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## Telecare at a crossroads? Finding researchable questions.

John Woolham, Paul Freddolino, Grant Gibson & Sarah Daniels

### Structure

This paper presents findings from a process of developing new research questions for telecare for older people and other groups. It begins with a brief definition of telecare and describes the emergence of newer technologies. Second, it offers an analysis of why telecare is at a crossroads due to the lack of evidence to support claims about its use despite its widespread adoption, and why, therefore, new researchable questions need to be asked and addressed. Third, it describes the objectives of a small scale study designed to develop this new research agenda. The methods used to do this are described in the fourth part of the paper. The findings are then presented and discussed before a final section offers some concluding observations and considers possible next steps.

### 1. Defining electronic assistive technology and telecare

Electronic assistive technologies are intended to ‘compensate for or alleviate an injury, disability or illness, or to replace a physical function’ (GOV.UK 2018). This definition is also used as an umbrella term, including devices designed to simply operate within someone’s home (for example, an electronic medication dispenser that can remind someone to take medication at pre-set intervals). Telecare is a specific form of electronic assistive technology that sends information remotely, usually to a call-centre, to trigger some form of social response (for example, a fall detector that may ultimately result in an ambulance being despatched). It can be ‘active’ (a device that only works if a user presses a button, for example) or ‘passive’ where sensors monitor the home environment and automatically send information elsewhere should the home environment, or a person’s behaviour, change (for example, if smoke is detected, if ambient temperature falls, leading to a hypothermia risk, or if no movement is detected in the dwelling over a certain period of time).

In the past two decades electronic assistive technology and telecare have become ubiquitous in local authority adult social care and social work departments (ASCDs) in the UK. In 2019 one estimate suggested 1.7 million telecare users in the UK, and in 2015, the projected size of the market in 2018 was estimated to be £2.9 billion (Socitm 2019).

The rapid rate of technological change, including digitization, increasing use of mobile ‘phone apps, and the emerging application of the ‘internet of things’ (IoT) (The Guardian, 2015) and artificial intelligence (AI) are rapidly changing the technological landscape though they are not yet commonly used by local authorities to support people with care needs. Terminology is also rapidly evolving to keep pace. For example, the NHS long term plan (NHS 2019) refers to ‘digitally enabling technology’. In this paper, however, we use the term ‘AT/telecare’ to refer to electronic devices that either stand alone, or send information outside a person’s home, because emerging technologies such as AI or IoT are not yet widely used in the UK to support people with needs for care and support.

## 2. Why is AT/telecare it at a crossroads?

In the UK, AT/telecare can be purchased via an ASCD Direct Payment (a sum of money given in lieu of care by an ASCD to someone assessed as having care needs), or privately. The availability of and desire for digital technologies seem likely to increasingly blur boundaries between public and private access to technology, as technology becomes more readily available for private purchase, and mobile telephone 'apps' are used to support people with cognitive and physical disabilities. AT/telecare is widely promoted – in Government policy, Local Authority strategies and by telecare companies – as a way in which better outcomes for service users and family carers can be achieved, at lower cost (see, for example. Deloitte 2012, Clarke 2020, LGA 2020, Home Care Insight 2020). Nationally, it remains supported by Government policy and strategy documents. (DH 2005, 2006, 2012; Innovate UK 2015). Locally, it is widely used in local authority adult social care departments throughout England, both to augment but also to replace home care services (Woolham et al., 2018).

However, there is a startling mismatch between national and local policies and evidence that telecare leads to better outcomes for people who use it, and there is some evidence that there is less enthusiasm for AT/telecare among the public than policy-makers as uptake is currently fairly stagnant (Bentley et al. 2018, Deloitte 2017).

