

Healthcare technology:

A need for accessibility





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Introduction

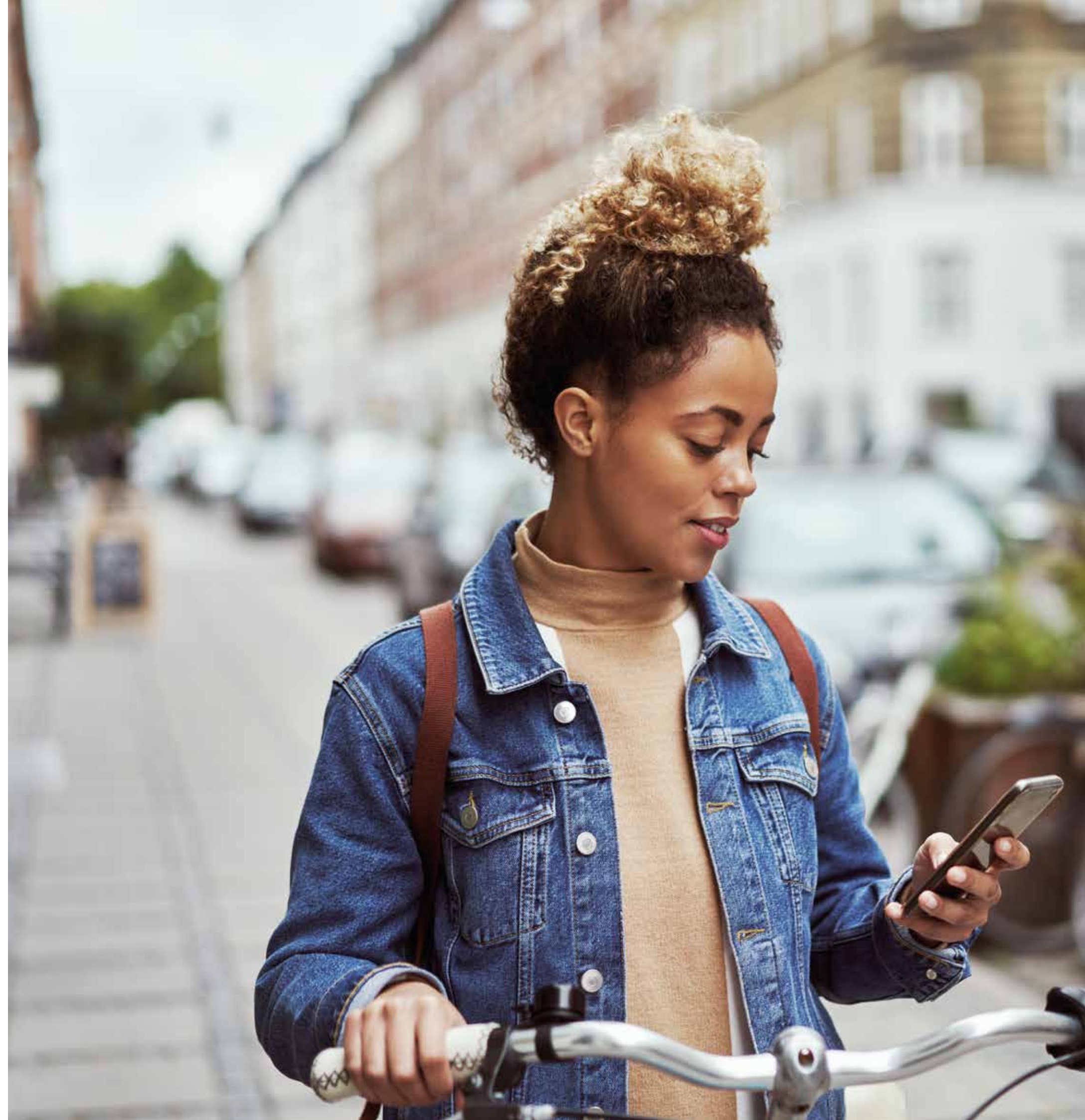


