



Housing LIN

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Technology and Digital Connected Care Services: Towards the tipping point?

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Written by **Clare Skidmore**, Strategic Lead: Influencing and Networks at the Housing Learning and Improvement Network



Summary

In 2017, the Local Government Association published a report, authored by the Housing Learning and Improvement Network (LIN), entitled 'Housing our Ageing Population'¹ – providing a survey of some of the best examples of where councils are meeting the strategic housing needs of their ageing population, and enabling people to live in their own homes (whether in mainstream or specialist housing) for as long as possible. Subsequently, the Housing LIN provided detailed support to a select number of two-tier and unitary councils in England under the LGA's Housing Advisor Programme.

One theme which surfaced to a limited degree in that work was the role of technology and digital enabled care and support services in meeting the current and future housing, health and care needs of older people. Within that context, the purpose of this paper is to address this topic in more depth, based on a brief (mainly grey) literature review; and to explore the barriers to, and opportunities for the mainstream rollout and embedding of digital technology in order to improve outcomes for people. The key question under consideration is '*What is the tipping point for true digital transformation of health, housing and care services?*'

1 <https://www.housinglin.org.uk/Topics/type/Housing-our-Ageing-Population-Learning-from-councils-meeting-the-housing-needs-of-our-ageing-population/>

Background

“Healthcare is the last industry that has not adopted digital technology in any major way to help deliver its services. And it’s becoming challenging for physicians and consumers to actually manage care without those digital tools.”

- David Schlanger, CEO, WebMD²

“The first thing we ought to recognize is that mobile is now part of the fabric — every day in everybody’s life. So if you’re not looking at mobile solutions, then you’re not really looking at all solutions.” Mal Postings Global CTO

- IT Advisory Ernst & Young³

Our world and daily lives have changed almost beyond recognition over the past 30 years, driven by the radical evolution of digital and online technologies, communications systems and digital media. Whether shopping, listening to music, communicating with our friends and family, planning a holiday, or running a business, our lives as we live them now would, in many respects, be almost unrecognisable to our immediate forebears.

However, one key area which, until very recently, has not transformed significantly within this period, is the role of digital in the worlds of health, care, supported housing, and the provision of telecare into people’s own homes. We still, for the most part, interact with our health practitioners in dedicated premises, such as hospitals, GP surgeries and clinics. Many sheltered and supported housing schemes still do not have full wi-fi available into all residents’ apartments. When we do use technology-enabled care and assistive devices in our own homes, much of the equipment currently being used at scale on a population level (which, as far as it goes, often continues to serve us very well) has not changed significantly in decades. For example, social / community alarms, similar to the push button Telecare devices used in many homes today, were first installed in the 1970s. The first automated access doors were adapted for the use of disabled people in the 1970s⁴, and the first stairlifts were installed for people with mobility impairments in the US in the 1920s.⁵

In short, the major developments in digital technologies – such as social media, digital communications, big data analytics, and smart homes technology – do not, to date, seem to have impacted significantly on the world of health, housing and care, and on people’s everyday experience of using these services at home, despite a lot of hype and excitement on the margins – with a few isolated exceptions. Across all three sectors, there are many promising projects, pilots, and short-term funded initiatives, but very few true examples of transformation at scale. This seems, at first glance, puzzling, and inspires some pressing questions: ‘What are the barriers for widespread adoption of digital technology in housing, health and care services? *What is the tipping point for digital in these sectors?*’

2 <https://carrothealth.com/surfing-3-waves-digital-healthcare/>

3 <https://klara.com/blog/12-best-quotes-on-the-future-of-healthcare>

4 <https://www.automaticaccess.co.uk/blog/the-history-of-automatic-doors/>

5 <https://www.stannahstairlifts.co.uk/articles/who-invented-the-stairlift/>

Brief History of Telecare and AT in the UK

As referenced above, basic community / social alarms have been in use in people's own homes for decades, enabling older and disabled people to continue to live independently at home by being able to summon help should an incident occur. They have been a core component of sheltered housing environments for all of that time. In more recent years, other sensors and devices have been added onto the basic community alarm system, enabling additional functionality – such as environmental sensors and devices which enable users to move around their home and use their kitchen more safely, or remind people to take their medication. Meanwhile, a range of electronic devices have been widely available for decades to enable disabled people to live their lives, such as stairlifts, door openers, ramps and lifts (for example).

Recognising the potential for telecare to serve as a significant enabler in the social care context, in 2005 the Department of Health published 'Building Telecare in England' and the 'Preventative Technology Grant' (with £80m available between 2006-2008), providing funding and encouragement for all local authorities to invest in technology as part of a strategic approach to the transformation of social care. Indeed, as of May 2010, between 1.6 million and 1.7 million people in England were using some form of telecare – although these were still predominantly pendant alarms.⁶

A barrier to more widespread adoption of technology enabled care has often been cited as being a lack of evidence about its efficiency and efficacy⁷. Recognising this barrier, in 2011 the government initiated the 'Whole System Demonstrator' (WSD), described as 'the largest randomised control trial of telehealth and telecare in the world'. The following definitions were offered: 'Telehealth requires active participation of patients to measure vital signs using peripheral devices, whereas Telecare monitors without the need for patient input.'⁸

