Technology, care, independence and prevention

Discussion material

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IMPACT
Improving Adult Care Together

The Health Foundation

UKRI Economic and Social Research Council

How you can use this discussion material

Before our first session, we'd like everyone to read this document which summarises the evidence from research, practice and lived experience about technology and ways it is used to support independence and prevention in adult social care. The aim of this material is to spark discussions in your local Networks about your experiences and ideas for change.

This material outlines policies across the four UK nations related to technology and care, and the kinds of devices and systems that have been used in the past, and are increasingly part of care arrangements and services today. Examples of emerging technologies explored include: Artificial Intelligence, robotics and smart devices. The discussion material also considers some challenges related to technology and care, with examples from across the UK.

What's the issue?

Technologies have been part of adult social care provision across the UK since the 1960s, and are still a key feature, with an estimated 1.8 million people using 'technology-enabled care services' (TECS) and devices across the UK (DHSC, 2023) *(for further explanation of key terminology please refer to the glossary at the end of the document)*. The types of technology used have changed over time. Kevin Doughty and colleagues (1996) wrote about 'three generations' of TECS – 'telecare' as it was then – predicting more recent developments that use Broadband and Wi-Fi:

- First generation: 'pendant alarm' systems that allow people to summon help in an emergency, typically connected to an 'Alarm Receiving Centre' (ARC) where staff then call a response service, 'named responder' (usually a local family member, friend or neighbour) or the emergency services to provide in-person support.
- Second generation: environmental sensors which automatically send an alert to an ARC if there is a risk detected such as movement or opening doors at irregular times, smoke, carbon monoxide, flood or extremes of temperature.
- Third generation: Doughty and colleagues predicted that Broadband and Wi-Fi connections would allow people to create 'virtual neighbourhoods' to connect with health and care services, and engage with hobbies and community groups online.

Technology has not stood still since the 1960s, and as advances have been made, new ways to use new devices and systems to social care have emerged. There have also been other catalysts for change, including the 'digital switchover', due for completion by 2027, but already underway or completed in some areas of the UK. The switchover means TEC devices and systems that rely on analogue phone lines will not function reliably via new digital telecommunications connections and need to be replaced by digital alternatives, prompting some local authorities to reconsider their TECS offer. Progress with changing over devices has however been mixed, and there have been some examples of where TEC connections have been unreliable or lost (Hamblin, 2020). The COVID-19 pandemic also

increased the use of mainstream or 'off the shelf' technologies, such as smart devices in the delivery of public services, including adult social care (Hamblin, 2023).

New technologies bring opportunities to adult social care services, to those who provide care, and to people who receive care and support. They also present risks and challenges that, with consideration, can be navigated. In this discussion material, we provide a brief overview of the evidence related to emerging technologies that are being used in care arrangements and systems, focusing on three key areas highlighted in a recent research study (Stalker et al., 2024): 1) Artificial Intelligence; 2) Robotics and 3) Smart devices. We also explore the challenges related to this area, including: choosing the right technology; the new tasks created; deciding on and evidencing outcomes; co-production; ethics and digital exclusion and inequality.

Box 1: Technology and care across the four UK nations

Scotland has been at the forefront of TEC policy. From 2006-8, the Joint Programme Initiative invested £20m in telecare, with 44,000 people receiving a service as a result, which in turn facilitated 2,500 hospital discharges, avoided 8,700 emergency admissions to hospital and over 3,800 to care homes (NHS Scotland, COSLA and The Scottish Government, 2012). However, in 2018 the Government noted there was a "limited uptake of technology enabled health and social care initiatives and a lack of deployment at scale", and a necessity to "move from board-level implementation towards a once-for-Scotland national system" (Health and Sport Committee, 2018: 16). To accelerate the adoption and spread, the Directorate publishes regular strategies in partnership with The Convention of Scottish Local Authorities (COSLA). The 2021 strategy included three aims – 1) giving citizens greater control over their data; 2) providing person-centred services with 'ethical digital foundations'; 3) enabling care planners and researchers to draw on data and develop innovative systems (Scottish Government and COSLA, 2021).

