

Embracing digital: is COVID-19 the catalyst for lasting change?

Spotlight on the uptake of digital solutions in health and human services to improve citizen health and well-being



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Foreword

At the start of 2020, a research team from Imperial College London's Institute of Global Health Innovation (IGHI), sponsored by EY, set out to investigate the challenges health and human services (HHS) organizations face in implementing digital and data solutions.

No one involved in the project imagined that a pandemic was about to put HHS providers around the world through the most extreme stress test in living memory. While the outbreak was catastrophic in its effects, it presented our researchers with an exceptional opportunity to study the sector's behavior during a pivotal moment. The EY/IGHI team collaborated with YouGov on a multi-country survey to find out how providers were using digital solutions to respond to the COVID-19 crisis; what benefits had flowed from these new ways of working; and how digital is likely to alter service delivery in the future. The team also undertook a series of expert interviews to supplement the survey data and provide further context for our analysis.

The findings reveal that rapid change is possible when circumstances demand it. Social distancing, infection control and lockdown measures compelled HHS organizations to shift, almost overnight, from in-person services to digital

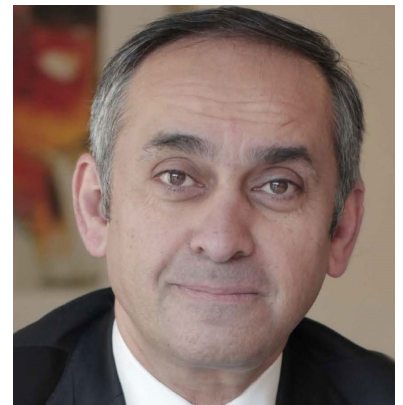


George Atalla
EY Government and Infrastructure
Leader

delivery, something that had hitherto seemed impossible. For those staff not on the immediate frontline, remote working and collaboration through digital platforms became commonplace.

Sixty two percent of HHS organizations increased their use of digital during the pandemic. Encouragingly, the majority of our respondents felt this had resulted in better access to services, a higher-quality experience for service users and raised levels of staff productivity.

The vital question now is, will this progress continue once the immediate crisis ends, or will the ground gained be lost again as conditions normalize?



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The report concludes with some practical recommendations for governments and service providers as they seek to embed new technologies and secure lasting benefits for patients, service users and practitioners. We hope you find it useful.

We will follow this report with an in-depth study of organizations from around the world that have already realized the benefits of using data and analytics to enhance their service delivery. We look forward to sharing this with you in coming months.



Executive summary and key messages

Within a matter of weeks, the COVID-19 pandemic changed the norms of daily life for citizens all around the world. Government regulations, lockdowns and other precautions to prevent the spread of the disease and safeguard the well-being of citizens have dramatically altered the environment in which HHS organizations provide their services. This paper presents an overview of the insights gleaned from a multi-country survey and series of expert interviews on how HHS providers have used data solutions and digital technologies to address the crisis and how these tools may permanently alter service delivery, moving forward.

Staff safety and maintaining access to care identified as top challenges

Across countries and sectors, maintaining the safety and well-being of staff as well as access to care due to pandemic-related restrictions have been the top challenges in responding to the outbreak of COVID-19. Other common concerns include meeting demand for services, providing services due to workforce capacity, and responding quickly to policy and regulatory changes. Though the current service delivery climate remains difficult, digital technologies and data solutions have helped to address many of the industry's top challenges.

Uptake of digital technologies and data solutions doubled during the pandemic

Prior to the pandemic, HHS organizations largely lagged behind other sectors in terms of adopting digital technologies and data solutions – though organizations in our survey were spread across the digital maturity spectrum.

Since the pandemic began, however, almost two-thirds of respondents across our sample reported an increase in the use of these tools; this shows a promising resilience, with the industry adapting to new ways of working under pressure.

In terms of specific digital technologies and data solutions, the percentage of respondents using these technologies has more or less doubled across the board since the beginning of the pandemic; though mental health services lag behind physical health and human services in terms of use. The UAE and India appear to be ahead of other countries in our sample, in terms of the percentage of organizations adopting these tools.

Phone and video consultations have seen the greatest uptake, with phone consultations being offered by 81% of HHS organizations (up from 39% before the pandemic) and video consultations available from 71% of organizations (up from 22% before the pandemic). User support tools – from online self-assessment to disease management

tools and patient portals have also increased dramatically. Other tools, including mobile sensors or wearables, have also seen rapid increases, but are still not commonplace among HHS providers. However, greater provider and user familiarity with these solutions may lead to their continued use in the future.