The WSD was implemented across three sites, Kent, Cornwall and the London Borough of Newham, covering more than 6,000 patients. Initial, headline results were very promising, claiming that telehealth led to significant reductions in both hospital admissions and mortality. Indeed, the government drew on the results to justify its Three Million Lives campaign⁹, establishing a commitment to collaborate with industry, NHS and social care to embed telehealth as a mainstream service. Disappointingly, the published findings from the programme¹⁰ concluded that:

- *'Telecare as implemented in the WSD trial did not lead to reductions in service use, at least [not within] twelve months';*
- *'A package of second-generation TC equipment and associated monitoring service did not constitute a cost-effective alternative to usual care';*

6 <https://www.kingsfund.org.uk/sites/default/files/Sustaining-innovation-telehealth-telecare-wsdan-mike-clark-nick-goodwin-october-2010.pdf>

7 <https://www.kingsfund.org.uk/sites/default/files/telecare-older-people-wanless-background-paper-teresa-poole2006.pdf>

8 https://www.city.ac.uk/__data/assets/pdf_file/0003/243066/WSD_Exec_Sum_28th_20Aug.PDF

9 <http://3millionlives.co.uk>

10 *'Effect of telecare on use of health and social care services: findings from the Whole Systems Demonstrator cluster randomised trial'* – Steventon et al, *Age and Ageing*, Volume 42, Issue 4, 1 July 2013, Pages 501–508, <https://doi.org/10.1093/ageing/aft008>

- *'Costs for the TC group, including intervention costs, were £1014 higher per annum than the control group in the principal analyses';*
- *'WSD and many other studies failed to find any improvement in quality of life' as a result of using telehealth, and that*
- *The study failed to evidence '... support for the introduction of TH on the basis of cost effectiveness using NICE guidelines specifying the threshold required'.*

Since the publication of the WSD report, various theories have been offered for why the evaluation failed to find robust evidence for the benefits of telecare and telehealth in NHS and social care systems. Potential hypotheses include:

- Falling equipment cost between the time when the WSD was first initiated, and the time of the evaluation, may have led to skewed historic cost effectiveness data¹¹.
- The general need for organic evolution during the implementation of a complex innovation such as remote care, relying on ongoing responsiveness and adaptability from the local health and social care system, was not always aligned with the imperative, through the evaluation process, to gather robust benefits evidence¹².
- The study did not consider pre-existing good practice in the three local authorities in which data was collected¹³.
- The evaluation coordinators did not prescribe the 'intervention' (local authorities were free to assess for and deploy telecare as they saw fit) and so samples could have contained an unknown number of people for whom telecare might reasonably not be expected to make a measurable difference over the intervention period, (because of variation in their level of need at the time they were recruited to the trial)¹⁴.
- The intervention period itself might not have been long enough, since the trial followed up trial participants for only 12 months¹⁵.
- Arguably, there may have been an insufficient focus on the need to transform the whole system within which the technology was being used, rather than simply bolting new technology onto an otherwise unchanged system – whether in terms of human behaviour, attitudes, policies and care pathways¹⁶.

It is possible that for a time, the perceived 'failure' of the WSD may have contributed to reduced confidence in the transformative role of technology in English health and care systems, although in other ways, as observed by the King's College 'Utopia' project team in 2018, *'the WSD findings*

11 <http://telecareaware.com/telehealth-soapbox-time-to-bid-farewell-to-the-wsd/>

12 <https://www.kcl.ac.uk/sspp/policy-institute/scwru/res/utopia/index.aspx>

13 Ibid.

14 Ibid.

15 Ibid.

16 <http://telecareaware.com/telehealth-soapbox-time-to-bid-farewell-to-the-wsd/>

do not seem to have influenced local authorities and policy makers. The WSD remains an important study and its neglect is curious.¹⁷

The apparent 'neglect' of the WSD findings was one of the main drivers behind the Utopia research project, aiming *'to explore whether it might be the ways telecare is provided and used, rather than telecare itself, that could account to some extent for WSD findings'*. The Utopia research findings were therefore based on extensive interviews and surveys with local authorities and providers, and some of the findings are summarised later in this paper.

After the WSD, the government subsequently made another attempt at demonstrating the evidence base for telecare and telehealth, via the so-called 'Dallas' project, which ran between 2012 - 2015.¹⁸ Dallas had the mission of benefiting 169,000 people across the UK by 2015 by giving them access to innovative health and care technologies. Unlike the WSD, there was no randomised control trial and the project was user focused. The evaluation of this programme highlighted a number of key findings, which though helpful in informing future service design, still did not provide straightforward evidence for the benefits of widespread implementation:

- The readiness of the whole health / care system was identified as a success factor in rolling out digital care services at scale (and conversely, as a barrier, if not in place).
- The evaluation found that it was difficult for teams to deliver and innovate at the same time; some headroom needed to be built into workflows.
- The researchers noted that a health app or online personal health record would only be rendered useful if offered alongside reliable access to wi-fi.
- The study recommended that for telecare and telehealth to fulfil their transformative potential, systems must become interoperable -not necessarily an outcome which individual manufacturers may consider commercially beneficial.