Though early, mostly small-scale project evaluations produced positive findings, (Mitchell, 1997, Bjørneby et al., 2009, Marshall et al., 2000, Woolham 2005, Alaszewski and Cappello 2006, Calder, 2006, Bowes and McColgan, 2006, Cahill et al., 2007), each had methodological flaws of some kind and were unable to offer sufficiently robust evidential support for government policy. Possibly in recognition of this, the then government commissioned a very large study to investigate the impact and cost-effectiveness of AT/telecare and telehealth in England, which became known as the 'Whole System Demonstrator' project (WSD) (DH 2012). This trial concluded that telecare made little difference to outcomes of people who used it, compared to a control group who received 'traditional' forms of care or support. (Steventon, et al., 2013). A second trial, specifically focusing on people with dementia (thought to be a group of people likely to derive particular benefit from telecare) was completed more recently. This study, known as the ATTILA trial (Assistive Technology and Telecare to maintain Independent Living At home for people with dementia) also concluded that technology did not delay moves into residential care, (Howard et al., 2020) and did not relieve family 'carer burden' (Davies et al., 2020).

Neither of these pragmatic but well-designed trials seem to have led to any review or reconsideration of the stated value of AT/telecare in local or national policy, or reconsideration of levels of investment in AT/telecare by local authorities. Though findings from the ATTILA trial are very recent, those from the older WSD appear to have been almost entirely overlooked, even by many of those organisations responsible for offering guidance to local authority adult social care managers and practitioners. Recent research has revealed a wide discrepancy between perceived and actual findings of the WSD among many local authority telecare managers (Woolham et al., 2019a). This lack of attention may be considered even more surprising as local government investment in AT/telecare has been significant (Sourcingfocus, 2014, Macbeath, 2013, Smith and Tomlinson, 2013, Tunstall Healthcare Ltd., 2009) when seen against a context of English government local authority 'austerity' policies and substantial reductions in government funding for adult social care (Innes and Tetlow, 2015).

However, despite the lack of fit between evidence and policy, neither the WSD nor the ATTILA trial were able to fully explain their findings. Two possible hypotheses may therefore be offered. The first

is that AT/telecare per se is in some way incapable of fulfilling the multiple aspirations of policymakers and local authority managers of variously promoting independence, enabling people to live in their own homes for longer, supporting carers, reducing demand for NHS services and saving money by reducing health and social care costs. This seems implausible, not least because evidence from early studies referred to above suggested that many individual AT/telecare recipients derived benefits from using it. The second hypothesis is that the locus of the problem is not the technology as such, but the way it is deployed. There is growing research evidence to suggest that the way it is used in England and other parts of the UK does not optimise outcomes for recipients (Wey, 2004, 2006; Wherton and Monk, 2008; Greenhalgh, et al., 2013, 2015, 2016; Sugarhood, et al., 2014; Milligan et al., 2011, Gibson et al., 2015, 2016, 2019, Woolham et al, 2018, 2019b, Forsyth et al., 2020); that it is often seen simplistically as a 'plug and play' service rather than a complex intervention (Greenhalgh, et al., 2013, 2015, 2016; Sugarhood, et al., 2014), that ethical issues attendant on its use are frequently overlooked (Ganyo, 2014), and that it is frequently abandoned by users, with abandonment rates for ATs of up to 78% (Federici, et al., 2016; Petrie et al., 2018).

To confront this problem, and to try to develop a 'researchable question' that might re-set the research agenda for AT/telecare, two of the authors (to be inserted following review) applied for and secured a small 'seedcorn' grant from the Nuffield Foundation. The funds were intended to support involvement of multiple stakeholders in defining the question(s) to be pursued in a subsequent funding application.

### **3. What we set out to do – objectives**

The overall aim of our project was to identify, through a series of focused conversations with an inter-disciplinary group of stakeholders, a 'researchable' question that would form the basis of a subsequent Nuffield Strategic Fund application. To be successful the proposed project would be expected 'to address the most significant themes and developments that will shape the UK public policy agenda and wider society over the next decade and beyond' (Nuffield Foundation, 2019, p. 4). The starting points for these conversations – which we agreed could be reframed by participants - included the following questions:

- What would create optimal conditions for the use of technology enabled care to deliver successful, cost-effective, outcomes?
- What would 'personalised' mean in the context of technology enabled care?
- Given that technology deployment can be via NHS, ASCD or privately, who should pay for what, and how?
- What implications does smart 'phone technology (apps than can potentially replace '1st generation' technology) have?
- Will older people who cannot afford a smart 'phone be left behind?
- Should telecare be used to replace care, or augment it?
- What roles do gender, ethnicity, sociodemographic background etc., play in using ET effectively?