Unprecedented sense of urgency enabled HHS organizations to overcome implementation barriers

A number of barriers, specific to HHS, have prevented widespread adoption of digital technologies and analytical solutions in this sector. Prior to the pandemic, practitioner concerns – including the potential for increased administrative duties, loss of interactions with service users and reliance on data insights over professional judgment – were most prevalent among our respondents, with 40% citing this as a barrier to implementation. IT interoperability and adaptability were listed as top barriers by 33% of the respondents. Other issues, spanning lack of funding or reimbursement for digital services, lack of skills and expertise, and lack of overall strategy were also among the top concerns of respondents.

The extraordinary circumstances amid the pandemic have helped HHS organizations to overcome some of these barriers to rapidly implement digital and data solutions. Many countries temporarily relaxed regulatory constraints and approved payment



for remote or digital services that may not have been reimbursed prior to the pandemic. Other factors, such as ensuring staff and patient safety and the need to pivot to virtual or remotely delivered services to continue operations, were also critical. Finally, many suppliers waived or reduced fees to facilitate rapid adoption of these technologies in response to the pandemic.

Within our survey, alleviation of practitioner concerns, rapid leadership buy-in and strategic plan adoption, and improvements in digital literacy were listed as the top enablers for greater adoption of these solutions. Yet, other factors, including availability of funding and reimbursement for new ways of working, improvements in IT operability, alleviation of ethical and privacy concerns, and regulation and governance changes were also common responses.

As key factors were quite varied, this suggests that there was no overwhelming “silver bullet” that enabled this change.

Digital and data solution adoption has improved care access and staff productivity

Despite the rapid speed of digital technology adoption and significant disruption to pre-pandemic ways of working, most respondents report that the use of these solutions has had a number of positive effects.

A majority of respondents in all countries reported that digital technologies and data solutions have increased the productivity of staff, ranging from 54% in the UK to 86% in the UAE. Further, a majority of respondents, from five of the six countries surveyed (all but the UK), reported that these solutions

were effective in improving the quality of experience, access to care, and outcomes for patients and service users.

Encouragingly, a further 66% of global respondents agreed that their staff quickly adapted to using new digital tools since the onset of COVID-19. Around 61% of respondents agreed that their organizations are using these digital solutions more effectively than before the pandemic began and 58% reported that digital solutions have made operating models more efficient.

However, it is important to note that despite the positive effects of these solutions, there are concerns about access to HHS for the vulnerable as well as the effects of delayed care services, which could affect quality and outcomes down the line.

Widespread digital technology and data solution use will continue in the future, but longevity is dependent on a variety of factors

Given the current climate, a return to “business as usual” is unlikely anytime soon, and digital technologies and data solutions are likely to continue to play a key role in HHS delivery.

Approximately half of survey respondents reported planned investments in digital technologies and data solutions over the next three years, with India having the highest proportion of positive respondents (75%).

The majority of respondents also indicated that their organizations are likely to continue using all of the patient- and service user-facing digital technologies and data solutions they have used during the pandemic.

Phone and video consultations appear most likely to remain in use after the pandemic, across sectors and types of organization.

Despite these intentions to continue the use of specific tools, a sizeable percentage of respondents – across countries, sectors and services – indicated that the introduction of digital technologies and data solutions was a temporary measure to address challenges during the pandemic period. These responses likely reflect the complexities involved in predicting future use. As indicated by 30% of the respondents who neither

agreed nor disagreed, there are a number of uncertainties regarding the continued use of these solutions after the pandemic.

Although HHS providers have lagged behind other sectors in adopting digital solutions, the COVID-19 pandemic has shown what is possible when circumstances lead to an urgent need for change. Whether the use of these solutions “sticks” comes down to a number of key factors.