In **England**, the Department of Health in 2002 set the ambitious aim that 'remote monitoring systems' would be in all homes where people needed it by December 2010. This was followed by a significant funding programme to support Local Authorities to develop their telecare services – the £80m Preventative Technology Grant (2006-2008) (Office of the Deputy Prime Minister and Department of Health, 2006). However, as Local Authorities 'bid' for funding, an evaluation reported that there was uneven distribution and implementation funding (Barlow et al., 2012). Total public expenditure on telecare in England in 2006-8 was £132m, boosting the people using telecare by 150,000 in 2006/7 and a further 161,000 in 2007/8 (Joint Improvement Team, 2008). More recently, government investment in England has focused on supporting Local Authorities and care providers to pilot and trial emerging technologies, such as AI, smart devices and robotics in care (e.g. Social Care Programme) [2016-2021] with a total investment of £22.8m (Wright, 2020; Whitfield and Hamblin, 2022). The 2021 White Paper 'People at the Heart: Care' also highlighted the English Government's commitment of £150m over three years

to advance sector digitisation and enhance care technology for preventative care and independent living.

Wales' first national telecare strategy was launched in 2005. Prior to 2006, only around 3,000 individuals in Wales were receiving a telecare service. In response, the Telecare Capital Grant was launched, with the aim of providing sensors and equipment to 10,000 homes (Barlow et al., 2010). This Grant (2006-9) made £8.9m of funding available to Local Authorities and the initial target was exceeded; by December 2009, almost 18,000 individuals were receiving a telecare service (Barlow et al., 2010: 5). However, as with England's Preventative Technology Grant, as Local Authorities could design their own independent plans and policies, provision was inconsistent across Wales with a "postcode lottery" in charge to people receiving technology-enabled care (Barlow et al., 2010; Wright, 2019). Since then, the Welsh government has made further investment in technology and care as an integral part of providing support to people living in rural areas. In 2014-15, Health Technology and Telehealth Fund provided £9.5m and the Efficiency through Technology Fund another £250,000 to fund telehealth in Mid-Wales (Mid Wales Healthcare Collaborative, 2016).

Northern Ireland too provided resources in the 2000s to health and social care Trusts to develop telecare projects, with £1.5m available in 2008. Whereas in the other UK nations, there is diversity in technology-enabled care provision across Local Authorities/councils, in 2011, the Centre for Connected Health and Social Care (CCHSC) "adopted the largest mainstreamed telehealth service procurement in the UK" (Deloitte, 202: 13), awarding an £18m contract to TF3 (a consortium of Tunstall, FoldHousing and S3) to roll out a telehealth and telecare service across all five health and social care Trusts (Wright, 2019; Al-Obaidi et al., 2022). More recently, a key area of focus has been to be the first of the four UK nations to use single electronic records for health and care, with the £275m Encompass Programme launched in 2022 (Whitfield and Hamblin, 2023).

Emerging areas of policy and practice

Artificial Intelligence

One recent area of policy focus and funding across all four UK nations, and of growing interest to commissioners and care providers, is Artificial Intelligence (AI) - essentially **devices and systems that simulate human intelligence** and problem-solving capabilities. Examples of AI in use in care include 'chatbots' and automated call systems; 'predictive analytics' that use data to anticipate harm before it occurs; and generative AI to support administrative functions.

Evidence about how effective AI is in social care is still emerging (Creswell et al., 2020), but some studies have highlighted the potential of AI and related technologies to enhance **quality of life for people who need support** and **improve working conditions for care workers**. For example, some studies have found AI can boost the **efficiency** of care home services via applications that are able to quickly match workers to vacancies or shifts (Cingolani et al., 2023). Additionally, AI applications at the administrative level can improve

public service delivery; for example, a review found that AI could help plan care for people with dementia (Belam and Nilforoosha, 2021). AI functionality within telemedicine devices also offers potential for telemonitoring and tele-rehabilitation, especially for people with chronic conditions, improving outcomes and **reducing staff workloads** (Cingolani et al., 2023). A review of the evidence found AI had the potential to support people with dementia to engage in activities and alert carers and staff of any issues (Belam & Nilforooshan, 2021). AI has also been advocated as a means to **reduce health inequalities by making processes more efficient** e.g. scheduling, staffing, patient outcome prediction and enhancing person-centred care (Currie et al., 2024).

