the use of iPads, all care home staff should ideally play a role. Training was highlighted as a frequent need, although the focus was less on the absence of training and more on the ability of homes and staff to access training. Training needs also differed across different staffing roles. Training should focus on two areas; 1) The fundamental aspects of using technology, to ensure the inclusion of staff members with varying levels of digital literacy. Here training should focus on general care home staff, and should focus on issues of accessibility, so that staff are familiar with functionality of devices and can support residents. Training on accessibility issues among older residents (for example in relation to dementia or sensory impairments) and accessibility options to support them should also feature here. 2) Training in creative and person-centred approaches to technology. Here training should be aimed at staff members with responsibility to developing activity programmes for activities and wellbeing coordinators in recommendation 4 and should focus on helping them develop activities using technology, including but not limited to iPads, which can enhance the lives of their residents. This training should accompany communities of practice mentioned earlier.

6. **Understand the specific technology needs of care homes in deprived areas.** Greater emphasis should be placed on understanding the technology needs of care homes in deprived areas. The quantitative secondary analysis suggests that care homes in deprived areas were less engaged in the programme. It is therefore recommended that greater communication channels and methods of outreach are established, with an emphasis on relatively more deprived areas. Strengthening

these channels will help understand the circumstances of the care homes located there. Further, it will provide opportunities to ensure that care home staff and management have an awareness and understanding of the value of receiving support with technology.

6.6 Limitations of the Evaluation

It is important to note that this evaluation was conducted with a subset of care homes within the CRSCH programme. Recruiting care homes has been identified as particularly challenging within research, and this was reflected in the evaluation conducted. While we attempted to ensure that our evaluation reached a representative sample, including variations in geographical location (including Highlands and Islands communities), deprivation and types of care home, the wide variation of care home types means that we are unable to claim that our findings represent the entire care home sector. Specifically, our evaluation has focused on care homes providing care for older people, often living with frailty or dementia. This means that there is an under-representation of the wider body of care homes in Scotland providing care for other groups. Our findings should be interpreted with this in mind. For instance, care homes supporting younger people may have a greater degree of use for digital technologies across their residents, but are also likely to have diverse needs, relating to education, or accessing health and social services. Findings from two of the four deep dive care homes, which provided care and support to adults younger than 65, did suggest a higher degree of digital technology use among its residents, although this one example does limit the conclusions we can make across the programme.

We did not conduct a cost effectiveness analysis as part of this evaluation, as this was beyond our scope. While we can provide useful insights into the value proposition of the programme, we cannot therefore provide detailed recommendations regarding the degree of investment made in the programme or its overall cost-effectiveness. Where decisions are required regarding cost effectiveness of the programme, we would recommend a mechanism such as Social Return on Investment analysis. It can assess the monetary impact of a range of social benefits experienced through delivery of the evaluation, which may not be easily determined using other forms of cost-benefit analysis.

COVID-19 continues to pose huge challenges for the Scottish Care Home sector. As noted, many care homes continue to face periods of social distancing restrictions, including home closures, as well as perennial difficulties in the sector which have been exacerbated by the pandemic such as recruiting and retaining staff. During our fieldwork, many care homes were closed to visitors or were experiencing repeated closures and re-openings, which caused delays in our ability to access care

homes, particularly in relation to our deep dive workshops. Many of these challenges did have impacts on the evaluation. Specifically collecting data regarding resident's recollections of using tablets when they were first deployed in Dec 2021 was difficult given the time that had lapsed since this period. The introduction of visitor restrictions because of COVID outbreaks did have impacts on the evaluation. For example, the deep dive workshops were delayed until later in the project due to temporary closures in homes, while wider interviews also faced delays. Our initial attempts to contact care homes via an email mailshot, quickly established that this would not be an effective means of recruitment. We therefore adopted a more proactive approach involving telephone calls to individual care homes to invite relevant staff to participate. While more labour intensive, this approach did prove to be surprisingly successful. When contacted directly by phone, a much higher number of care homes agreed to take part than we expected, and even where homes declined to take part, we were still able to collect useful contextual data about the pressures facing care homes. However, given our project resources, this would not be a practical method of collecting large scale survey data across Scotland. As a result, we chose not to conduct a national survey, and instead provided a secondary analysis of an existing survey distributed by SCVO in conjunction with CGI. This had the advantage of not overburdening care homes with research requests during an already extremely challenging time.