An underlying intention was to identify a feasible research project to provide robust evidence to policy makers, ASCDs and other service providers, researchers, and the public concerning how technology can make social care for older people more cost-effective.

### **4. Methods**

### *Recruitment of key informants.*

We used our knowledge of researchers who had published in areas we felt were relevant to the development of new research questions to identify potential informants. This included academics working in UK settings who were internationally recognised as experts in the field of AT/telecare, or in areas likely to make a valuable contribution to the development of new research questions in this domain. This included people from a range of disciplinary backgrounds including occupational therapy, social policy, economics, gerontology, and psychiatry. A total of 26 people were included in our sample.

### *Identification of themes.*

An online survey using 'Qualtrics' software ([www.qualtrics.com](http://www.qualtrics.com)) was constructed by the authors and sent to each of these individuals. A covering email explained the purpose of the survey and why they had been invited. The survey consisted of 9 open-ended questions:

1. What would create the optimal conditions for the use of AT/telecare to deliver successful, cost-effective outcomes?
2. What does 'personalised' mean in the context of enabling technology, and to what extent is enabling technology 'personalised'?
3. Given that enabling technology can be accessed via the National Health Service, Adult Social Care Departments, or privately, who should pay for what, and how?
4. What implications does smart phone technology (apps that can potentially replace 1<sup>st</sup> generation enabling technology) have?
5. Could enabling technologies reduce or increase inequality (thinking about issues of access, affordability, and digital literacy) and if so, in what ways?
6. Should enabling technology be used to replace care, or augment it, and if so, under what conditions?
7. What roles do gender, ethnicity and socio-demographic backgrounds play in learning about and using enabling technology effectively?
8. What are the most important priorities for research in the field of enabling technology for older people and people with dementia at the present time?
9. Have we missed anything – are there any questions we should have asked, and did not?

Eleven people replied directly to the survey, and one provided a response in a separate email: an overall response rate of 42%. Responses were thematically analysed independently by both authors using 'Framework' analysis (Ritchie and Spencer 1994) before emergent themes were compared and combined.

### *Shortlisting of identified themes.*

The analysis enabled overarching themes to be developed. The authors planned to convene a two day seminar on 26-27<sup>th</sup> March 2020 to which survey participants were invited with a primary goal to 'shortlist' and develop prioritised themes. It was then intended to explore the feasibility of forming at least one group interested in preparing a funding bid to the Nuffield Foundation, using a shortlisted theme as a starting point. Unfortunately, a few days before the seminar was due to be held the authors were forced to postpone the event indefinitely because of the rapidly increasing number of Covid-19 infections as the virus took hold in the UK.

Further work on 'shortlisting' therefore took place online. The original 26 participants were contacted by email a second time with a follow-up Qualtrics survey. This further survey was based on an analysis of responses to the first, from which 10 themes had been identified that might offer

potential to form the basis of a research bid to the Nuffield Foundation. Each of the 10 themes was listed and briefly described. A more complete description of each theme was also attached in the email as a PDF document. Respondents were invited to choose, in order of preference, three themes that they considered most important in relation to Nuffield Foundation application guidance, which stated that applications *'should have the ambition to address the most significant themes and developments that will shape the UK public policy agenda and wider society over the next decade and beyond but will need to be framed as specific questions amenable to rigorous research evidence'* (Nuffield Foundation, 2019, p.4). For each selected theme, participants were also invited to add free text to say why it had been selected. A total of 15 people replied, a response rate of 58%. Responses to this second survey were also analysed using 'Framework' analytic induction methodology, but themes were also ranked: for those themes that were the first choice of participants, a score of 3 was given; for the second choice, 2, and the third 1. This simple weighting was intended to reflect the relative preferences within the choices made.

No ethical review was sought for this study since the surveys were originally intended to contribute to a seminar with a view to constructing a funding proposal. All survey respondents have seen a draft of this paper and are happy for their contributions to be published.