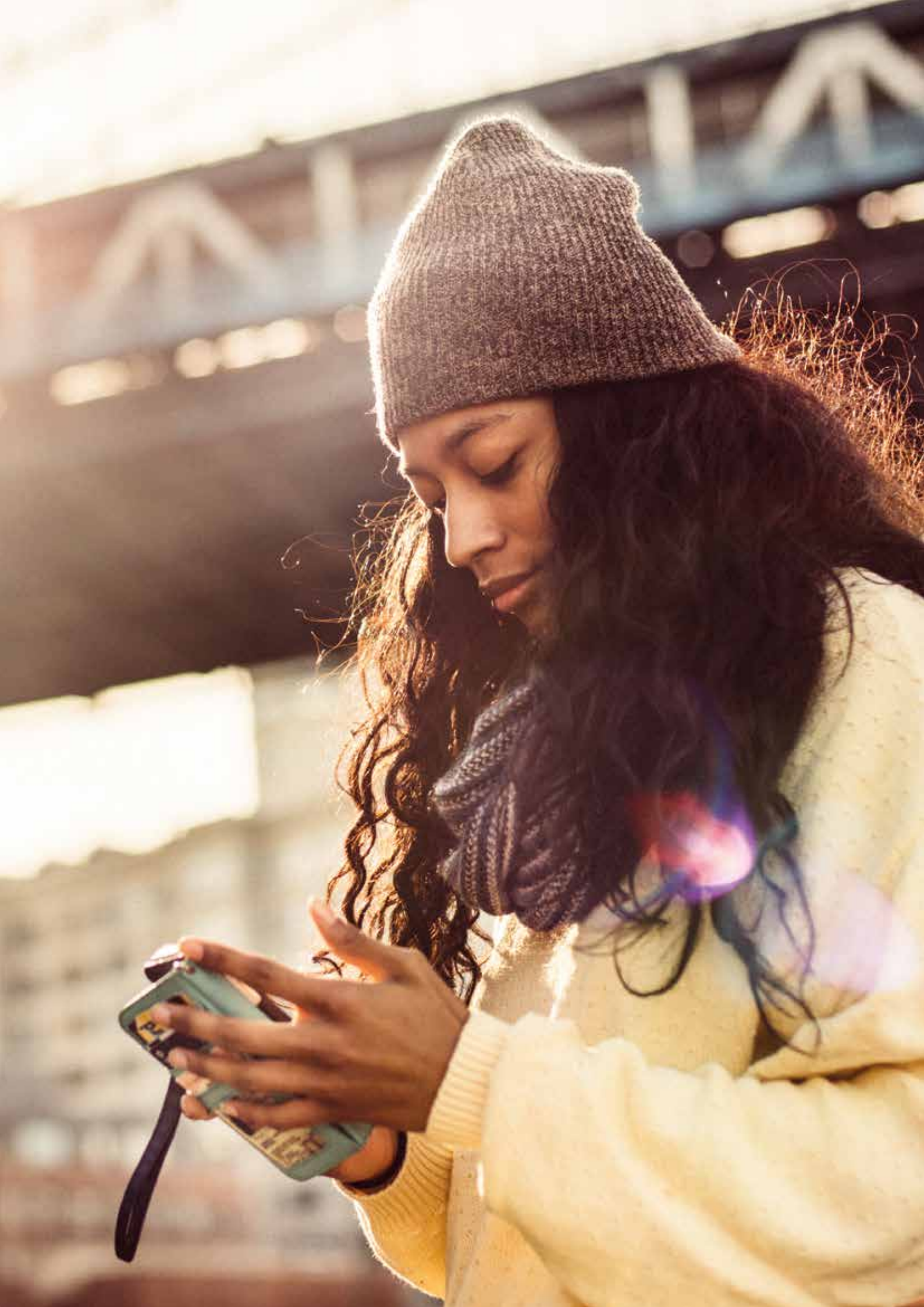
When equipped with a smartphone and the right app, patients can consult a clinician and manage aspects of their own health with the swipe of a finger.

