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Harnessing technology to meet increasing care needs

The increase in average life expectancy in the UK during the 20th Century, rising from 50 to 78 years, ranks as one of society's greatest achievements.[1] A third of people born in the UK this year can expect to live to 100.[2] However, as set out in the Foresight report from the Government Office for Science entitled Future of an Ageing Population, the population ageing that comes from longer lives presents challenges and opportunities for individuals and for the economy.[3] For example, the associated increased demand for public services will challenge the sustainability of public finances.

The UK will need to adapt to this shift in many ways. The sensitive application of technology will be very important. We have considered how technology could help address the specific challenges affecting care and support. Whilst technologies can never replace human interaction, they can play a significant role.

Many more people will need social care in the future. The number of older people having problems with at least one activity involved in daily living, such as eating or bathing, is projected to grow from 2.9m in 2015 to 4.8m in 2035.[4] This implies 1.3m more people receiving care from friends or family, nearly 300,000 more users of state funded care, and £10.6bn extra public expenditure on social care.[i]

Public spending on adult social care for the over 65s in England was approximately £7bn in 2015/16.[5] Delaying or avoiding transitions into more acute, more expensive services can save individuals and Government money. The NAO estimates that the NHS spends £820m a year on older people in hospital who no longer need acute care, but whose discharge has been delayed.[6]

However, recruiting the care workers of the future may be a challenge. The ONS estimate that in 2034 there will be 344 people of pensionable age for every thousand of working age, rising from 310 in 2014.[7] This may make it harder to recruit the paid carers needed to meet the growing demand for care. These projections are sensitive to long term assumptions about net migration. As inward migrants are generally young, lower net migration means an older population.

Relying on unpaid family or friends to meet increased demand for care has an impact on productivity across the economy. Caring is a major reason for early withdrawal from work- accounting for 16% of economic inactivity amongst people between 50 and State Pension Age.[8] Providing significant amounts of care for a family member can also be bad for the carer's health.[9] Poor health is another major reason to leave work. A significant increase in unpaid carers may exacerbate the impact of population ageing on the labour market. Trends in family make up- including rising childlessness and divorce - also reduce numbers of potential family carers.

[i] This assumes disability rates remain constant and current patterns of care are maintained. However, recent trends suggest that the prevalence of disability in older groups may be increasing.

The care sector currently runs on a low wage, staff-intensive model, and struggles with retention. Use of technology is limited at present. Together with the challenges described above, this creates an imperative to find new ways to support older people to maintain their independence, and to deliver care for those that need it in a way which makes best use of the available carers.

Any new solutions developed for the UK system will find a ready global market. This challenge is not unique to the UK. Demand for long-term care, and wider age-related services such as appropriate housing or leisure services, will rise around the world. For example, the market for personal care robots in Japan, which stands at $155m, is predicted to grow to $3.7bn by 2035.[10] New technologies and innovations in service delivery could transform how we deliver care, greatly help care providers and support independence in later life. Innovation can help by:

- Supporting people to maintain independence in daily tasks, such as cleaning and using the toilet. Technologies could include robots which take on household chores or wash and dry toilets. These technologies can enhance dignity and free up carers' time for higher value care, which should help make care roles more attractive.
- Connecting people with limited mobility to their friends and loved ones, combatting loneliness. Technologies could include social media or new forms of mobility, such as driverless vehicles.
- Supporting family carers to perform their role, even if they live elsewhere, and combine their caring responsibilities with staying in work. Technologies could include online platforms to coordinate care ore-care records shared between families and service providers.
- Supporting care providers to deliver more efficient, better care. Technologies could include automated logistics to better plan rosters for food and drug delivery, e-care records and automated medicine dispensing. There is also a role for better use of generic business administration tools.
- Providing accurate, up to date data to: inform care planning; identify and manage risks early; summon support in a crisis; and provide reassurance to users, their families and care providers. Technologies could include sensors which call for help if someone falls, sensors that predict likelihood of a fall, or devices which identify early signs of infection.

The need for a systemic approach: recommendations

We convened a series of expert workshops to explore these issues. An important outcome was the clear consensus that provision of care is a complex interlocking "system of systems". No single action, in isolation, will ensure the UK can make the most of technology to deliver care. There are a series of issues that need to be tackled. Awareness of technology is low amongst older people and care providers. Low margins mean little incentive for providers to invest in technology. Low pay gives little incentive for care workers to invest in skills. Major retailers rarely stock existing solutions. Where these exist, technical function often predominates over aesthetics or ease of use.

There is no real shortage of new assistive technologies, nor of innovative approaches to using technology to deliver better care. However, these often fail to scale up, limiting their national impact and preventing the growth of innovative businesses. Successful innovations in care provision are not just about developing the right device. They often require multiple parts of a care system, from care providers and commissioners to GPs or hospital discharge officers, to work together and adapt how they provide their services.

The full potential of technology in care can be realised only if we act on this system as a whole. The Government's Industrial Strategy and forthcoming consultation on reforming care and support offer a rare opportunity for such an approach. We offer the following recommendations with this opportunity in mind.