## 5. Findings

### *The 10 identified themes*

From the first survey, 10 themes were identified from responses. These were:

1. *Assessment and matching technology to need.* Respondents expressed concern about the quality and scope of assessments, the skills of assessors and whether the wider organizational context within which enabling technology was deployed promoted best practice assessments to properly match technology to need. Respondents queried the scope of AT/telecare assessments, the skills of assessors and the availability of support and training to this group. Some respondents felt that some assessments were focused on the availability of specific items of technology and the prospective service user's suitability for this rather than starting from a proper understanding of their wishes, needs or goals. It was also questioned whether the 'care management' paradigm used by default to deploy technology were appropriate; arguing that assessments should be seen more as a process than a single event.
2. *Regulatory and legal environments.* This theme referred to the need for a regulatory framework to ensure safety and reliability, while not stifling innovation and investment; the ability of regulatory bodies to keep pace with technological development, or issues relating to lack of device inter-operability. Respondents felt that there was a need for 'kite mark' type standards to ensure safety and reliability, that devices needed to be inter-operable, sharing similar electronic communication protocols, and that the legal environment was not currently keeping up with the rapid pace of technological change; though others were concerned that regulation could stifle research and development of new devices.
3. *Ethical issues.* The degree of alignment between legal and ethical frameworks and the degree to which they are equipped to respond to the implications of emerging technologies for privacy and consent, the challenges of mental capacity assessments and best interest decisions where AT telecare interventions are being considered (for example, among people with dementia, or learning disabilities) and its use to replace, rather than augment hands on care, were raised as concerns.

4. *Digital literacy, digital divides and the future role of smart 'phone technology/the 'internet of things' (IoT)*. This theme concerned the potential of technology to reinforce or mitigate social inequality, a need to better understand which groups of citizens were most vulnerable to exclusion, what its consequences might be for citizenship (for example, access to some services and resources) and well-being (e.g. solitude and loneliness as social interaction is mediated by technology), and what could be done to mitigate this. The relationship between the state and private sector in addressing this digital divide was also raised. Technology's potential role in supporting older people was seen to be under-explored, and one respondent queried whether there was any current empirical evidence of IoT use in care or support settings.
5. *Social policy and telecare*. There was interest in exploring benefits and limitations of prevailing consumerist/choice and control driven approaches to AT/telecare use, whether this could lead to a 'two-tier' market (public vs private) and whether this, in turn might increase or decrease the 'digital divide'. Some respondents also expressed interest in understanding how unwanted effects of the market could be mitigated. There was also some interest expressed in developing and testing alternatives to the current status quo and direction of travel.
6. *Evaluating service delivery models for enabling technology*. Some participants felt there was a need to try to develop typologies of service delivery models for telecare technology, and to better understand which technologies work best for whom, and why.
7. *Signposting and support for non-eligible service users*. This theme concerned questions about what information was shared with people who are ineligible for publicly funded AT/telecare (in England, eligibility criteria restrict public funding according to level of need, and the financial resources of the technology recipient). The need to better understand where this information came from, and who provides this information to people who are not eligible, and whether it is accurate, helpful, and up-to-date; whether private purchasers act on it and what information they find most useful were also raised as potential areas for investigation.
8. *Private sector telecare users*. This theme referred to the need to know more about private purchasers: who they are, whether people who have publicly funded AT/telecare also buy additional devices, what information they have to decide on what to purchase, and levels of satisfaction with any purchases made. This theme was linked to the previous theme about 'signposting' referred to above.
9. *Better utilization of data generated by enabling technology to support investment, commissioning, and practice*. There was interest among some participants in finding out what data are currently collected and used to support investment, commissioning and practice around AT/telecare technology, and what data could be utilized in future. Respondents also felt there was a need to explore the implications of data utilization; particularly machine learning, and the use of computer generated algorithms, to understand potential benefits, to whom these accrue and how these benefits will be realized. There was also interest in exploring the implications of data utilization for consent, privacy and data protection.
10. *Co-production with enabling technology users: understanding relationships between technological development and innovation, and how end users actually use technology*. The final identified theme referred to the prospects of enabling technology being designed to adapt to changing needs, and about what degree of involvement is needed when choosing technology that offers a good fit with identified needs; and whether this can reduce subsequent abandonment.

*Shortlisted themes.* Shortlisting produced clear preferences among participants. Theme 1 of assessment and matching technology to need was the first choice of the greatest number of participants, attracting a score of 19. Theme 3, ethical issues, received a score of 17 and theme 10, co-production of technology with users received a score of 12.