There have been other evaluations of technology-enabled care in recent years, some of which demonstrate significant benefits for health and care systems and for individual outcomes for people; however, these have tended to be undertaken on a localised, pilot basis (for examples, see the Blackburn with Darwen and Hillingdon Borough Council projects¹⁹). Meanwhile, it still does not appear that we have yet reached the 'tipping point' in terms of large-scale system transformation in health and care, linked to digital innovation, even as the wider world strides on ahead into the digital future.

Where we are now

Overall, we are now at a point where established technology does play a key role in enabling disabled and older people to live safely at home, but where real signs of innovative digital transformation mainstreamed at scale are few and far between, though many promising initiatives and projects (often time limited) are under way at a local and organisational level. It is widely recognised that in order for real transformation to be achieved, wider system and culture change is needed, well beyond the adoption of technology itself.

17 <https://www.kcl.ac.uk/sspp/policy-institute/scwru/res/utopia/index.aspx>

18 <https://www.tsa-voice.org.uk/news/dallas-telehealth%E2%80%99s-reboot-reviewed>

19 <https://www.local.gov.uk/sites/default/files/documents/telecare-and-assistive-te-e36.pdf>

“The notion that simply discharging patients with some technology will prevent readmission or ensure positive outcomes is more wishful thinking than reality.”

- Chilmark Research²⁰

Looking at recent surveys of the housing and care sector, it seems that persistent barriers to major digital transformation include the ongoing lack of integration across housing, health and care systems more widely (including data, care pathways and working practices); skills and knowledge deficits among staff; a lack of strategic commitment to digital transformation; and a continuing confusion about the evidence base for its efficacy and efficiency in delivering improved outcomes and / or reduced system costs.

With respect to the adult social care (commissioning and provider) sector, the Kings College London UTOPIA research project found in 2018²¹ that:

- Only 24% of respondents said that their telecare strategy had been produced in collaboration with NHS / other partners.
- 47% of respondents saw telecare as being a possible social care substitute, but also as a 'gateway' service (44%) as a potential way of delaying need for care.
- Priority uses of telecare included to delay and reduce the need for care and support (97%), to enhance quality of life for people with needs for care and support (90%), to help with safeguarding (85%) and to prevent carer breakdown (84%).
- Identified barriers included skill deficits amongst staff to assess for and install telecare, and inflexibility of contracts with existing suppliers of technology.
- 24% of respondents estimated that the use of telecare saved money, although respondents found it difficult to provide hard evidence for this.

Meanwhile, in the housing and care sector, research by Appello, published in September 2018 in collaboration with the Housing LIN²², found that:

- While the majority (93%) of housing providers believed that digital will be 'critical for future success', especially with the forthcoming analogue switch off in 2025, many (44%) were not yet ready for transformation.
- Almost 12% of housing provider respondents stated that their current telecare provider was unable to monitor digital, highlighting a gap in the market for end-to-end digital solutions providers.
- Further to this, 9% of housing providers still had no digital plan in place; 7% were not aware of digital solutions; and 7% did not see digital as part of their current strategy.

20 <https://www.mobihealthnews.com/content/chilmark-many-hurdles-still-remain-remote-patient-monitoring>

21 <https://www.kcl.ac.uk/sspp/policy-institute/scwru/res/utopia/index.aspx>

22 <https://www.housinglin.org.uk/News/New-Digital-Care-White-Paper/>

These survey results raise some concerns about the skills and capacities of the care and housing workforce to understand and make the most of the potential of digital services to improve outcomes for people who are supported by health, care and housing services. In 2014, Skills for Care observed that *'it is clear that there is a mixed understanding among local authority commissioners and wider stakeholders on what ALT [Assisted Living Technology] and ALS [Assisted Living Services] are and what role they can play in supporting the delivery of adult social care outcomes'*.²³

Indeed, in terms of the workforce more broadly, Skills for Care has also stated that: *'While digital skills are recognised as a core functional skill in the learning and skills sector, the current social care workforce training and qualifications frameworks do not address digital capabilities in any significant way.'*²⁴

In their 2016 report, 'Is housing really ready to go digital?'²⁵, HACT also identifies knowledge and expertise gaps in housing, especially at the highest levels, stating that *'... boards rarely have a board member or members recruited on the basis of tech-literacy or recent experience of technology in a business context... there is an over-reliance on external consultant-led change... [representing] a major barrier to the adoption of effective approaches to digital transformation.'*

At the same time, a number of other potential factors may also come into play.

First, it appears that mainstream technology developers (e.g. Amazon / Google / Apple etc) have not yet come to see people with care and support needs as a key customer segment - although the general health and 'wellness' market is huge (note the rise of the 'Fit Bit', online dieting and smoking cessation tools, and meditation apps for mental health). Hargreaves, T (2013), in a survey of the target market of 'smart home' technology companies²⁶, noted that:

'Aside from a few niche applications e.g. for disabled or elderly users, the marketing materials tend to target a general purpose audience and do not differentiate to any great degree between potentially different categories of user'.