However, the evidence reviewed also discusses **challenges** related to AI use in the care sector. Some argue the **pressures within the care sector** mean shifting easily towards the preventative model that AI could support is difficult (Glasby et al., 2023a). Cingolani et al's. (2023) review of AI-based digital and healthcare tools in Italy's home care services found that claims made regarding AI's **workforce efficiencies are questionable**, as even autonomous AI systems need human intervention or action. Indeed, participants in a study by Dlugatch et al. (2023) stressed that AI **should supplement, not replace, humans** mainly due to concerns about AI's ability to make holistic assessments. Concerns also include whether AI raises issues related to **accountability** and **surveillance** (Cingolani et al., 2023; Currie et al., 2023; Whitfield et al., 2024). **Data privacy** concerns also hinder AI adoption (Cingolani, 2023) and legal and ethical issues require **clear guidance and frameworks** to protect people's rights (Cingolani et al., 2023). In the UK, examples of ethical and legislative issues include the 2017 Royal Free Hospital violation of the UK Data Protection Act, in its deal with DeepMind and NHS Digital's controversial partnership with Amazon (Whitfield et al., 2024). There is a need for ethical AI models that align with public values of equity, fairness, and inclusion (Hjaltalin et al., 2023).

There are **ways forward** suggested in the evidence related to AI and care to navigate some of these issues. In research with developers of social care and AI-related technology and advocates involved in AI systems, participants suggested that whether AI can be trusted depends on the institution developing it. They highlighted that trustworthiness translates to reliable, unbiased, and inclusive data that do not perpetuate existing social inequalities. Therefore, **human oversight and frameworks are needed**, incorporating the views and perspectives of individuals with lived experiences of care (Nash et al., 2023). In February 2024, representatives of adult social care organisations met at the University of Oxford to discuss the benefits and risks of using 'generative AI' in social care and drafted a statement which outlines some key concerns and called for a **shared, co-produced framework of how generative AI could be used responsibly in care.**

Robotics

The potential of robotics is also widely discussed in terms of how they can support care delivery and services. Robots are integrated systems of machines and devices that share control programmes and sensors, enabling autonomous decision-making. These systems come in various forms and serve diverse purposes in social care. Examples include:

- **Physically assistive robots** for lifting and carrying
- **Socially assistive robots** to support interaction
- **Cognitive assistance robots** for help with cognitive tasks.

While robotics are **not yet widely used in social care in the UK**, they have the potential to transform both everyday life in care settings and social care policy. However, it has been argued evidence of their effectiveness in social care is underdeveloped and sometimes of poor quality, necessitating further research (Abdi et al., 2018; Consilium Research & Consultancy, 2018; Papadopoulos et al., 2020). Of the examples of evidence we found, some argue the use of **robots can positively affect people who live in care settings**. Rodríguez-Domínguez et al. (2024) examined interactions between social assistive robots and people with mild to moderate cognitive impairment in a day centre setting. Participants maintained eye contact with the robots, felt comfortable during interactions, and engaged meaningfully. They did not exhibit nervousness or unease, indicating comfort with the robots. High memory engagement and confidence scores suggested participants were actively trying to remember and engage with conversation topics. Similarly, Pu et al. (2023) reviewed the existing research on robots in care, suggesting social robots can improve psychological, physiological, and quality of life outcomes for older adults. Social robots showed therefore potential in reducing negative symptoms and improving quality of life, though current evidence is limited.

The evidence is also mixed regarding the **implications of robots in the care workforce**. Papadouplous et al. (2018) in a review of the evidence found limited studies that addressed how care workers' experience the use of robots in care work. Ren et al. (2024) focused on understanding the facilitators and barriers to implementing 'telepresence robots' – robots that support virtual 'visits' – in hospital and care settings in Canada. By interviewing formal caregivers, residents, and patients with dementia, they identified improved communication and engagement between residents and family members, enhanced staff efficiency, and positive resident reactions to the robots. However, barriers included technical issues, initial resistance from staff, the need for training, and concerns about robots replacing human interactions. Ide et al. (2024) explored ethical perceptions regarding robots in care homes across Japan, Ireland, and Finland. The study highlighted **privacy concerns, autonomy, trust in technology, and cultural differences** as key factors influencing ethical perceptions. Acceptance and trust in care robots varied by country, emphasising the importance of cultural context in shaping ethical views. Wright (2018) noted similar concerns among caregivers in Japan, where there is a significant demand for care due to an ageing population and a decline in familial caregiving. Despite investments in high-tech robotic lifting devices, like the 'Hug' robot, many caregivers resist using these devices, viewing them as disrespectful and inappropriate when assisting with particular care tasks. This resistance underscores a gap between technological solutions proposed by engineers and policymakers, and the lived experiences and values of caregivers. In addition, Wright's (2019) found that introducing **robots required more rather than less input from care staff**, with additional tasks focused on supporting the robot rather than the people in the care setting, reducing the need for communicative or tactile contact.