We're living in an era where technology facilitates instant access and effortless user experience across a plethora of industries. Digital disruption has led customers to expect a new standard of consumer experience, pioneered by 'sharing economy' organisations such as Airbnb®, and other seamless, readily accessible tailored services. People have become accustomed to a world where they can stream music on Spotify® by asking Alexa®, call an Uber® with one tap of their phone, and take their pick of the hundreds of instantly available shows on Netflix®. These raised expectations are leading people to seek out better digital experiences from other, more traditional sectors, including healthcare.

In an industry with a seemingly endless list of possible uses for technology, the term digital health or health technology, can sometimes prove difficult to define. The phrase encompasses everything from databases and electronic health records, to mobile applications and wearables, and with today's ever-advancing technology these offerings are continuously evolving.¹ One form of healthcare technology, the use of mobile devices for healthcare purposes (also known as mHealth²) has become more widespread over the past few years with the proliferation of smartphones. This area now dominates the digital health market, with more than 200 health apps added daily to app stores worldwide.³

Such apps can help to bridge gaps in care to benefit not only the individual, but healthcare as an industry. When equipped with a smartphone and the right app, patients can consult a clinician and manage aspects of their own health with the swipe of a finger. This has the dual benefits of engaging patients in their own care while potentially saving healthcare professionals valuable face-to-face interaction time. Placing individuals at the heart of care may help improve health-related behaviours and potentially lead to better clinical outcomes.⁴ There is however, still work to be done. For this style of care to become routine practice, we first need patients to be able to easily access, understand, and utilise the relevant technology and data.





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Barriers to accessing health tech go beyond disabilities

When hearing the term 'accessibility', we may initially think of those with physical or mental disabilities and the disadvantages they may face when interacting with products, devices or services. Although this is one accepted definition of the term, it is also one of vast simplification; there are a host of accessibility challenges beyond physical or learning impairments.

Cost and reimbursement as barriers to access

One barrier to access may be as simple as being able to afford or obtain new technologies. Individuals from low socioeconomic backgrounds may struggle with accessibility issues which can be further exacerbated by an inability to effectively utilise the technology due to existing disadvantages, such as low levels of reading and writing literacy.⁵ One of the most blatant examples of this can be seen in the US healthcare system within state Medicaid programs, where US patients who experience socioeconomic hardship may often fall through the cracks of health technology innovation. While most people own a smartphone, not all have an up-to-date device with the software required to run many mHealth apps. In addition, Medicaid reimbursement models may not completely cover the latest digital innovations, forcing patients to go without or choose between medications and technologies to avoid overwhelming excess costs.⁶

There are also socioeconomic disparities in digital health access within Europe; a 2015 German study reported that people who are considered to be 'upper' class were 4 times more likely to seek health information on the internet than those who are considered to be 'lower' class. This discrepancy is not limited to

explicit socioeconomic classes, it was also reported that those who had migrated to Germany were 44% less likely to use the internet to find health information than those born in the country.⁷

And when it comes to digital health, equal opportunity of access does not ensure equal use. It has been reported that as education level increases, so does the likelihood of an individual using the internet for health-related reasons.⁸ Furthermore, within those who do use the internet to find health information, there exist differences in search techniques between education levels. For example, when seeking a 'second opinion' those with a lower education were more likely to search for means of emotional support than those with a higher level of education, who were more likely to search for specific information regarding disease and/or treatment.⁸ Also, those with lower levels of education were most likely to report being unsatisfied with the information found due to it being too difficult to understand or lacking visual illustrations; this highlights a perhaps unthought of issue that for healthcare information to be truly accessible, it needs to be able to be understood by all. Therefore, even with sufficient access to the necessary digital health services, those lacking a higher level of education may be at a disadvantage when using health technology to inform care.