Second, as noted above, a key barrier has always been the wider system, as much as the technology itself - e.g. who physically responds to emergency calls? How to manage the potential high number of false alarms? How to effectively signpost telecare users, if the monitoring centre does not have access to all their health and care records? How to make best use of all the data which can be - or indeed is - collected, to inform better designed or more personalised housing and care services? In general, the wider health, care, local government, and housing system has been slow to adopt digital transformation, which creates a wider cultural and systemic barrier to adopting digital and mobile solutions on a larger scale.

23 <https://www.skillsforcare.org.uk/microsite/cat/SkillsForCare/media/SFC-Media/Images/Commissioning-Assisted-Living-Technologies-Guidance-ext=.pdf>

24 <https://www.skillsforcare.org.uk/Document-library/NMDS-SC,-workforce-intelligence-and-innovation/Research/Digital-literacy/Digital-Capabilities-Survey-Report-300314-FINAL.pdf>

25 <https://www.hact.org.uk/sites/default/files/uploads/Archives/2016/12/HACT%20-%20Is%20Housing%20Really%20Ready%20To%20Go%20Digital.pdf>

26 https://www.eceee.org/library/conference_proceedings/eceee_Summer_Studies/2013/6-appliances-product-policy-and-ict/who-uses-smart-home-technologies-representations-of-users-by-the-smart-home-industry/

Indeed, Housing LIN (unpublished) research suggests that for councils which have not embedded newer digital technologies across their other functions (i.e. beyond social care), major transformation in this area becomes a challenge, because of a lack of in-house expertise, internal inertia and the need for double-running during transitional periods.

Third, with a few exceptions, the people who know about care and support, and the people who know about technology, are not generally very familiar with one another, and often do not understand each other's world or market, again echoing the skills and workforce concerns outlined above. Housing LIN experience suggests, for example, that social care commissioners rarely specify the technology requirements in extra care or supported housing in detail; it is typically viewed as the responsibility of the housing /care provider to design and deliver this element.

Meanwhile, in many instances the specialist telecare providers seem to view commissioners and providers, rather than end users, as their key target consumers. Anecdotally, many telecare companies do not even routinely consult with or market test products directly with end users (rather, they target commissioners or housing providers as a route to market testing). This seems to be a significant weakness in the current approach taken by many leading soft- and hardware developers, manufacturers and suppliers.

"You have to understand what are [users] are worried about, what are their fears, what are they trying to do? If we don't engage with them that way, it doesn't matter what technology we use."

- Roy Rosin, Chief Innovation Officer, Penn Medicine²⁷

With the increasing importance of self-funders in the adult social care market, with more people paying for their own care (a trend which is only likely to increase in the future), this reluctance to engage directly with end-users seems puzzling.

Perhaps as a result of these disconnects, there has often been an attitude which could be characterised as 'here is a really clever device or system, how might it help?' rather than 'what problems do you face in your daily life, or in your patients' daily lives' – and starting from there.

"... [many pure technology software solutions] are created in a vacuum or rejiggered from something a health plan needs, or something someone else had laying around. They don't really understand the needs of [healthcare] practices..."

- Dr. Farzad Mostashari, CEO, Aledade²⁸

Finally, it is important to note that across housing, health and care, and indeed the wider public sector infrastructure, we have experienced a prolonged period of austerity and severe financial challenge, for nearly a decade (with, as yet, little relief in sight). Within this climate, it is challenging to do more than focus on immediate crises, and instead – or at the same time – to pursue innovation and attempt strategic transformation in the long term. Nevertheless, such are the efficiencies, as well as improved outcomes, which have been seen across the rest of the economy through full adoption of digital technologies, it could be argued that it will cost our sectors dear in the long term if we do not follow suit.

27 <https://www.usa.philips.com/healthcare/education-resources/copd-insider/bridging-the-digital-divide>

28 <https://www.mobihealthnews.com/content/77-2015s-most-interesting-digital-health-quotes>

Key Policy and Funding Opportunities

Adult Social Care Green Paper and the NHS 10-Year Plan

It is anticipated that the adult social green paper, when it is published, will have a strong focus on the importance of quality housing in terms of its impact on positive health and wellbeing, and also on the role of technology in the transformation of social care, and in the embedding of more personalised care for people in their own homes, including extra care and specialist housing settings. Equally, the NHS 10 Year Plan is expected to incorporate a strong emphasis on the role of technology and digital in the transformation of the NHS.

Indeed, the government's robust and wide-ranging commitment to the transformative potential of technology ('healthtech') is set out in more detail in 'The future of healthcare: our vision for digital, data and technology in health and care'²⁹, published by the Department of Health and Social Care (DHSC), published 17th October 2018.

The document highlights (among many areas) the critical importance of understanding user needs, as well as highlighting the need for interoperability, establishing common data standards, ensuring data security, improving tech knowledge and skills across the health and care workforce, and encouraging innovation. The vision ranges from the most basic IT 'building blocks' underpinning our health and care infrastructure, to enjoying the benefits of cutting-edge technology - for example, robotics and Artificial Intelligence (AI).

NHS funding for digital technologies in healthcare

On 20th July 2018, the Secretary of State for Health and Social Care announced a half billion-pound package to fund digital technologies in the NHS. £400 million will go towards new technology in hospitals to make patients safer, improve efficiency, and help more people access health services at home, including the development of preventative pathways.