Smart devices

There has been recent interest in technologies such as **smartphones, smart speakers and tablets, wearable sensors and 'Internet of Things'** - based monitoring systems amongst care commissioners and providers (Hamblin, 2022; Wright 2021). The emerging body of research highlights the positive impact of these technologies on the health and wellbeing of older adults, including improvements in physical health, emotional support, and the reduction of caregiver responsibilities (Maswadi et al., 2020). When smart devices are compared with specialist TEC equipment, benefits cited by commissioners, care providers and people who receive care included: that they are cheaper, easier to use and less stigmatising (Hamblin, 2022). Commissioners interviewed also saw the benefits of thinking about how devices people may already have in their homes to support care in terms of further cost savings (Wright, 2021).

Table 1: Examples of recent Local Authority pilots using smart devices in care

Smart Device	Brief Description of Pilot
Smart speaker	A collaboration between Local Authorities and a "brokerage" service to develop skills and support to enable people (*n* = 50 in pilot) to use a smart speaker for reminders and environmental controls (lights, music) within the home.
Smart wearable	A pilot (*n* = 300) of a wearable device to record users' sleep and activity patterns.
Smart speaker	A pilot (*n* = 10) using smart speakers to provide medication prompts and address social isolation.
Smart speakers, wearables, phones, plugs	A pilot (*n* = 120) to see how various smart mainstream technologies could generate data on activity for prevention and be used to trigger alerts and reminders for users.
Smart speaker	A pilot in collaboration with local community organisations and partners, to develop a skill for a voice-activated smart speaker to allow isolated and vulnerable people to order meals and essential food items.
Smart speaker	Local authorities created a skill with "top 10 questions" regarding Local Authority services (e.g., refuse collection).

Source: Hamblin, 2022.

Box 2: Using Alexa in adult social care

Hampshire County Council, together with PA Consulting, explored how smart devices like the Amazon Echo could improve the lives of people receiving social care. This project focused on using consumer technology as an alternative to traditional telecare equipment, as it is generally more user-friendly, offers extra features like access to audiobooks and radio, and is less likely to stigmatise users. The trial involved 50 adults and assessed whether voice-activated technology could promote independence and wellbeing. The results were encouraging, showing that Alexa devices reduced social isolation and provided reassurance to families, who could receive notifications through the device. Financially, the project was beneficial, with estimated savings of £7,700 for the six-month trial and around £66,300 for 50 users over a full year. In addition, 72% of participants reported that the technology improved their lives, and 68% felt it helped them maintain their independence. A special Alexa Skill was developed to help care workers log and share information more efficiently, supporting the wider care system.

However, the project faced challenges, including ensuring compliance with data governance policies, particularly as the development of Alexa skills handled personal data. Recruiting volunteers for the trial and managing issues with Alexa devices activating prematurely raised concerns. Additionally, the fast-paced evolution of Amazon's product features posed a risk, as new functions could potentially overlap with the features developed during the trial (Hampshire County Council, 2018; PA Consulting, 2024a; PA Consulting 2024b).

However, smart devices also present challenges. Though mainstream smart devices are seemingly commonplace and may not need adult social care services to purchase them for people, there are still **digital divides** in access. Data indicated that:

- 46% of people with a disability in Great Britain had used an Internet of Things device or system within the previous three months, compared with 68% of people without a disability
- almost half of adults in Great Britain aged 25-34 years used a virtual assistant smart speaker or app within the last three months compared to 17% of those aged 65 years and over
- 84% of all adults in Great Britain use a smartphone compared to 53% of those over 65 (ONS, 2020)