6.7 Conclusion

In summary, as part of the wider Connecting Scotland programme, the CRSCH was introduced to care homes during the second national COVID lockdown in December 2020 – March 2021, so that residents could maintain at least some degree of social contact during a period of sustained social isolation. In this regard, our evaluation argues that CRSCH was broadly successful in this aim. The urgent need to facilitate video calls has now passed, except for local COVID-19 outbreaks. It is unlikely that the care home sector will again face the challenges faced during 2020 and 2021, although of course this possibility cannot be discounted. Based on this, there is an argument to say that CRSCH was a COVID-19 related emergency measure, which has run its course and can now end.

We would argue that CRSCH has met its original purpose, but in doing so has developed a new purpose; it is through this new purpose that its continued scale-up, spread and sustainability can be achieved. Notwithstanding the fact that COVID-19 has not gone away for care homes, CRSCH's original goal has largely been supplanted by its potential to facilitate wider social activities and social engagement within and across care homes. Homes demonstrated some creative and innovative uses of the technology, and these opportunities to engage and connect with residents should be extended. it would be a shame for this progress not to be built upon. The programme can continue based on this

new use case, and we have supplied recommendations to support it to do so. If this is to be achieved, continuing training and knowledge exchange will be required, to raise awareness of the wider use of technology in care homes, to train those using the technology with residents, and to share examples of what does and does not work.

Using the NASSS framework also meant that we were able to identify the factors that influenced the adoption of the CRSCH programme as well as its continued spread and sustainability. The introduction of technology at a critical time both facilitated social contact and provided means to further develop social activities in care homes. Where the programme was successful, staff were enthusiastic about the technology, highly creative in generating ideas about how it could be used, and had the autonomy, flexibility, and support to do so. They were also able to put in the work that was required to make video calls successful. Where use of the technology was sustained, it was often due to the initiative and enthusiasm of staff. This is not to underestimate the ease in which the iPads were introduced. We have charted the extra work, largely unsupported, which was required to make video calls 'work.' This workload appeared to fall on activity and wellbeing coordinators the most. We found less evidence to suggest that the iPads were routinely used among the wider staff in the home. Where activities/wellbeing coordinators were not present in a home, or where a person had left this role, then technologies were much more likely to be abandoned.

Findings from similar technology programmes such as the Near Me evaluation (Wherton & Greenhalgh 2020) and LADDeR (Johnston *et al* 2022), demonstrate the mainstreaming of video conferencing and similar technologies taking place in the health and social care sectors in Scotland. For those people who require long term care within care homes, technologies have a marked potential to improve their wellbeing and quality of life, as demonstrated by CRSCH. This potential suggests that the CRSCH should be continued in some form but with a wider scope and wider goals. While the national rollout seen in Winter 2021 may no longer be appropriate, a more personalised, flexible, and person-centred model, which can adapt to the needs of individual homes and their residents, is a model that the next stage of CRSCH should be built around.

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Appendix 2. Rapid Review Methodology

Bibliographic database	Comments
EBSCOhost	This service was used to simultaneously search the following individual bibliographic databases: CINAHL Complete; EconLit; Education Research Complete; Health Source: Nursing/Academic Edition; MEDLINE; PsycINFO; SocINDEX with Full Text.
Web of Science (via Web of Knowledge)	This service was used to simultaneously search the following individual bibliographic databases: Science Citation Index Expanded (SCI-EXPANDED); Social Sciences Citation Index (SSCI); Arts & Humanities Citation Index (A&HCI); Emerging Sources Citation Index (ESCI).
Social Care Institute for Excellence, Social Care Online	UK's largest database of bibliographic information on social work and social care. Searches data from 159 social work and social care related journals.