Age and healthcare technology uptake



77%
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technology.¹¹

One factor that is often mentioned in the context of healthcare technology uptake and usability is age and generational differences in technology use. While seniors are no longer isolated by their lack of digital usage, a disconnect between older and younger technology users is still present. Perceived vulnerability, severity and ease of use are deemed more crucial factors for middle-aged and older users in terms of mobile health services in comparison with younger users.⁹ For instance, elderly individuals may be deterred from using patient portals if a required password has been lost or forgotten after initial registration.¹⁰

Seemingly, a lack of interest in health technology is not the problem with regards to the challenge of accessibility within older age groups. An Austrian survey reported that 77% of over 50's exhibited a positive attitude towards at least one new 'health and support' technology,¹¹ Additionally, in the UK it has been reported that awareness of online health services is highest in the 65-74 age group.¹²

Perhaps unsurprisingly, the main problem that the older generation face when using technology to assist them in their health is the complexity of the technology itself.¹³ An increase in sophistication of technology-based healthcare will almost certainly come with an increase in complexity which may make it difficult for those who are not familiar with modern technology to adapt to. A report on the barriers and enablers for the acceptance of new technologies stated that even those who could adapt to using new technology when it was functioning properly would struggle when issues with the technologies arose.¹³

"The vast majority of people have a lot of trouble getting into their personal health records and once they do get in, it is completely unsatisfying." – *Leah Sparks, CEO & Founder of Wildflower health*

Digital disparities also exist within the senior age category itself. When looking at internet usage among elders (aged 65 or older) across European countries, only 2.5% of elders in cyprus, and 4.3% of elders in Ireland, use the internet for health-related purposes. In contrast, Finland and Estonia report almost 44% of their elderly population using internet-based health care services.¹⁴

The accessibility and adoption of health technologies is influenced by a number of personal, and sometimes opposing, factors. Yet the presence of these barriers does not equate to a lack of desire to learn the skills required to utilise the technology. By focusing efforts on these vulnerable populations; developing the necessary tools to improve their accessibility and confidence in using various digital health services, both pharma and technology companies can seize an opportunity which could ultimately lead to a better quality of life for these individuals.

"How do you prefer to communicate?
What images do you resonate with?
Do you prefer short or in-depth articles?
Healthcare technology Personalisation
is as much to do with personalities and
types of learning, as it is demographic
and income. The vast majority of
people have a lot of trouble getting
into their personal health records and
once they do get in, it is completely
unsatisfying." – *Leah Sparks, CEO
& Founder of Wildflower health*



Differing expectations of health tech and data



A British survey reported that 1/3 of those over 55s used some form of health technology, compared to just 12% of those aged between 35-44.¹⁷

There is no denying that millennials are a driving force for change across a range of industries and healthcare technology is no exception. Although the digital divide between generations is gradually closing, it is evident that beliefs about digital health still vary. A 2014 survey reported that the age groups 15–24, 25–39, and 40–54 agree that the internet is a good tool to help improve their knowledge of health-related topics (86%, 85%, and 82%, respectively). In contrast, only 63% of those older than 55 agreed with this statement.⁸ mHealth is already a huge trend within the younger generation: a significant two-thirds of 14–22 year olds report that they have used an mHealth app, while 28% of 18–22 year olds say they have connected with health providers online using tools such as online messaging, apps, texting and video chat.¹⁵

Younger generations are looking for ways in which healthcare technology can be utilised to improve their care. A recent survey reported that millennials and Gen-Zs are more open to try and trust alternative avenues of healthcare info and are not completely reliant on doctors and medical specialists.¹⁶ Moreover, millennials are more willing to include pharmaceutical products in their lifestyles,¹⁶ in order to live a healthier life, rather than just using them when they are feeling unwell. This is reflected in the literacy survey, which reported those in the 15-24 age group being the most likely to use the internet to research mental wellbeing and lifestyle choices.⁸

"Social media knows what you like and presents to you exactly what you want to see. In healthcare, in part because of privacy challenges, it's harder to do that but consumer expectations have changed due to the rest of the technology market. In healthcare, you're still sifting through a bunch of stuff that's not important to you before you get to what you want." – Leah Sparks, CEO & Founder of Wildflower health