Additionally, although these technologies could help people to connect to others, there is a potential for **social isolation** if in-person care visits are replaced. Concerns have been raised regarding data ownership and ethical issues, the complexity of the market for smart devices, the need for assistance to navigate it, and the lack of support for integrating technology into care (Hamblin, 2022). Baig et al. (2019) wearable sensors and IoT-based monitoring applications aimed at supporting the independent living of older adults, highlighted that existing literature tends to focus on the technical aspects and accuracy of these devices, such as data collection, but often overlooks issues such as **lack of**

interoperability, battery limitations, and challenges associated with monitoring. Dada et al. (2021) reviewed existing studies on assistive technologies, including smart devices, for individuals with dementia, and noted that current research does not pay enough attention to different types of dementia and severity of communicative impairments, and often does not involve direct evaluations with people with dementia. This then makes it more challenging to understand whether smart devices in care will be appropriate for people with dementia. These considerations also apply to thinking about whether they will be appropriate for everyone who accesses adult social care.

Overarching challenges

There are some overarching challenges when integrating technology and care. One key challenge is **how to choose the right technology** to meet the outcomes you – as a commissioner, care provider, person providing or receiving care – want to achieve. There are so many technologies available, it can be very difficult to navigate what is an increasingly complex marketplace (Hamblin, 2022). It can be tempting to focus on the technology and the possibilities it could bring first and think about the wider changes required of care services to really deliver positive outcomes second.

Box 3: Choosing technology - what is the problem you're trying to solve?

A recent project that explored how care providers can use AI produced a guide to help commissioners and care organisations choose technology (Glasby et al., 2023: 4-5).

"Identifying a problem": The process of selecting a technology should start with a specific problem you are trying to solve, or a specific population you are trying to help, rather than the other way around (starting with the technology and then finding a use for it).

Broader strategy: What are your broader plans for providing social care locally, and how does this technology fit with this direction of travel? Frustration can occur if a new technology is introduced that doesn't really fit with other things that are happening.

People who draw on care and support, and their carers: If a technology will be installed within the living space of people who draw on care and support, it's important to involve them as early as possible to understand their (and their carers') concerns and how they might be addressed. This might include issues with using technology, internet connection issues, fears about privacy, ethical issues, and the practicalities of having equipment in the house or wearing equipment.

Care staff: In defining the problem you are hoping to solve with the technology, it's important to engage with relevant staff from across the organisation, not just senior managers, but those who directly deliver care. Be prepared to discuss any potential changes in job practices, and the implications for people's roles and responsibilities.

Outcomes: Do you all agree what success might look like (and how it can be measured)? What evidence do you have that what you are hoping for may be possible, and are there other people trying to achieve similar things that you could learn from or work with?".

As we have seen above regarding robotics, there are implications for the care workforce when technologies become part of their jobs, and technologies in care can also **create new roles or tasks**. For example, studies have highlighted the importance of services like assessment, installation and support teams, as well as appropriate response services in influencing the outcomes of technology (Hamblin, 2023). When thinking about how devices may prevent a negative outcome, beyond the ability of a device or system to accurately assess risk, is the need for the right kind of support to ensure this outcome is avoided, and that will depend on a variety of factors.

Box 4: The importance of the technology-enabled care *service*

The Delta CONNECT initiative, led by Delta Wellbeing in collaboration with health and social care partners, focuses on transforming social care through the use of technology and co-creation. CONNECT employs a digital approach, incorporating technology-enabled care services (TECS), a 24/7 welfare response and – crucially proactive, rather than reactive calls. These proactive calls are key to a service model that is adaptable, providing support in both community and hospital settings, allowing for personalised care that meets individual needs. People using the service receive a Wellbeing Assessment to establish the outcomes that are important to them, and to then identify local opportunities and activities that might be helpful. Additionally, the use of technology and data analytics enhances decision-making, improves client outcomes, and promotes equality and inclusion in care delivery. Since its launch in January 2020, CONNECT has significantly reduced pressure on the NHS and social care by managing demand and flow. The programme has made over 80,188 proactive calls and attended 11,900 call-outs, with only 6% requiring escalation to emergency services. The Blue Army initiative within hospital emergency departments has facilitated quicker hospital discharges, preventing 1,655 bed days and saving £752,363, demonstrating the effectiveness of integrating social care with health systems (Dix & Taylor, 2024).