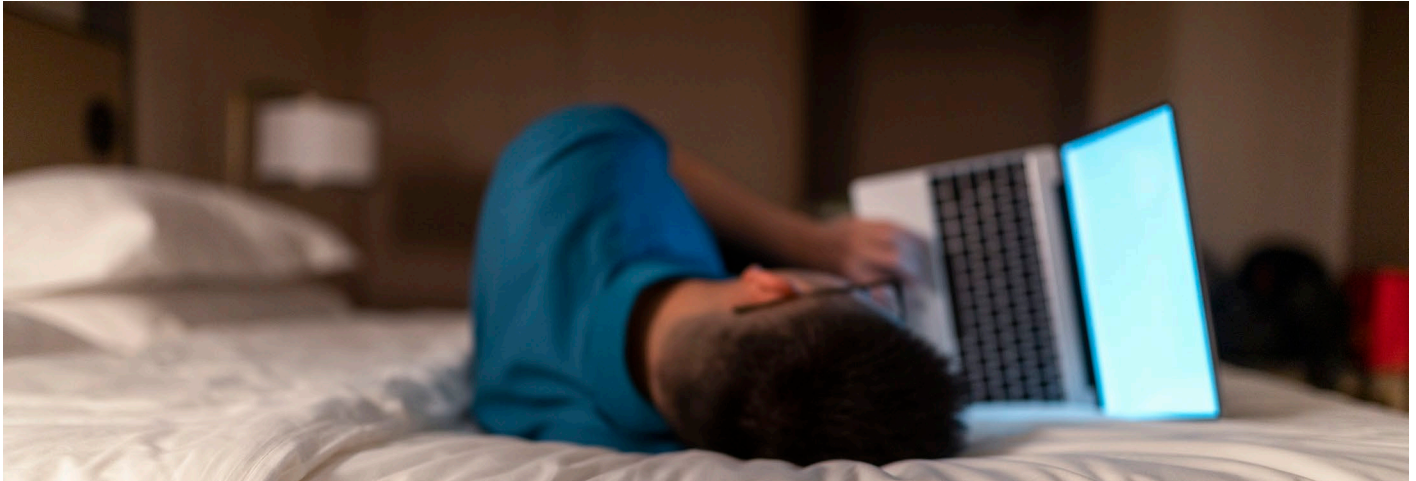
- ▶ Many governments made emergency funding available to implement digital technologies and analytical tools, and also introduced temporary reimbursement for remote services. Unless governments and payers make permanent changes to incentives and reimbursement, the use of digital solutions may be unsustainable for many.
- ▶ Interoperability continues to be a major issue in HHS, particularly when solutions are rapidly implemented without rigorous testing. Unless organizations develop coordinated strategies and infrastructures to support digital solutions and data standardization, they will struggle to derive the full benefit of these tools and technologies in the future.
- ▶ As many countries temporarily relaxed privacy and data regulations during the pandemic, organizations will need to ensure that newly implemented

tools and technologies can meet the necessary standards following the pandemic.

- ▶ Service providers must also see the benefits of continuing to use digital technologies and analytical solutions. Unless these tools are user-friendly and do not contribute an additional administrative burden, many providers may be hesitant to continue using them once they are no longer critical for service delivery.
- ▶ Finally, the preferences and demands of HHS users will also play a role. Many service users have become more accustomed to technology use during the pandemic and will likely continue to prefer solutions that offer speed and convenience. However, governments must also ensure that the benefits of digital technologies and data solutions reach across the population, particularly to vulnerable groups with limited digital access.

Mental health services report lower uptake of solutions, compared with physical health or social services

Mental health respondents were more likely to report that they had no plans to implement the use of digital technology and data solutions prior to the pandemic (16%, compared with 10% for both physical health and human services) and less likely to report that these solutions



were well embedded in their workflows (14%, compared with 18% and 19% for physical health and human services, respectively).

Mental health services organizations in our sample were also less likely to have implemented these tools during the pandemic – with the exception of phone and video consultations – compared with physical health and human services providers. For instance, only 25% use artificial intelligence (AI)-powered diagnostic tools, compared with 45% for physical health and human services.

Regarding the future, mental health services are less likely to report planned investments in AI-powered diagnostic solutions over the next three years, at 43%, compared with 49% and 53% for physical health services and social services, respectively. However, approximately one third of respondents from all sectors were unsure of future investment plans.

UAE and India report the greatest use of digital technology and data solutions, with UK lagging behind

By country, organizations were spread along the spectrum of digital technology and data solution adoption prior to the pandemic, reflecting a wide range of digital maturity starting points and significant variations, even within countries. HHS organizations in Italy, however, had the lowest percentage of respondents in the two most advanced levels of digital adoption (33%, compared with 42% in both India and the US) and the highest percentage in the two least advanced levels (32%, compared with 25% in the UK and 26% in the UAE).