But as mentioned previously, it's not just younger generations who are looking to technology to facilitate a more active role in their care. In 2015, a British survey reported that 1/3 of those over 55 used some form of health technology, compared to just 12% of those aged between 35-44. The survey also reported that over half of the elderly British population would be interested in using various types of healthcare technology to help them in their everyday life, such as fall detectors and stairlifts.¹⁷

Other forms of digital health services such as remote diagnosis or teleconferencing with their physician, are yet to be more widely welcomed by some seniors, despite the potential to reduce waiting times and improve access to consultations. Some are reluctant to tackle the learning curve that accompanies new technology, a factor which can be aggravated by any physical difficulties they face, such as mobility impairment. With teleconferencing systems, both vision- and hearing-related issues can introduce difficulties, which can deter some seniors from using the technology altogether.¹⁸

It seems there is a contradiction within older generations: many seniors claim they do not believe telemedicine is important to their healthcare, yet they simultaneously desire a variety of different digital health services to improve their care delivery. Is there confusion over the definition of the term 'telemedicine', or are current healthcare technology options not intuitive enough for them to believe in its potential?



Applying effective accessibility guidelines to health technology



For each condition the user experience varies significantly, and different accommodations are needed, so accessibility preferences may be ideal for one user, but not for another.¹⁹

Current guidelines regarding accessibility primarily focus on the traditional definition of the term and relate to those living with disabilities. Yet for these individuals, levels of competency can differ greatly, even between similar conditions. For instance, relatively few of those with visual impairments are completely blind, nor is acquired blindness identical to blindness from birth. For each condition the user experience varies significantly, and different accommodations are needed, so accessibility preferences may be ideal for one user, but not for another.¹⁹

Across Europe, governments are introducing requirements that uphold companies to certain standards of general accessibility, such as the UK's Equality Act 2010.²⁰

Consequently, there are an increasing number of guidelines that companies must adhere to in terms of design. For digital health in particular, guidelines such as the UK's National Institute for Health and Care Excellence (NICE) 'Evidence Standards Framework for Digital Health Technologies' provides a set of standards for all forms of healthcare technology, regardless of platform.²¹ These guidelines were introduced in response to results from a number of prominent surveys, including the statement that 82% of Generation Z wished to see more digital solutions from the National Health Service (NHS). Their aim is to help developers and investors to understand the level of evidence their new technology must demonstrate to qualify for use within the UK's NHS.²²