Given the expected emphasis in the new NHS Plan and Adult Social Care Green Paper on the integration of health and social care, it seems likely that this may herald a significant opportunity for investment in new telehealth and telecare initiatives.

The Government's Industrial Strategy - Ageing Grand Challenge³⁰

This Challenge aims to '*harness the power of innovation to help meet the needs of an ageing society*'. Among other objectives, and working closely with Innovate UK, the mission aims to '*build markets*

29 <https://www.gov.uk/government/publications/the-future-of-healthcare-our-vision-for-digital-data-and-technology-in-health-and-care/the-future-of-healthcare-our-vision-for-digital-data-and-technology-in-health-and-care>

30 <https://www.gov.uk/government/news/government-announces-300-million-for-landmark-ageing-society-grand-challenge>

for consumer products and services that better meet the needs of older people' and also to 'drive improvements in public health and innovate across the public sector' - with £98m to be invested in innovation to support these objectives.

Further developments emerging from the Challenge are likely to incorporate engagement with councils and / or housing providers, and lessons learned from the Challenge may inform future progress in this area.

Confirmed funding for supported housing³¹

In August 2018, after several years of uncertainty, the government confirmed that the funding arrangements for all those people living in supported housing would remain 'in the welfare system', providing long term revenue funding security for providers and commissioners of supported housing. While a further review is expected, it is to be hoped that among other positive outcomes, this certainty of funding will give housing and care commissioners and providers the confidence to take a fully strategic approach going forward, with full consideration given to the role of digital enabled services in key aspects of their business, including the delivery of care and support services, and integration across health, housing and care systems.

MHCLG funding for council's digital innovation³²

Councils seeking to transform their public services through digital innovation were invited to apply to a new £7.5m fund from Monday 24th September 2018. Applications are invited from local authorities, to change the way they invest in technology, share expertise and ensure members of the public receive the best quality digital services from their local council.

Grants of up to £100,000 will be available for projects which demonstrate they benefit local public services and have the potential to be rolled out more widely across the country. Deadline for expressions of interest was 5th October 2018.

The government is also encouraging councils to sign up to a 'Local Digital Declaration', to build on each other's work to revolutionise public services. MHCLG have established a new team to work with councils to help them deliver on their declaration commitments.

Local Government Association (LGA) Digital Transformation Fund³³

The fund was set up to help councils develop digital solutions to support national programmes of transformation. Projects include the integration of data to support population health, and digitalising a community referral service for health and wellbeing. Themes covered include the use of digital to communicate with residents and enable online self-service; integrate data across

31 <https://www.gov.uk/government/news/all-supported-housing-funding-to-be-retained-in-welfare-system>

32 <https://www.gov.uk/government/news/75-million-fund-for-councils-digital-innovation-opens>

33 <https://www.local.gov.uk/digital-transformation-programme>

organisations; improve workforce management; and use customer insights to inform service planning (for example).

With relevance to health and social care, there is support for councils' response to population ageing, including identifying those most in need; data analytics informing the commissioning and management of care packages; supporting community-based care; health and care system integration; and providing information about sources of local support.

LGA Social Care Digital Innovation funding³⁴

As part of the LGA's Local Investment Programme, funded by NHS Digital, 31 councils (to date) have each received up to £50,000 towards projects using digital technology to transform health and care. Themes including sharing information and integrating services; enabling people to interact with care services through digital channels; promoting independence and wellbeing; improved commissioning through use of data and analytics; and enabling care professionals to work in a more flexible, mobile way.

The concept of 'Smart Cities' and Future Cities Catapult³⁵

The aim of Future Cities Catapult is to help UK firms develop innovative products and services to meet the changing needs of cities, and to sell them to the world. Future Cities Catapult offers its services to help SMEs and start-ups to make the most of their potential to transform the urban environment. This includes a focus on promoting health and wellbeing, and age-friendly design, in the smart cities of the future.

Healthy New Towns³⁶

NHS England are working with ten housing developments across England to shape the health of communities, and to rethink the design and delivery of health and care services. The programme aims to bring together public health, NHS partners, planners and housing developers to plan and build healthier places. A key objective is to develop best practice, case studies and guidance to help ensure key principles are embedded in all new housing developments, promoting health and wellbeing and ensuring high quality health and care outcomes for residents. The role of digital technology is a key theme through all the projects.

34 <https://www.local.gov.uk/our-support/our-improvement-offer/care-and-health-improvement/informatics/local-investment-programme>

35 <https://futurecities.catapult.org.uk/>

36 <https://www.england.nhs.uk/ourwork/innovation/healthy-new-towns/>

The Future

It seems likely that the digital revolution will come to the housing, health and care sectors, albeit decades later than in society more generally. The *'Future of House and Home'* report, published by Shelter in 2016³⁷, highlights that the people who will be in their 70s and 80s in 2030 are in their 60s, or younger, today, and as a result, will certainly be more familiar with the digital world than many older people are now. Over time, the report predicts that the generational digital divide will fade, notwithstanding ongoing barriers to equal participation in the digital economy, such as the cost of access. They anticipate the rise of home monitoring technology, 'wearables', and telehealth in everyday life. Digital technology will be even more ubiquitous by 2030 than it is now, and personal devices will routinely engage with sensors and embedded digital tech. The tech world will also be more lightweight, based on phones and tablet-like devices rather than laptops and computers.