Since the onset of COVID-19, a majority of respondents in all countries reported that their use of digital technologies

and data solutions has increased. The use of phone and video consultations was widespread across all countries, but there were significant variations in the use of other data solutions and digital technologies. Overwhelmingly, the percentage of respondents using specific digital technologies and data solutions was higher in the UAE and India, compared with the other countries in our sample. On the other hand, the UK reported the lowest uptake of solutions across the board; however, the UK also had the biggest proportion of “don’t know” responses (up to 24% in some cases), so this should be taken into account when interpreting the data.

Looking to the future, India (75%), Italy (54%) and the UAE (53%) had a clear majority of respondents indicate that

Executive summary and key messages

they plan to further invest in these solutions over the next three years. Yet, this question also had a high percentage of respondents not knowing their organization's plans for investment (more than 50% in the UK). The US had the highest percentage of respondents indicate that their organization did not plan to invest in these solutions (22%), though this nevertheless indicates that investment in this area is likely to be widespread across countries.

Survey limitations

As HHS organizations continue to innovate and adapt to the challenges of operating throughout the pandemic, technology and data solution adoption may continue to change. Multi-country surveys do not fully capture the nuance of underlying contextual and structural differences in HHS provision across countries; these factors can affect not only baseline responses, but also the barriers and enablers to the uptake of digital and data solutions. The seniority

level of respondents also varied across countries, with junior- and middle-managers making up 75% of the UK sample, compared with only 30% for the UAE. Finally, there was a high level of uncertainty across a number of questions, with one third or more of respondents indicating that they were unsure of their organization's actions or intentions. While this may partially reflect the lack of visibility of more junior managers into strategic decisions, it also points to the uncertainty around post-pandemic care provision.



Introduction

Over the past decade, industries ranging from banking to retail to entertainment have used digital technologies and data solutions to transform their services and user experiences; yet health and human services (HHS) organizations have largely struggled to implement digital and analytical solutions at scale. However, with the onset of the COVID-19 pandemic in early 2020, HHS organizations have rapidly deployed digital and data solutions to deliver remote services and support users and staff in new ways.

In the UK, for instance, 93% of GP appointments were conducted remotely in mid-April of 2020 – up from 20% just a few weeks prior. Requests for repeat prescriptions through the NHS app also doubled from February 2020 to March 2020.

At the same time in the US, the New York City Human Resources Administration (HRA) Office canceled all in-person appointments and made available online applications for support (e.g., Cash Assistance and Supplemental Nutrition Assistance Program), requiring effective underlying data collection and processing methods.

As organizations continue to deal with the pressures of the pandemic and a “second wave” of infections, digital solutions and analytical tools remain essential for the quality of service provision. Yet, their rapid deployment under such exceptional circumstances leaves a number of uncertainties regarding their effectiveness, sustainability and continued use in the future – particularly after the strict pandemic measures subside.

We collaborated with YouGov to commission a multi-country survey to test the views of HHS providers on these issues (further details on survey methodology and composition can be found in the Appendix). Survey responses, supplemented with insights gleaned from expert interviews, are summarized and examined in the following sections.

This spotlight report aims to provide an overview of how HHS organizations have used digital technology and data solutions throughout the pandemic, the effects of their use on service users and staff, and how the application of these tools during the pandemic may shape service delivery in future.

1

Early responses to the COVID-19 pandemic

This section outlines the baseline levels of digital technology and data solution adoption of HHS organizations at the start of the pandemic, top challenges experienced at the outset of the outbreak, and the types of digital and analytical tools implemented to address these issues.