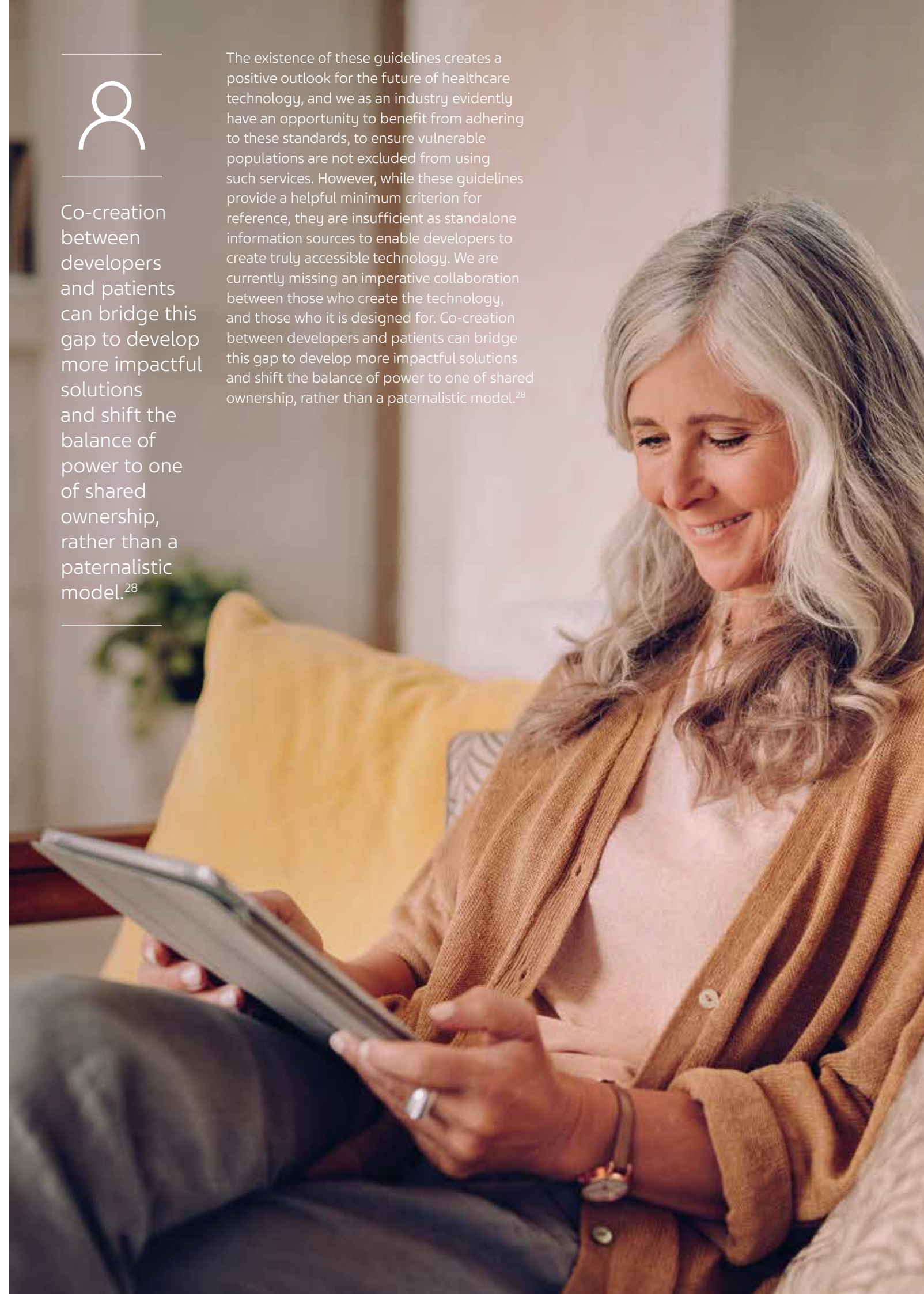
A leading producer of guidelines is The Web Accessibility Initiative (WAI), an international organisation that creates Web Content Accessibility Guidelines (WCAG) to aid developers in producing websites and content that are more accessible for those who may struggle to interact with them.²³ However, despite producing what is widely accepted as the definitive guidelines to produce accessible websites, the WAI have faced criticism in their approach. Some believe they fail to put the user at the heart of the content creation process,²⁴ while others claim their success criteria requirements for making content understandable largely ignore the needs of people with learning difficulties and cognitive limitations.²⁵

Regarding the development of medical devices and software, accessibility guidelines recommend providing at least one feature that is tailored for those with colour blindness, visual or hearing impairments, and motor or tactile impairments. For instance, a device would need methods of retrieving information that do not require vision, such as offering audio repeats and descriptions of content.²⁶ In terms of mHealth apps, collaborative organisation Xcertia provides guidelines to increase clinicians' confidence in these apps, with the aim of improving patient outcomes.²⁷ Yet, these guidelines lack any reference to accessibility requirements to improve user experience, for example recommending the use of a secure password for mHealth systems, despite our knowledge that requiring a passcode can deter elderly patients or those with memory or cognitive difficulties.¹⁰



Co-creation between developers and patients can bridge this gap to develop more impactful solutions and shift the balance of power to one of shared ownership, rather than a paternalistic model.²⁸

The existence of these guidelines creates a positive outlook for the future of healthcare technology, and we as an industry evidently have an opportunity to benefit from adhering to these standards, to ensure vulnerable populations are not excluded from using such services. However, while these guidelines provide a helpful minimum criterion for reference, they are insufficient as standalone information sources to enable developers to create truly accessible technology. We are currently missing an imperative collaboration between those who create the technology, and those who it is designed for. Co-creation between developers and patients can bridge this gap to develop more impactful solutions and shift the balance of power to one of shared ownership, rather than a paternalistic model.²⁸



Beyond the barriers; what is already being done?