Reflecting on these predictions, one hypothesis is that the 'tipping point' in housing and care will finally come when Google / Apple / Amazon (and their descendants) start to market health and care outcomes to end users, including to people with disabilities and care needs - offering bolt on care-focused offers, added to existing smart home systems, which also deliver entertainment, environmental controls, etc. This may also help to reduce the stigma associated with assistive technology, particularly with the extra benefits that mass-market developers could offer in terms of aspirational, marketable design being part of the package.

However, in the long term, the potential offered by a new end-user driven market (ever-growing, due to the rising numbers of self-funders) will not be realised if our health, housing and care infrastructure is not in a state of readiness to make the most of any future 'tipping point' in user demand. For example, in the case of reactive Telecare, if response systems are not in place, this will remain a barrier, however effective the technology is itself.

37 https://england.shelter.org.uk/professional_resources/policy_and_research/policy_library/policy_library_folder/report_the_future_of_housing_and_home_scenarios_for_2030

Exemplary Practice - Housing, Health and Digital Care Collaboratives

'...The advance of technology is based on making it fit in so that you don't really even notice it, so it's part of everyday life.'

- Bill Gates³⁸

Salix Homes - MiiHome Project

Salford housing association Salix Homes has launched its innovative MiiHome project to trial smart home technology in the homes of its elderly tenants.

Working alongside Salford Royal NHS Foundation Trust, and the Universities of Manchester and Salford, the project aims to enable older people to live safely in their homes for longer and reduce pressures on the NHS and other care services. The long-term aim is to help older people with mobility and memory impairments to maintain their independence by monitoring their well-being, using artificial intelligence (AI).



Resident George Foster, taking part in the MiiHome, with Jonathan Drake

The MiiHome project has seen discreet sensors, such as Microsoft Kinect technology more commonly associated with the Xbox, fitted into the homes of a number of residents at Salix Homes' sheltered housing schemes, who have volunteered to take part.

The research studies are being co-created with residents, helping to design a system which is more likely to be welcomed into people's homes in future. If successful, it is hoped that this type of sensor technology will one day be embedded into the fabric of future homes.

<https://www.salixhomes.org/news/pioneering-smart-home-technology-keep-older-people-safe-their-homes-piloted-salford>

38 https://www.brainyquote.com/quotes/bill_gates_446483?src=t_technology

Southend-on-Sea Borough Council technology enabled care initiatives

In summer 2017, the council began to engage with suppliers to explore the role of technology in delivering enhanced care, with four aims:

1. Reduce numbers of GP visits caused by 'loneliness and social isolation'
2. Cut A&E admissions from 'underlying long-term conditions'
3. Enable people living with long-term conditions – particularly respiratory problems – to self-manage their care regime, with the intervention of professionals triggered by automatic alerts
4. Find technology to support older people to live independently for longer.

One innovation, announced in October 2017, was a project to buy and use 'Pepper', a small humanoid robot, under an academic licence, to support work with people living with dementia and others, including in sheltered housing settings. The plan was to use Pepper in intergenerational projects with older and younger people, and to deploy him as champion for the advances that digital and robotic technology can make in social care.

<https://www.govtechleaders.com/2017/08/15/council-looks-to-technology-enabled-care-to-transform-health-and-social-care-delivery/>

Bromford Lab Social Prescribing

Bromford Lab is an initiative of the housing provider, Bromford, aimed at promoting and enabling innovation in order to 'unlock the potential in communities', working across housing, health and care. Committed to the principle of user-centred design, one project is being developed in partnership with Elemental, a social prescribing start-up. They have been commissioned by the West Midlands Combined Authority to help make the West Midlands a better place to live and work by understanding more about:

- The role of digital technology, and digital platforms, in improving health and well-being outcomes, including improved mental health, across the West Midlands
- How to support people to live well through better connectivity, personalisation and self-directed support methods

Using Elemental Software, Neighbourhood Coaches will make social prescribing referrals to a range of community organisations, including money and other advice services, in under 60 seconds. A cloud-based solution, it enables practitioners to track and monitor the impact of a referral in real time, allowing for accurate reporting and quantifiable metrics.

<http://www.bromfordlab.com/lab-diary/2018/5/23/social-prescribing-and-neighbourhood-coaching>

L&Q Alcove

Alcove provides personalised packages of assistive technology ('not just sensors') for people who want to live independently at home, but need support to do so. They also work with councils, Retirement Village developers and Housing Associations 'looking for a 21st Century version of Telecare'.

L&Q partnered with Alcove to embed telecare across four supported living schemes, supporting people with a range of needs, including learning disabilities, and complex needs. One scheme is fitted with over 50 devices, including movement, heat, light, eating sensors, Alexa, and Alcove's video calling carephone devices. The technology, and the data generated, has enabled more personalised care for the people living in the schemes, and also provided a waking night shift care saving to the local authority. The CQC highlighted that *"positive risk taking was driven through the safe use of innovative and pioneering technology in order to support people to live fulfilling lives"*.