Ethical considerations are also important when using new technologies in care settings or arrangements. A review of Jokiken et al. (2021) identified four key ethical issues: (1) privacy, or the sharing and ownership of personal information; (2) whether technology is beneficial to wellbeing and reduces harm, (3) justice, or the fair distribution of resources, and (4) trust, or whether people feel secure and respected.

Despite the promising potential of digital technologies in care, substantial issues remain regarding digital inclusion, and in turn **digital poverty**, as discussed in the section on smart devices, but also applies to the shift to digital across services more generally. For some groups of people accessing and using digital services it is more difficult for reasons related to the ability to afford devices and internet connections, accessibility, confidence and skills; if this then means they are more disadvantaged as they then cannot access support and services that are available online, they are experiencing digital poverty. Recent research exploring unpaid carers' experiences of digital public services found they often felt they were 'forced' to 'go online' without being given alternative options (Hamblin and Black, 2023;

Rousaki et al., 2024a, 2024b). Carers described the challenges they faced in using digital options, including affording devices and internet connections, a lack of time and skills, and real concerns about privacy and 'scams'. They highlighted the material challenges posed by digital technologies, such as poor internet connectivity, especially in rural areas of the UK, which made their access to services and resources particularly challenging. Carers emphasised the need for better training and greater accessibility of information technologies (see also Rasouli et al., 2023).

Box 5: Navigating digital exclusion

Address digital poverty: The provision of loan and repair services (and publicity about these services) could support more carers to engage with digital and online services. Examples include: Initiatives like the Good Things Foundation's national device bank and the Digital Skills Partnership pilot provided devices and connectivity, improving digital skills for 94% of beneficiaries. Future Digital Inclusion helped over 1 million people enhance their digital skills, leading to job opportunities. Around 1,000 organisations have become local data bank partners to support connectivity challenges.

Digital hubs and volunteers: Inclusive community spaces (hubs) with trained volunteers to facilitate access to online resources and develop digital skills. Examples include: Nailsea Town Council, which offers a community space for digital skill support, and the Widening Digital Participation Programme's community digital health hubs that assist socially and digitally excluded individuals, including refugees and asylum seekers, in accessing online health information (Age UK, 2023; Lewzey, 2022).

Working with partners and community assets: Leveraging existing resources, partnerships, and collaborations across sectors.

Accessible training: user-friendly, jargon-free, and cost-effective digital skills training in short, simple sessions is deemed beneficial. Language matters! Examples include: Widening digital participation programme that worked with carers to address digital exclusion, involving 285,164 people. In its second phase, 21,178 individuals participated, including 824 with lived experiences contributing to co-design and user insight sessions.

Information and advice: A single source of regularly updated, unbiased and easy to understand information and advice would help.

Maintaining offline options: Digital by choice and the importance of traditional in-person services for individuals facing barriers to online access, especially those with complex needs (Hamblin and Black, 2023; Rousaki et al., 2024).

Even once the right technology has been chosen and issues around ethics and inclusion have been addressed, it is then difficult to **capture evidence of technology's outcomes** in relation to care. Several large-scale studies of first and second generation telecare (pendant alarms and environmental sensors) did not find that these devices reduced costs, hospital admissions or greatly enhanced the wellbeing of people receiving care or carers

(Henderson et al., 2014; Hirani et al., 2014; Steventon et al., 2013; Gathercole et al., 2021). The Kings Fund highlighted:

> *"Finding conclusive evidence of the benefits is difficult. Things are complicated by the fact that some studies may be evaluating an imperfect implementation, while others may be highlighting a problem with the technology itself. Technology is also being adapted and changed constantly and so the solution and its use within an organisation at the start of an evaluation can potentially be very different at the end of it"* (Kings Fund 2018, p. 12; see also Zignate, 2020).

Box 6: Evaluating TECS- existing practices and examples

Evaluating Technology Enabled Care (TEC) can be challenging due to the fragmented nature of existing frameworks, which are often too focused on specific contexts or technologies. Ariss et al. (2024) suggest creating a comprehensive evaluation framework, due to the need for a single, unified approach that can be used across different TEC projects. To meet this need, they propose the Consolidated Evaluation Framework for Technology Enabled Care (CEFTEC), which would be broad enough to cover both the innovation and its implementation, and would be easy to understand for a wide range of people, including those without expertise in health technology.