Over 220,000 people improved their digital health literacy, including seniors, those of a low socioeconomic status, with disabilities, unemployed, with poor mental health, or from BAME communities.³²

Across the healthcare and technology industries, it is a popular belief that digital health services require sophisticated technologies to be effective and successful. Yet, there is evidence of impactful healthcare technologies that function through basic features such as text messaging. The ever-ubiquitous ownership of mobile phones and the subsequent proliferation of mHealth apps has led to a surge in these text messaging interventions (TMIs). In the self-management of diabetes, quitting of smoking, promoting of weight loss and exercise, and adherence to medication, TMIs have shown great promise in improving outcomes. Such simplistic strategies have the potential to conquer accessibility challenges and require minimal effort and digital capabilities from the user. Importantly, the duration of these studies to date has largely not exceeded 12 months. More work is therefore needed to assess the impact of TMIs over the long-term. That being said, should the long-term results prove to be as promising, what's stopping this long-established, basic technology from being capitalised on to create simple, cost-effective interventions that are much more accessible.²⁹

The IC-Health project is an ongoing development of a collection of Massive Open Online Courses (MOOCS), which aim to improve European citizens' digital health literacy. The initiative includes participants across an assortment of social and cultural backgrounds, with differing levels of digital health literacy. While the program is incomplete, the results and insights it generates will be used to formulate proposals for larger scale action, using participants to form Communities of Practice to inform the development of future MOOCS' structure and content. This model demonstrates a clear example of the critical co-creation process previously mentioned. Collaborating with the end user in the initial stages of development enables companies to use their valuable insights to inform the content ultimately designed to improve their quality of life.³⁰

Recognised as an intuitive and effective approach, this method has begun to be used by others in the digital health space. One study recently reported how people with Down's Syndrome (DS) frequently struggle to make healthy food choices, and so subsequently implemented a collaborative approach to create an app that would help them do so when eating out. Using two focus groups and three design workshops, ten people with DS and their caregivers were able to propose educational accessibility and interface usability features that would be most beneficial to them. Aside from demonstrating the importance of using user-centered design processes to fully understand daily routines, decision-making, and health choices, another key insight from the study was how in populations with intellectual disabilities, caregivers ought to also be involved in the research. In addition, the researchers added to the existing criticisms of the aforementioned WAI, in that they argued, solely abiding by the WCAG24 does not ensure a website or app is accessible and usable for someone with DS, as their needs are not covered by these guidelines.³¹ This again emphasises the need for co-creation in the digital health space. It is also another reminder of our responsibility as an industry to look beyond current guidelines for direction.

The UK's NHS, in collaboration with the Good Things Foundation, launched the Widening Digital Participation program back in 2013. Throughout the three-year-long first phase of the initiative, the aims were to battle digital exclusion across the nation and arm individuals with the digital skills required to access online health information and tools. Thanks to the program, over 220,000 people improved their digital health literacy, including seniors, those of a low socioeconomic status, with disabilities, unemployed, with poor mental health, or from Black, Asian, and minority ethnic (BAME) communities. The program demonstrated several models which were crucial to its success, including the embedding

of digital health learning into broader digital skills training and informal learning, digital surgeries, community outreach events, social prescribing, and training physicians to regularly use digital health resources with their patients.³²

As a result of the initiative, 96% of the program's Health Flagship centers in the UK established partnerships with other organisations in their community, to digitally reach people or to deliver healthcare technology training, while participants reported how accessing reliable health information online empowered them to take control over their own health management, and aided conversations with their clinician. Phase 2 of the program is now underway, as the NHS works with 20 Pathfinder projects across the UK to embed and promote this digital inclusion in healthcare systems.³²