Alcove care technology equipment

<https://www.youralcove.com/blogs/news/use-of-alcove-caretech-enables-outstanding-cqg-rating-in-housing-association-disability-scheme>

Blackwood Group, Scotland

Blackwood Group, a housing and care provider in Scotland, are investing in new technology, high quality services and aspirational design. Through co-designing with their customers, they aim to develop and deliver a truly personalised housing and care service.

At the heart of their programme of innovation is 'Cleverclogs', their digitally enhanced care system, which aims to keep people independent, in control and in their own home. Centred around a touch screen home hub, now installed in nearly 100 homes across Scotland, the system enables people to stay in touch with friends and family, access information, pursue their interests, and receive convenient reminders of any appointments or medication. It enables Blackwood Group to build bespoke care and response services, personalised around all aspects of the person's care, housing and support needs.

<https://www.blackwoodgroup.org.uk/clevercogs>

Albyn Fit Homes

The Fit Home initiative is a joint programme of work undertaken by Albyn Housing Society, Carbon Dynamic (a manufacturer of sustainable, modular homes) and NHS Highland in collaboration with local residents and health and social care partners. The aim is to provide housing solutions that enable people with care and support needs to live as independently as possible for longer, taking charge of their own wellness, self-managing their own support as much as possible, and making their own choices.



Preview of the technology-enabled 'Fit Home' concept

Attractive and aspirational in design, the homes are highly practical, flexible, and fully technology enabled, promoting wellbeing and enabling preventative health solutions - up to and including end of life care. Residents will benefit from digital health and assisted living technologies to an unprecedented extent.

<http://www.carbondynamic.com/fit-homes/>
<http://www.in0v8.scot.nhs.uk/fit-homes/>

Liverpool Safehouse

The Liverpool Safehouse project, funded by Innovate UK, was delivered jointly with Liverpool City Council and a number of housing associations in the city. 2000 homes in Liverpool were fitted with Safehouse devices, which included unique sensor technology to monitor temperature, smoke and fire alarms, humidity, movement, and light, and linked to a city-wide low power radio network. Advanced analytics, working with Microsoft Azure systems, were used to improve the delivery and effectiveness of care services.

Housing Associations were able to log in directly into individual Dashboards to view the data through a range of visualisations. Care providers were given access to a mobile phone Application called Safehouse. Partners were able to receive care and environment related notifications, manage responses and communicate amongst one another.

The project concluded on 31st March 2018. Safehouse is now a commercially available service.

<https://www.safehouse.technology/building-maintenance-social-care-pi>

Nottingham City Homes

Nottingham City Homes are using assistive technology to help people avoid being admitted into hospital. The right technology and devices can help a person get home from hospital more quickly, and can then play an important role in supporting them to remain at home for longer. A mobile response service is provided, helping to reduce the number of ambulance call outs and the resulting hospital admissions.

The service also includes telehealth services which enable people to monitor their own health conditions at home, thereby reducing demand on GPs and primary health care services. Telehealth can warn health professionals of changes in a person's health conditions, allowing timely, sometimes life-saving treatment to be provided.

<https://gtr.ukri.org/projects?ref=133400>

<https://www.housing.org.uk/partnership-case-study-assistive-technology-by-nottingham-city-homes/>

For other best practice, information and support, see:

<https://www.housinglin.org.uk/going-digital/>

<https://www.housinglin.org.uk/Topics/browse/HousingOlderPeople/OlderPeopleHousingProvision/Telecare/>

<https://www.vodg.org.uk/wp-content/uploads/2013-VODG-Assistive-technology-report.pdf>

<https://www.housinglin.org.uk/Going-Digital/>

<http://www.catch.org.uk/projects/>

<https://www.hact.org.uk/future-assisted-living-technology-0>

<https://www.skillsforcare.org.uk/Topics/Assistive-living-technology/Assistive-living-technology.aspx>

<https://www.skillsforcare.org.uk/Topics/Digital-skills/Digital-working.aspx>

Key outcomes - Summary

In conclusion, some of the established and emerging applications for digital technologies in home-based health and care applications can be summarised in relation to a number of major themes, as the software becomes more advanced and sophisticated:

- Telecare, enabling swift, reactive responses to emergency health needs, and to incidents and accidents in the home;
- Assistive devices to enable independent living around the home e.g. opening and closing windows, curtains, entertainment, environmental controls, mobility and movement, cooking and washing, etc.;
- Remote (telehealth) monitoring of vital signs and other health indicators to enable more effective and personalised support for people with long term health conditions;
- Lifestyle monitoring / home sensors to generate data and analytics to predict and prevent incidents, assess needs, and inform design of more personalised support;
- Digital solutions to enable social interaction and communication with others, and to support other engagement, such as virtual reality 'travel' and virtual group activities;
- Digital support to promote the wellbeing of people with dementia e.g. reminder devices, geo-tracking to support safe walking outside, automated sensors which act without the instruction of users (e.g. to turn on and off lights);
- Remote video / communication technology enabling people to access face to face advice and consultation with health and care professionals, without leaving home;
- The use of robotics, including humanoid robots, in supporting people with dementia and others to benefit from some positive care and support outcomes.