Recommendation 1: We recommend that UKRI develop a Healthy Ageing challenge within the Industrial Strategy Challenge Fund. This should invite bids to demonstrate new, place-based applications of technology to support independence or delivering care, with a focus on ensuring scalability.

Challenge Fund bids should demonstrate that they can bring the right partners together to deliver new innovations that will scale quickly, including major retailers or local authority commissioners for instance. Innovations that support care and independence in later life are likely to have the biggest impact in the short term. However, longer term interventions through the life course to extend healthy life expectancies and delay the onset of needing care will also have a significant role to play. This might be a useful second phase for the Challenge.

Tight budgets in social care can mean that assistive technologies currently on the market prioritise functionality over desirability. This is a barrier to their uptake. However, well designed, desirable technologies can find a market amongst older users - tablet computers have seen a rapid uptake in the over 60s group.[11] Many mainstream consumer technologies, from sharing economy platforms to the growing number of smart home platforms, could support independence in later life. However, their potential will only be realised if they are accessible for older users.

Although the UK has world-leading design institutions, very few leading university design courses focus on older people as a significant user group. An institution that brings together technology and design organisations could develop and demonstrate best practice in age-friendly design. This should also support place-based innovations in care.

Recommendation 2: We recommend the establishment of a National Centre of Excellence in Ageing and Design, bringing together academia and industry to embed inclusive, age-friendly design in the development of mainstream technology. The application of social and behavioural sciences to understanding people's interaction with technology will be an important element of this.

Ensuring the growing numbers of older people in the UK have appropriate housing will be important to maintaining their health. However, dealing with the consequences of hazards in older people's homes, including falls and ill heath related to cold houses, currently costs the NHS about £624m per year.[12]

Government has committed to producing guidance to Local Authorities on planning for their older populations through the Neighbourhood Planning Bill. This should take account of local projections of population ageing. However, over the medium term, most people will live in houses that are already built. As such, the development of technologies that support people to remain healthy and independent in the UK's existing housing will be critical.

A lack of trusted advice and guidance is one of the major barriers supressing demand for assisted living technologies. Commissioners and care providers struggle to know, from the many available technologies, which will have the biggest impact on costs or wellbeing. For citizens, Government already supports people with housing adaptations through the Disabled Facilities Grant. However, this is only available to people with less than £6,000 in assets, who meet the means test. This creates a potential 'cliff-edge', where people who do not meet the means test may not receive any advice on what they can install themselves.

Recommendation 3: We recommend that Government review the support provided to citizens and care providers who are looking for assisted living products. This should include how to better curate evidence on what works and ensure those who do not meet the means test are able to access consistent and good quality advice. The ambition should be to ensure that everyone is able to purchase assistive products with confidence.

If the UK sees a rapid growth in the use of smart home technology, wearables and wider sensors in the delivery of social care, this will lead to large amounts of new, care-relevant data. This could be used to better target care services more effectively, understand demand for care and inform clinical decision making. Better interoperability between autonomous vehicles and public transport could allow for more seamless door to door travel, promoting independence.

However, much of these data currently sit within the private systems of care or technology providers coded in a way which cannot work across platforms. If this remains true, it will prevent the full realisation of this potential. Furthermore, we know that privacy fears are a barrier to uptake of some technologies.[13]

Establishing standards and APIs (application programme interfaces) for these data could help ensure they can be shared and used across service providers, maximising public benefit and better commanding public confidence. With other countries facing the same issue, there is also an opportunity to create economic value for the UK by moving quickly in this area.

Recommendation 4: We recommend that the Government encourage industry to develop data standards and APIs that allow care providers to use and share the data generated by smart home and assisted living devices. This process should also involve NHS providers so that care data can be better fed into clinical decision making, and vice versa.

The recommendations in this letter are specifically relevant to the government's current work on the Industrial Strategy and Social Care Reform. A number of other issues were raised with us. A particular issue is developing technology skills and engagement amongst older people and the social care workforce. There is a significant opportunity if we can work out how to encourage people to share their data for the national good. There is also a need for greater clarity around who is liable in the event of service or device failure, and dealing with consent for people with declining cognitive capacity. We intend to pursue these issues further, and will continue to share relevant findings with the Cabinet Office team working on social care reform.

Work on this topic has been led by CST members Dervilla Mitchell (Arup) and Professor Sarah Harper (formerly a member, Director of the Oxford Institute of Population Ageing), together with Mike Lynch (Founder of Invoke Capital).

We are copying this letter to the First Secretary of State, the Chancellor of the Exchequer, the Secretary of State for Business, Energy & Industrial Strategy, the Secretary of State at the Department for Health, the Secretary of State for Work and Pensions, the Minister of State for Universities, Science, Research & Innovation, the Cabinet Secretary, and the Permanent Secretaries at HMT, BEIS, DH and DWP. The Council for Science and Technology is grateful to all those who participated in the expert workshops we held to inform this work.

Professor Dame Nancy Rothwell
Co-Chair

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