The US has also recognised the importance of patients' digital literacy and has implemented several initiatives that aim to improve their literacy and educate them about their health data.³³ The MyHealthEData initiative, announced at the 2018 HIMSS conference, is one such strategy in the US. The scheme is grounded in the belief that many individuals do not have full control over their personal health data, despite a high proportion having access to their EHRs. As patients move around within the healthcare system and receive services, they cannot easily transfer their data (essential records, test results or even basic personal information). This governmental scheme aims to move towards a patient-centric system whereby individuals face no barriers when it comes to accessing their EHRs and sending personal data to any healthcare provider or family member.³⁴

Following the announcement of this initiative, Medicare's Blue Button 2.0 was launched, allowing patients to link their Medicare health data to apps and research programs. Individuals can have the opportunity to use apps to keep track of any regular tests they may need, with reminders for when they need to schedule their next appointment; track and manage their health remotely; and organise their health information into easily understandable formats, such as charts and graphs, to facilitate conversations with their clinicians.³⁵ This national initiative opens up the accessibility of healthcare technology to those without private care, and who might not have otherwise benefited from it.

Designing with accessibility in mind: Teva as a development case study

Within Teva there has been a dedicated effort to make the healthcare technology being developed accessible to as many people as possible.

"We want to engage the patient and let various populations have the chance to use the technology regardless of their social background, age and experience." – Amir Zur, Senior Director, Head of Product, Digital Health, Teva Pharmaceutical Industries

We understand that the design of any digital healthcare app must take into account the risks versus the benefits of the technology. In addition, rather than choosing and targeting a focus market of ideal users, an app must be usable by many patients.



Collaborating with the end user in the initial stages of development enables companies to use their valuable insights to inform the content ultimately designed to improve their quality of life.³⁰

Any new technology must meet not only usability and engagement criteria but also the need for privacy, risk mitigation and security. Apps developed within Teva are designed to meet those needs and additional usability considerations.

Design considerations include simple installation (a plug and play approach), no need for accessory installation or any configuration of the software and simple, automatic connectivity and activation. These aspects all help to make the technology as usable as possible by a wide variety of patient types in the real world.

Beyond the technology itself, different users require and should be supplied with different levels of support. From support web-sites, on-boarding screens, videos, to support phone-calls and tailor-made feedback on the specific problem which the user has experienced. The user is then able to choose the relevant support channel most relevant to them.

Another important usability consideration is the ease with which the patient can share the data collected with their caregiver or healthcare provider. This means that the software ecosystem should be designed to support transparent and easy data sharing while still preserving the privacy needs of the patient.



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Gaining valuable, first-hand insight into the end user's needs and challenges when using healthcare technology can help to produce a product which is truly accessible and can benefit their lives.

Summary and conclusion

Gone are the days when healthcare professionals alone dictate patients' health management. Technology has shifted the power balance, democratising healthcare as individuals increasingly take control of their own care, and the way it is delivered. Yet there is concern, as with most health innovations, that those who need it most are not able to reap its benefits, due to accessibility issues. We can synthesise our overall recommendations for improving the accessibility of healthcare technology into two focal themes: co-creation and education.

Moving away from independent working, and towards an approach where developers have a deep collaboration with the target patient population from initial stages of development, can ensure maximum accessibility of the final solution. Gaining valuable, first-hand insight into the end user's needs and challenges when using healthcare technology can help to produce a product which is truly accessible and could potentially benefit their lives.

For any healthcare technology to have an optimal impact on patients' health and wellbeing, health literacy of vulnerable groups should be improved to raise their confidence and ability to develop digital skills. Pharma as an industry, in partnership with technology companies, can aid this by continuing to develop content with patient-centric language that is simple to understand and easily digestible for the user. A focus on education is key so these individuals can understand basic health definitions and terms, how to interpret health data or identify credible sources of health information, and comprehend the limitations of this information and its applicability. Once these individuals become familiar with basic health literacy skills, they may gradually gain confidence in their ability to regularly access and use health technology effectively, and begin to govern their own care. Doing so could increase the potential of better health outcomes and ultimately impact on quality of life.

"When people interact with healthcare technology, it can feel like a blanket approach. People may already feel like a cog in the healthcare system wheel and we don't want technology to reinforce this." – Leah Sparks, CEO & Founder of Wildflower health



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