Table A.1: Search databases

Relating to social isolation	Population of interest	Technology
(social* AND isolat*) OR (social* AND connect*) OR lonel* OR (social* AND tie*) OR (social* AND participat*)	Care home OR Residential Home OR Nursing Home OR aged care home OR long-term care OR care facility OR residential facility OR continuing care OR palliative	technolog* OR SMS OR phon* OR smartphon* OR internet OR social media OR online OR ICT OR video* OR virtual OR digital

Table A.2: Search terms

Table A.3 details inclusion and exclusion criteria for our review. Our inclusion and exclusion criteria were developed prior to the search. Publication dates were limited to post 2010 due to the technological nature of the interventions under study, which became more commonly deployed as consumer devices post 2010. We focused on papers reporting interventions involving technologies to promote social participation and connectedness as a primary outcome. Location was limited to residential care, nursing care, or aged care facilities. Locations such as sheltered or supported housing, or hospice services were excluded from the review.

	Inclusion criteria	Exclusion criteria
Studies	*Language:* Full text published in English	*Language*: Studies without a full text in English
Population	*Publication Date*: Studies first published on or after 1 January 2010 *Study types:* reports of primary qualitative or quantitative or mixed methods research. Case studies or evaluations of existing interventions or services.	*Publication date:* Studies first published before 1 January 2010 *Study types:* Study protocols without reports of primary research. Position papers. Articles which do not report primary research. Conference abstracts. Conference proceedings. Literature Reviews of published articles.
Intervention	Any intervention which is described as either intended to reduce social isolation or loneliness or increase social connectedness, and b) is based on, incorporates the use of, or is delivered via smartphone and tablet-based technologies. Any intervention which uses such technologies to facilitate care home residents to facilitate service user access to interventions/programmes intended to reduce social isolation or increase social connectedness.	Interventions which do not have the reduction of social isolation or loneliness as its main or only aim. Interventions which do not incorporate the use of ICT, internet based or digital technologies, or use such technologies to facilitate social connectedness. Interventions involving the following technologies: Social Robotics, Exergames or video game platforms

Outcomes	Changes in social connectedness, social inclusion or social participation and its constituent elements. Feasibility of intervention Acceptability of intervention Usability of intervention technology	Papers which focused on outcomes unrelated to social connectedness, inclusion, or participation (e.g., physical health, mental health, 'wellbeing'). Papers which did not report social connectedness, inclusion, or participation as primary outcome measure.