**Table 1. Weighted scores, respondent preferences for themes previously identified below**

Theme	1 <sup>st</sup> choice	2 <sup>nd</sup> choice	3 <sup>rd</sup> choice	Weighted total
1 <i>Assessment and matching technology to need</i>	6	0	1	<b>19</b>
2 <i>Regulatory and legal environments</i>	1	2	1	8
3 <i>Ethical issues</i>	3	2	4	<b>17</b>
4 <i>Digital literacy, digital divides and the future role of smart 'phone technology/the 'internet of things' (IoT).</i>	1	3	1	10
5 <i>Social policy and telecare</i>	0	1	1	3
6 <i>Evaluating service delivery models for enabling technology</i>	1	3	1	11
7 <i>Signposting and support for non-eligible service users</i>	0	0	1	1
8 <i>Private sector telecare users</i>	0	0	0	0
9 <i>Better utilization of data generated by enabling technology to support investment, commissioning, and practice.</i>	2	2	0	7
10 <i>Co-production with enabling technology users: understanding relationships between technological development and innovation, and how end users actually use technology</i>	1	3	3	<b>12</b>
	15	15	14 <sup>1</sup>	

Respondents to this second survey were also asked to justify each of their choices. Several respondents commented that some of the themes were closely linked, but in relation to these top three the following justifications were made.

*Assessment and matching technology to need.*

Assessments that closely matched technology to need were seen by some as an underlying or global theme, without which other themes could not be addressed.

Some respondents felt that this theme was important for reasons of efficiency:

‘Chucking technology at a problem is wasteful so needs better tailoring to avoid problems.’

Professor of Clinical Psychiatry

<sup>1</sup> One respondent expressed only two preferences.

'I just think that without this provision, telecare is going to continue to be ineffective, service-led and disempowering.'

Senior Lecturer, Occupational Therapy

Another respondent went further, suggesting that proper matching of need with technology could produce wider benefits:

'I've seen some pretty awful examples of poor assessments leading to unhappy outcomes including 'digital graveyards' of unused applications. Presumably, too, skilled assessment and matching technology to need could lead directly to being able to look at cost-benefit/economic analysis as well as impact on meeting need. Assessment and matching application to need could also lead to a dialogue between end-users, assessors and designers (of) where there are gaps, refinements, or areas for innovation'.

Research Officer

The difficulties that would need to be overcome to make improvements in the matching of need with technology were also mentioned:

'Evidence suggests that 'standardised' telecare/Assistive technology packages are installed but often discarded or limited in their use, due to the lack of 'fit' between the technology and the needs/wishes of the individual. Information from practitioners indicates a lack of time/resource for a more in-depth assessment, as well as practices/case management structures based upon 'one-off assessments'.

Senior Researcher, Primary Care

The importance of a robust evaluation framework, allowing better evidence of the efficacy of technology against person centred objectives, and acknowledging the complex nature of an AT/telecare intervention was also mentioned by one respondent.

Another felt that there was an underlying need to examine policy frameworks that 'framed' what was actually included in the scope of an assessment process for AT/telecare, and suggested three questions for researchers to answer:

1. How are outcomes for assisted living technologies and their services determined, what informs such determinations (e.g. the policy landscape, clinical/therapeutic/care needs or needs as perceived by end users) and how are these outcomes integrated into assessment processes?
2. What factors influence the proper assessment and matching of technology to user needs within assisted living technology services, what would constitute improvement in the process of assessment/matching and what might be needed to achieve such improvements (e.g. staff training)?
3. How far do assessments and user matching processes meet end-user expectations and needs, and how far can such processes be considered to be 'person centred' – and therefore more able to respond to individual needs (including as individuals needs change; e.g. as a dementia diagnosis progresses'

Senior Lecturer, Dementia Studies

The absence of uniform approaches to assessment activity was also highlighted:



'...there (is) some value in trying to standardize the assessments of need for technology and we really need more research to develop and critically test and appraise better standardised needs assessments'.