Digital and data solution adoption prior to COVID-19

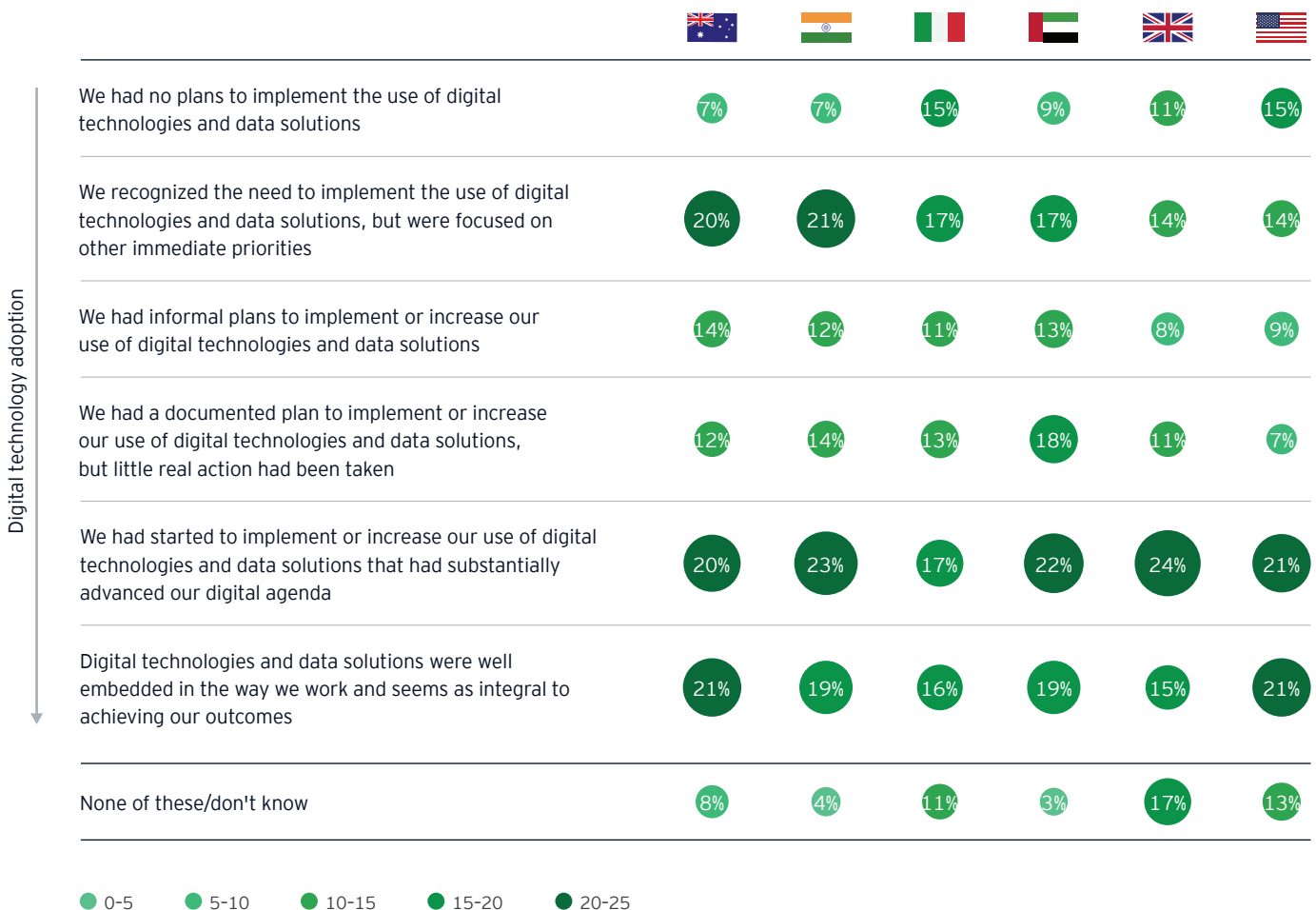
Prior to the pandemic outbreak, HHS survey respondents were somewhat evenly spread across the spectrum of maturity of digital technology and data solutions. 11% of organizations had no plans to implement these solutions, while 18% of organizations had successfully embedded these tools in the way they work. These trends largely held true across HHS sectors as well, though mental health respondents

were more likely to report that they had no plans to implement the use of digital technology and data solutions (16%, compared with 10% for both physical health and human services) and less likely to report that these solutions were well embedded in their workflows (14%, compared with 18% and 19% for physical health and human services, respectively).

By country, organizations were also spread along the spectrum of digital technology and data solution adoption,

reflecting a wide range of digital maturity starting points and significant variations even within countries, as shown in figure 1. HHS organizations in Italy, however, had the lowest percentage of respondents in the two most advanced levels of digital adoption (33%, compared with 42% in both India and the US), and the highest percentage in the two least advanced levels (32%, compared with 25% in the UK and 26% in the UAE).