Table A.3: SPIO table of Inclusion and exclusion criteria

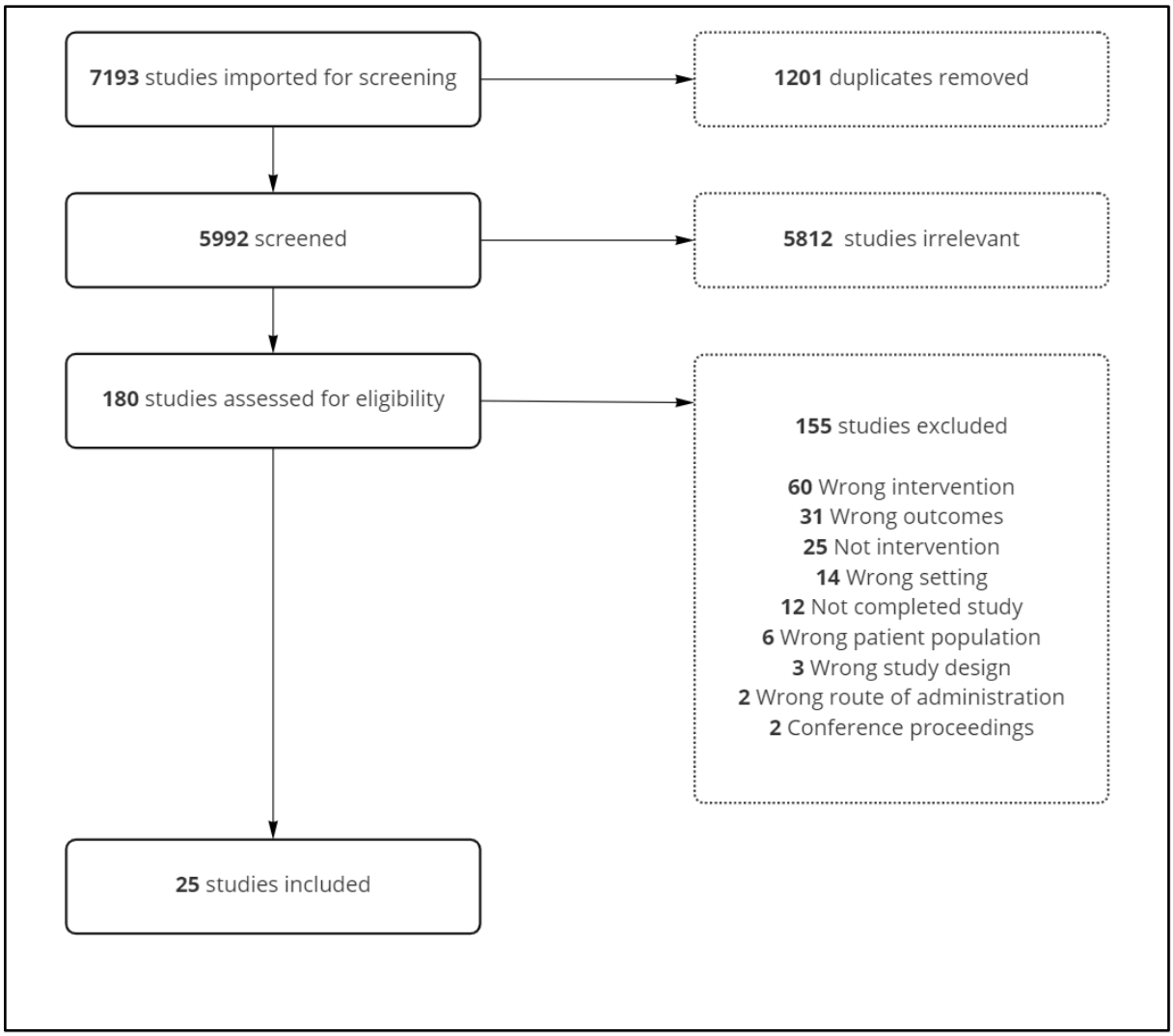

Figure A.1: PRISMA flowchart

The literature search and later process of narrowing our search can be seen in the PRISMA flowchart (Figure A.1). After screening of duplicate records, 5992 papers were examined for inclusion in the

review. Two members of the project team conducted a title review of all records (IP and a combination of GG, LM and CWN). This process led to 5812 papers being removed from the search. The remaining 180 full text papers were then subject to an abstract search. At this stage, a further 155 papers were excluded, leaving 25 papers included in the full review.

The findings of this review were drawn on using a systematic data extraction process, conducted by one member of the evaluation team (IP) with contribution and guidance from a second member (LM). We conducted a quality assessment of all reviewed papers after the data extraction had been completed (Table A.4).

Research Methods	Low quality	Medium quality	High quality	**Total**
Qualitative Research	2	6	2	10
Randomised Controlled Trial (RCT)	0	0	0	0
Controlled Before and After Study (CBA) or an uncontrolled Before and After Study	0	1	0	1
Other	4	8	2	14
Total	6	15	4	25

Table A.4: Outcomes of quality assessment of reviewed publications

Publications were rated as low, medium, or high quality using the following criteria, which differed for each type of research methodology. For studies reporting on qualitative research search criteria included: clearly articulated research questions, clear justification of the research approach, appropriate choice of research methods for the research questions, clear description of the study context, clear description of the role of the researcher, clear description of the sampling method, clear reporting, appropriateness of data collection and analysis methods, and argumentation supported by sufficient evidence. Controlled and uncontrolled before and after studies were assessed based on the following criteria: appropriate baseline measures, whether the groups were similar at baseline in terms of prognostic factors, whether they had been a blinded assessment of primary outcomes, whether the primary outcome measures used where reliable, and whether there had been appropriate and equal follow-up of control and intervention groups by professionals. Other types of research methods were assessed based on the adequacy of each publication in terms of information sources used, as well as clarity of research questions, objectives or hypothesis and study design. Comments were made on each publication's appropriateness and adequacy of sampling data collection and data analysis methods. Upon completion of the quality assessment, two publications reporting on qualitative research were rated as low quality, six as medium quality and two as high

quality. One uncontrolled before and after study was rated as medium quality, while other research methods included four publications of low quality, eight of medium quality and four of high quality, as presented in Table A.4.