Professor of Old Age Psychiatry

Though standardisation is a way in which assessment standards could be improved, the need for more holistic and non-bureaucratic approaches were also mentioned:

At present, assessments of needs (service users and carers) is *the* gateway to assistance from statutory bodies. Assessments are carried out with a wide range of people; not only those who are financially disadvantaged. The introduction of technology into the social care system has been piecemeal and has tended to reinforce an administrative, bureaucratic approach to social care. There is therefore a serious need to investigate ways in which technology could be enabling in more consistent ways...this would require better, more sophisticated technology that takes account of shifts and changes in people's circumstances (which is normal for most). It also requires a good understanding of older people's capabilities vis-a-vis technology and the likelihood of change over time as more tech-savvy cohorts age. Another important aspect of this theme is the likely growing use of self-assessment and ways on which older people could be educated in using technology to present their needs and strengths'

Professor of Social Gerontology

As well as more sophisticated, mutable technologies available to improve their ability to meet needs, one respondent also drew attention to the need to reform the way technology is delivered, and that in addition to having more time and resources (referred to above by another respondent) the need to improve the skills of assessors was also suggested:

'Given the technological changes service frameworks are destined to change (and elements of that change are increasingly in place). And, even if they weren't destined to change, we have a moral duty to press for such changes in order for service frameworks, (and the technologies) to be (re)shaped in ways that are more responsive to people's needs and choices...the social care workforce needs to gear up to become more knowledgeable, more digitally literate and more forward thinking in order to argue its place in the context of people's wider health and well-being'.

Senior Lecturer in Information Systems

### *Ethical issues*

Ethical issues were selected as the second most important theme for research investigation in the field of AT/telecare, and respondents felt this was justified because current and emerging technologies posed significant ethical and moral challenges. One respondent considered this was also an underlying, global theme:

'This is an overarching issue that should inform how technology develops, is utilized and offers both protection and enhances care. In essence, this needs 'sorting' first or at least very early in any programme's development because it has a number of dimensions and tentacles that penetrate the other themes. It is not easy to research these issues but I think the following questions would be worth thinking about:

How do different stakeholders – users, families, providers, commissioners – frame and understand ethical considerations re. enabling technology in care? What informs these considerations and why? What might be the issues that create (cause?) profound ethical challenges? (One could present a range of scenarios including care robots ‘witnessing’ abuse, hearing an older person talking about suicide, stopping a technological intervention the same day the person fails to pay for it, leaving them bed-bound, and so on.’

Professor of Social Policy

Some respondents felt there was a need to obtain a better understanding of what was acceptable to the public in respect of access to and use of personal data (now even more prominent in the Covid pandemic). There were also calls for a review of current ethical frameworks associated with technology:

‘I believe that the certain growth in digital technology should be accompanied by an effective examination of ethical concerns. I am concerned that technology will continue to develop at pace – because it can – without a comprehensive and ongoing enquiry into ethical matters. This is likely to become an even greater concern with the potential development of technology in ‘tracking’ vulnerable people in respect of Covid-19 and other digital applications in this fast growing field’

Professor of Social Care and Health Integration

There was particular concern about the implications of ‘machine learning’ and that public understanding of data generation and management was insufficient to ensure that consent to collect and use personal data was fully informed. A need to balance out potential benefits with disadvantages, and a better understanding of who might benefit most were also noted.

One respondent described a need for a different ethical framework (in place of the prevailing ‘Principlist’ approaches):

‘A clear but flexible ethical framework is essential, particularly moving away from principles based generalised ethics to an ethical framework more based around capabilities and ethics of care.’

Senior Lecturer in Occupational Therapy

It was also considered important that ethical decisions about technology involve not only end users but also family and paid care workers, and some respondent felt there were obvious links between the need for a better understanding of ethical issues and the ‘regulatory framework’ theme described earlier.