Figure 1. Status of digital adoption prior to the COVID-19 outbreak



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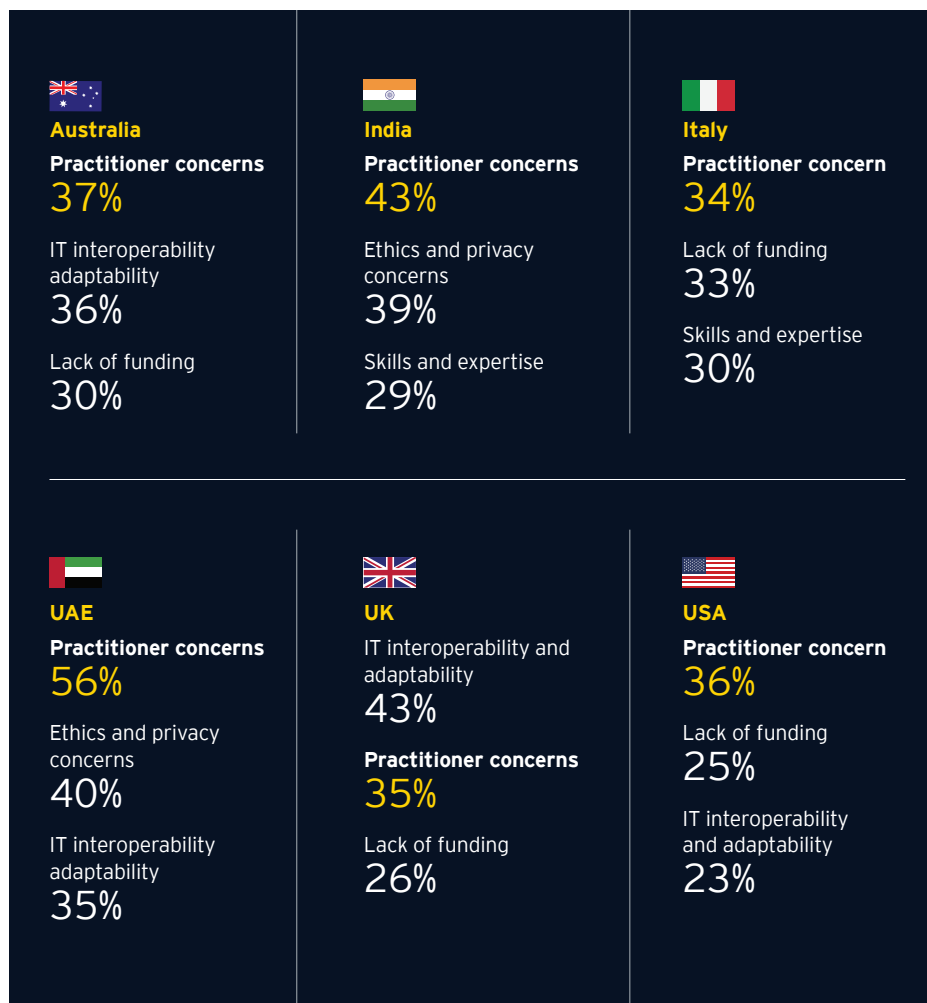
Early responses to the COVID-19 pandemic

As noted in the introduction – and further explained in the forthcoming report, *Harnessing the power of data: Can reality catch up with ambition?* – HHS organizations often lag behind other sectors in the implementation of digital and data solutions. Several sector-specific factors have affected the pace of adoption, ranging from organization level (regulation, funding and staff buy-in) to technology barriers (privacy, interoperability, solution design and data analytics) to user challenges (misinformation and lack of trust).

Practitioner concerns – including the potential for increased administrative duties, loss of interactions with service users, and reliance on data insights over professional judgment – were most prevalent among our sample, with 40% of responses¹ citing this as a barrier to implementation. IT interoperability and adaptability were listed as top barriers in 33% of responses. Other top issues include lack of funding or reimbursement for digital services (includes virtual care models and inadequate financial resources to acquire tools), lack of skills and expertise (includes lack of expertise to select the “right” technology solution for the organization, and inadequate staff digital literacy), and the concerns around ethics and privacy/data protection (using technology in making decisions about individuals and ability to protect an individual’s identity and personal information).

These responses held true across HHS sectors, with physical health, mental health and human services reporting the same top five barriers.