Appendix 3: Interview guide

Introduction and consent

I will now begin a short recording to request your consent, by reading a number of statements. If you agree with the statement, please respond positively by saying 'yes' or 'I do.' If you do not agree with one of the statements below, respond negatively by saying 'no,' or 'I don't.'

I confirm that I have read and understood the information sheet explaining the evaluation project and I have had the opportunity to ask questions about the project.

I understand that my participation is voluntary and that I am free to withdraw at any time during the study and withdraw my data within one month without giving a reason, and without any penalty. I understand that beyond one month, when data are analysed and may be published, it may not be possible to remove my data from the study.

I consent to being recorded.

I understand that all information will be accessed only by the project team, that any audio recording will be deleted upon completion of the study, and that all evaluation data will be kept for a minimum of ten years in line with University of Stirling data protection policies.

I agree that the information I provide can be used on condition that it is kept confidential and anonymised. The project team may use summarised information that does not identify me in reporting the outcomes of their study. I give permission for members of the evaluation team to have access to my anonymised responses.

I agree for my personal data to be kept in a secure database so that I can be contacted about the next stage of this evaluation and about future events or activities relating to this project.

I understand that the researchers may have to breach confidentiality where information is disclosed which suggests that someone may be harmed or in danger.

I agree to take part in this evaluation by participating in an interview.

Can you please confirm your name?

And could you confirm that the date today is DD/MM/YYYY?

Having recorded your consent, I would like to ask for your demographic information. Please answer the questions you feel comfortable with.

Can I ask your age, gender, and ethnicity please?

What is the first part of the postcode where you work?

What is your current role title?

Interview

1. Understanding the context

- Ask the participant to talk about their role in the care home.

- Who are the patients/residents

- In what ways is the interviewee interacting with them

- Who else works in the care home – how many people approximately

- What percentage of your working time do you spend interacting directly with care home residents?

- Approximately how long have you worked or volunteered in a care home environment for?

- Is the participant a digital champion/ or is there a digital champion in the Care Home? Have they received training?

2. Discuss the details of the programme:

- How did the home hear about and get involved in the connecting Scotland's care home project?

- When were the iPads received

- How many?

- What are the main uses and what software is used for them?

- Have there been any changes in the main uses of the iPads, from the time they were first introduced until today?

- Who else is involved in supporting the use of the iPads?

- Optional: Why did you request for additional iPads?

3. Discuss the value, facilitators, and challenges for residents

- Value: thinking about a specific resident, during a typical day for them, when and how would they use the iPad'? What are the main benefits of the programme for this resident?

- Challenges: What might make it difficult or not appealing for a resident to make the most of these devices?

- Facilitators: What do you think makes the iPads easier or more appealing for residents to use?

(Encourage the participant to talk about how residents have been supported or what support is needed – prompts: people, culture, infrastructure, physical environment).

- The participant will be encouraged to talk about the role of relatives here as well. This may come up organically when discussing the use of the iPad (e.g., speaking with relatives), or the facilitators (e.g., the relatives help the resident use the device).

4. Discuss the value, facilitators and barriers for staff and management

- What would be the benefits of this programme for the care home staff and management, if any?

- What would make it easier for the programme to run smoothly?

- What challenges have been faced or are anticipated in the future?

5. Revisiting the programme

If you could design the programme yourself from the beginning, and you could choose everything, the type of devices (it does not need to be iPads), the quantity, the infrastructure, the timing, the people involved, the training and support provided, etc., do you think you would do everything the same way or is there something you would do differently?

Wrap up

Thanks, final comments, inviting the participant to ask any questions or to provide any information that they would like to share but have not had a chance to do so.