In the future, one could anticipate other transformative innovations emerging, such as *userCare*³⁹, 'CareBnB'⁴⁰ and other potential off-shoots, both of the tech start-up revolution, and of the 'gig economy'. There are many concerns and risks inherent in such developments, particularly in relation to the potential security and job satisfaction of future roles in care and support, and also around ensuring the safeguarding of people using the services, with questions about whether the delivery of good quality and consistency of services will be possible through such working arrangements.⁴¹

At the same time, with the growth of 'Shared Lives' and 'Homeshare' models of reciprocal support, as well as many timebanking, social enterprise, housing and community-led, and social prescribing initiatives, a range of new models of care are already emerging which are more person-centred, and based on individual, negotiated relationships, in their approach and outcomes. One could imagine that these evolving models would only be strengthened through the availability of new, mobile applications providing people direct and straightforward access to request and purchase tailored services and support requirements.

Hope for the Future

In addition to reflecting on the multiple individual examples of good practice and innovation across the country, some described in this paper (and more which are not), hope for the future could also be inspired by exploring the approach being taken by some tech innovators of Silicon Valley, right now.

A report from a recent Silicon Valley tech conference, sponsored by 'Aging 2.0', '*an organisation that supports innovators taking on the biggest challenges and opportunities in aging [sic]*' describes this conference as being '*different, by design*' – starting with its title, '*Seniors Shaping Technology: Your Opinion Matters*'.⁴² Next to each vendor booth, in the exhibition space, there was a voting station where older attendees could show their interest or approval of a particular product or service, organised in four quadrants: '*Cool, Will Buy, Not Sure and More Info Needed*'. In other words, asking older people what they really think, prefer, and value. It is to be hoped that this attitude will become contagious for us all.

'The key to digital transformation is changing the approach to the customer – give customers what they want.'

- Dave Sheridan, CEO, Keepmoat Regeneration⁴³

39 A company by this name, offering a flexible model of care access and delivery, is already up and running in Australia: <https://www.carecareers.com.au/employer/ubercare-services-pty-ltd>

40 See: <https://www.telegraph.co.uk/news/2018/03/01/carebnb-plan-revived-council-would-see-discharged-patients-stay/>

41 For a useful reflection on some of these very real risks and trade-offs, see: <https://neweconomics.org/2018/06/will-apps-help-carers-find-decent-work>

42 <https://www.nextavenue.org/cool-technology-trends-older-adults/>

43 <https://www.northern-consortium.org.uk/2017/06/02/digital-innovation-conference-blog/>

Top Tips

Following this rapid review of the literature and recent developments in digital enabled care and housing services, a number of key questions emerge which might be useful for strategic housing, care and health leads, commissioners, housing and care providers, and in some cases, digital / telecare developers and manufacturers, to ask of themselves:

- What is your state of readiness for the analogue switch-off in 2025⁴⁴? Do you have – or are you developing – a digital strategy in advance of this milestone?
- Have you undertaken a risk assessment of the shelf life of any telecare, digital and assistive technology equipment you rely upon to deliver your services? As contracts come up for renewal and the time comes for replacement, do you take the opportunity to ensure your digital infrastructure is fit for the future?
- If you are in the process of commissioning, designing, or building purpose-built housing and care, have you incorporated a commitment to HAPPI design principles? These include an expectation that the building of new homes for an ageing population should incorporate smarter ‘care aware’ design, ready for the delivery of digital care services.⁴⁵
- Looking at the wider context within which you are working, are you taking a strategic approach to planning holistically and for the long term, with tech and digital fully embedded as a golden thread throughout your entire vision for the future?
- In terms of knowledge and skills, are your workforce – including the leadership – fully digital aware, or are there key learning requirements which need to be met?
- How are you engaging with your customers / residents / end users regarding their future needs, priorities, and aspirations? Do you regularly undertake market testing with older people, and other people with care and support needs, to understand their interests and concerns?

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44 <https://www.techradar.com/uk/news/bts-plans-to-switch-off-analogue-phone-network-gather-momentum>

45 <https://www.housinglin.org.uk/Topics/type/Rural-Housing-for-an-Ageing-Population-Preserving-Independence-HAPPI-4/>

About the Housing LIN

The Housing LIN is a sophisticated network bringing together over 40,000 housing, health and social care professionals in England and Wales to exemplify innovative housing solutions for an ageing population.

Recognised by government and industry as a leading 'knowledge hub' on specialist housing, our online and regional networked activities:

- connect people, ideas and resources to inform and improve the range of housing choices that enable older and disabled people to live independently
- provide intelligence on latest funding, research, policy and practice developments, and
- raise the profile of specialist housing with developers, commissioners and providers to plan, design and deliver aspirational housing for an ageing population.

For more about the Housing LIN and our dedicated pages on innovative approaches to technology and telecare, visit: <https://www.housinglin.org.uk/going-digital/>

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c/o PRP, The Ideas Store
10 Lindsey Street, Clerkenwell
London EC1A 9HP

Email: info@housinglin.org.uk

Web: www.housinglin.org.uk

Twitter: [@HousingLIN](https://twitter.com/HousingLIN) & [@HousingLINews](https://twitter.com/HousingLINews)