Figure 2. In your organization, which, if any, barriers to the implementation of digital technology and data solutions were most prevalent prior to the outbreak of COVID-19?*



Practitioner concerns were also the most commonly listed barrier across five of the six countries in our sample, with the exception of the UK, which listed IT interoperability and adaptability first. Nearly 40% of the respondents from India and the UAE listed ethics and privacy concerns as one of the most prevalent barriers – significantly higher than the other countries in our sample,

with only 11% of UK respondents and 20% of US respondents, respectively, citing this as a main barrier. The underlying reasons behind this discrepancy are not immediately clear, though they are likely a combination of cultural factors, citizen attitudes, and information governance policies and infrastructure.

Challenges faced by organizations during the pandemic

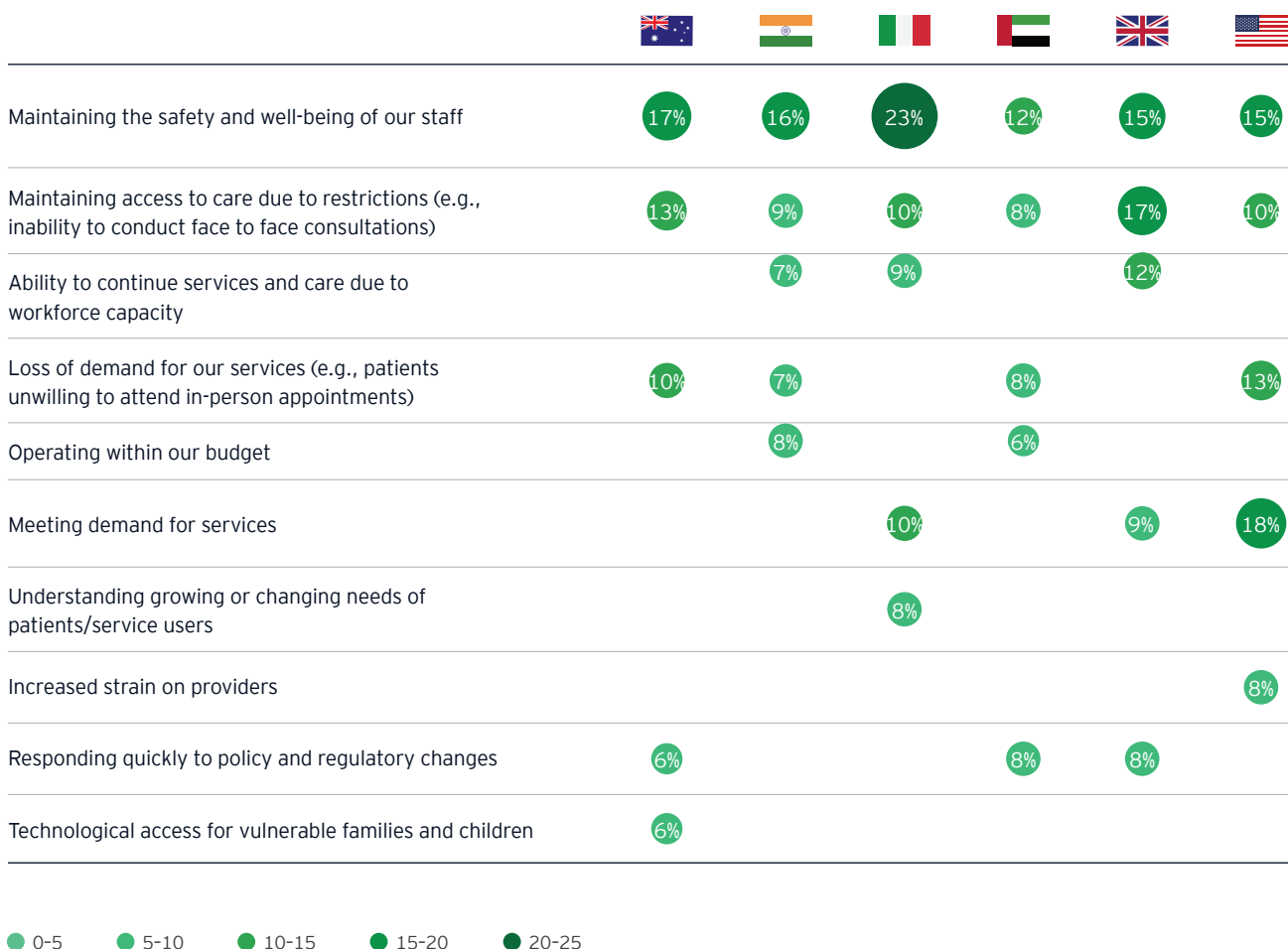
COVID-19 has presented an unprecedented global challenge. As of mid-October 2020, nearly 38 million cases were confirmed, resulting in more than one million deaths.⁴ Social distancing, infection control and lockdown measures have disrupted

the daily lives of billions of people. HHS organizations, like those across many sectors, have faced significant challenges during this time.