While there are existing frameworks like the NICE Evidence Standards Framework (ESF) and the NASSS framework (non-adoption, abandonment, scale-up, spread, and sustainability), these have limitations, especially when dealing with the complexity and scalability of TEC in social care. As a solution, Ariss et al. (2024) suggest a five-part evaluation framework that combines elements from these existing frameworks, budget impact assessments, practical examples, and a simple logic model. This framework aims to provide thorough evaluation evidence that can be compared across different TEC initiatives (Cox & Sadler, 2024).

Ariss et al. (2023) stress the importance of considering factors like implementation complexity, scalability, and sustainability. They also highlight the need for economic and system-level impact assessments to ensure that TEC projects are effective and viable in the long term. One major challenge is the gap between academic evaluation methods and the practical needs of service providers. The proposed framework aims to bridge this gap by combining thorough academic analysis with practical usability.

Case studies are sometimes used to evidence the financial benefits or efficiencies generated by using technology in care, and the Institute of Public Care (2021) has noted there is the need for more independent research, not linked to technology companies or care providers. There are also discussions about **which – and whose – outcomes are the most important**. Some have questioned whether the use of technology in care often focuses on managing risk or to save costs, rather than broader ambitions around supporting people's wellbeing (Hamblin, 2023); others have questioned whether what people who

receive care and support want from technology-enabled care, always aligns with what commissioners or services or designers of technologies think they would want (Gibson et al., 2015, 2019; Lynch et al., 2019). Studies have argued that sometimes the outcomes people receiving care feel are most important are not at the forefront of decision-making related to technologies and care (Lynch et al., 2019), which can then create a barrier to use (Berge, 2016).

Co-production has been proposed as a means to create technologies and services that are more closely aligned with what people receiving care and support want. According to a review by Rolfe et al. (2023) there is more research employing co-production during the design phase of assistive technologies, with fewer studies focusing on the implementation phase. Common methods of co-production include workshops, focus groups, interviews, cultural probes, observations, and surveys; involving older adults, family members, and professionals from health, social care, and technology sectors. Co-production enhances engagement and ensures that solutions are tailored to the needs, capacities, and living situations of older adults; however, it needs to be flexible and adopt approaches to co-production to accommodate the diverse circumstances of older adults. However, it is not always easy; it entails cultural, institutional, and practical challenges, alongside risks related to participation and responsibility.

Having read the material above, in the first Local Network Meeting, we'd like you to discuss:

Your experiences…

- Would anyone like to share their experiences of using technology in care, either as a person who receives support, a carer, a care or service provider?

Thinking about this discussion document…

- Does anyone in the group have experience of any of the technologies included in the document (e.g. technology-enabled care, smart devices, AI, robotics?)?
- Were there any ideas in this document that you thought were interesting and could support independence or prevention, or other outcomes?
- What did you think about the challenges identified? Any that were missed? What do you think would help to address these challenges?
- Anything in the document you didn't agree with, or didn't match your experience?

Next steps…

- Are there any next steps you'd like to agree as a group? Anything you'd like to discuss?
- Do you think there is anyone else who should be involved in your meeting?
- Is there anything you need from the IMPACT team?

Glossary of terms

Technology-Enabled Care Services (TECS)	Services and devices that use technology to support individuals in receiving care, aimed at promoting greater independence and prevention in adult social care.
Artificial Intelligence (AI)	Devices and systems that simulate human intelligence and have problem-solving capabilities. They are used in social care for tasks like chatbots, predictive analytics, and administrative functions.
Internet of Things (IoT)	A network of devices that might use sensors and software; often exchanging data with other devices through the internet. In social care contexts, they are used for support and monitoring.
Smart Devices	Technologies such as smartphones, smart speakers, tablets, and wearable sensors that can be used in care to improve health and wellbeing, reduce carers' responsibilities, and promote independence.
Digital Switchover	The process of transitioning from analogue to digital telecommunications connections, affecting TEC devices and systems that need to be replaced by digital alternatives.
Telehealth	The delivery of health-related services and information via telecommunications technologies, allowing for remote monitoring, consultation, and treatment.
Co-production	A method of creating technologies and services by involving older adults, family members, and professionals from health, social care, and technology sectors in the design and implementation phases.

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