### *Co-production*

The third most popular theme amongst respondents was co-production, and several aligned this style of working with assessing needs and matching those identified needs with technology. In relation to AT/telecare, co-production involves the active participation of service users in defining remit, scope and delivery of AT, and can involve the contributions of service users to both the design and development of technologies, and to the organisation and delivery of services providing them. Some saw co-production as a way of achieving a more precise understanding of the needs and aspirations of end users, and others suggested that decisions about what needs could be met through technology could be a very effective way of minimising technology abandonment. One respondent saw this as aligned with English social care policy imperatives of personalisation and its

mantra of 'choice and control'. Age related differences in attitudes to technology were also seen as fruitful areas for research:

'When people (of any age) have agency in the formulation, design and implementation of services...the hypothesis asserts that there will be greater enthusiasm and uptake for it....there are several examples of enabling technologies developed for older adults by younger people who are deeply immersed in technological sciences. By and large these technologies are not deemed useable or acceptable to older audiences. Therefore to understand the digital needs of older people, it is crucial to understand and analyse their relationship with technologies'

Research Officer

Responses to this theme also embraced the importance of human/user-centred design, and acknowledged that service providers and practitioners are also users of emerging technologies, and that increasing use will inevitably be made of digitally enabled services.

## 6. Strengths and limitations

This paper reports only on the perspectives of academics working in UK universities and colleges and is likely to be limited by the lack of input from technology end users, family (near or distant) or paid care workers, or front-line professionals. Incorporating perspectives from these groups may assist in thinking more clearly about efforts for inclusion to address socio-economic and other inequalities. The seminar to discuss the findings may have added to debate and shaped ideas further, for example, by thinking more of theoretical perspectives. The paper is also limited to the UK, and a predominantly English, context, and represents a 'snap-shot' of opinion and perspectives. These shortcomings are clearly likely to affect the generalisability of the findings reported here.

However, the paper also has some significant strengths. Participants were each internationally respected academics and researchers, with a deep understanding of the topic. They were also diverse, with a wide range of disciplinary backgrounds represented. The study also asked participants to consider new research questions for AT/telecare to try to address the gap between current policy and research evidence; thereby encouraging a shift of focus away from current practice (arguably shaped by extensive vendor marketing and an imperfect understanding of current research evidence).

## 7. Conclusion

### *What the findings tell us*

The findings presented in this paper confirm perspectives emerging from research evidence that AT/telecare will continue to perform sub-optimally unless changes are made to the way it is used. Respondents identified multiple themes for future researchers working in this field, including

- How AT/telecare can be more closely matched to the needs, goals and aspirations of users;
- How to improve the 'skill-set' of assessors, and the most effective means of doing this through training and support;
- How to overcome challenges facing AT/telecare services if they were to operate with a view of assessment as a long term process rather than the current standard of 'single event' assessment protocols;

- How to develop incentives and mechanisms to encourage manufacturers to develop AT/telecare devices and systems that are fully inter-operable, and designed with the participation of end users, families, and carers to operate flexibly, so they can be readily adapted to the changing needs of recipients;
- The importance of research to better understand the ways different AT/telecare stakeholders perceive ethical issues and concerns, and what is needed, now and in future, to mitigate risk, prevent technological abuse, and identify and resolve abuse if it is found.

### *Implications*

Contributors to our surveys confirmed that AT/telecare is at a 'crossroads' where changes to service infrastructure and professional practice are needed to enable ASCDs to use it optimally and to embrace and adapt to rapid technological change. The current coronavirus pandemic, which was at a very early stage in the UK at the time we collected our data, also forces greater attention to be paid to the role of AT/telecare (and technology more generally) and its place in social distancing measures and infection control; although at the present time, without clear guidance on how it could be used most effectively. Simultaneously, the spiralling costs of the pandemic are likely to mean even more reductions in public spending as the economy shrinks dramatically. The current health, welfare and economic context means that now, more than ever, a clearer idea of how to use AT/technology to move forward is needed. New research, engaging with the issues that have emerged from our work, offers the prospect of new insights that could guide future policy in this arena. In this respect, we are currently working to use these insights as a frame of reference for a new study to explore how the priorities highlighted in this paper can be embedded into practice settings and everyday support and care. One particular avenue warranting further exploration relates to how AT/telecare can be provided in more person-centred ways, which combine current approaches to personalisation of care services with an appreciation of how successful examples of personalised AT/telecare arrangements are co-produced in partnership between services, technologies, end users and their families (Greenhalgh et al., 2016; Gibson et al., 2019). Such arrangements are inherently flexible and individual, based on the specific circumstances and living contexts of end users.

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