According to survey respondents across countries and sectors, maintaining the safety and well-being of staff as well as access to care due to restrictions are the top challenges in responding to the outbreak of COVID-19. Service

demands, workforce capacity, and policy/regulatory changes are also among the top challenges. Increased strain on providers and access to technology (e.g., internet and mobile technologies) for children and vulnerable families are also among the top five concerns for respondents from the US and Australia, respectively (as shown in figure 3).

Figure 3. And which one do you believe is the biggest challenge your organization has faced as it responds to the outbreak of COVID-19?*



¹ Responses are included here rather than respondents as survey participants were given a range of options to select. The responses are an aggregate of the different responses. This is the same for Ethics and privacy concerns and Lack of funding.

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Early responses to the COVID-19 pandemic

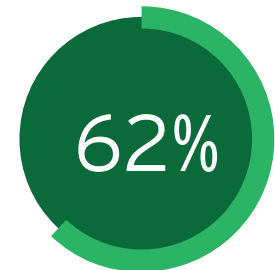
Digital and data solution responses

Digital technologies and data solutions – despite their barriers to implementation – have been rapidly deployed in HHS organizations during the course of the pandemic due to the need to limit viral exposure across providers, service users and the wider community (see figure 4).⁵

Due to concerns for the safety and welfare of citizens and staff, as well as lockdown or movement restrictions, 62% of respondents have increased their use of digital technologies and data solutions since the outbreak of the pandemic. This proportion increases to 69% for respondents from mental health

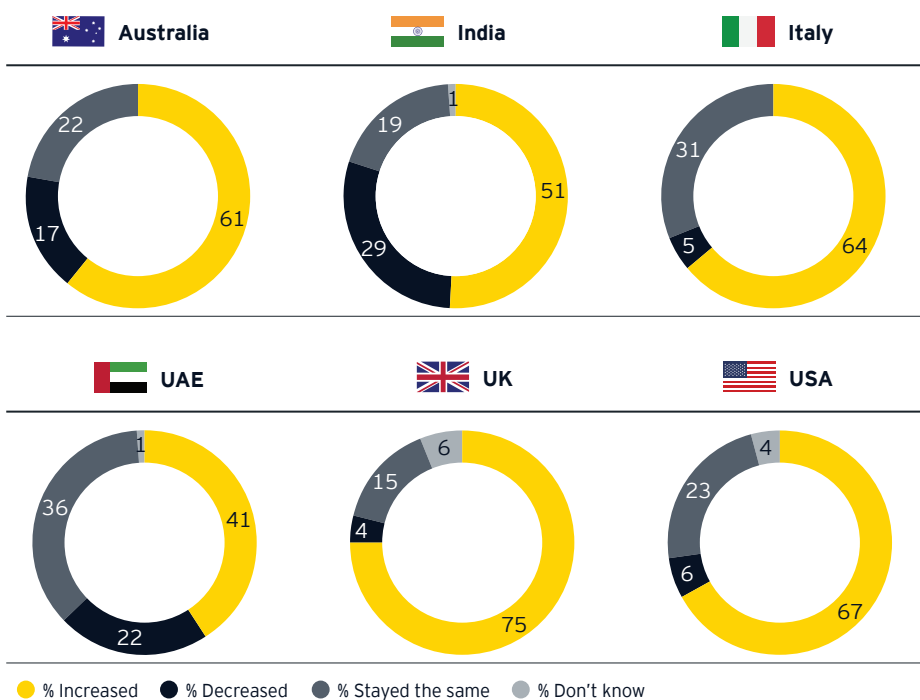
services (compared with 58% for both physical health and human services), providing an encouraging picture of how HHS organizations have pivoted to meet service demands, amid a challenging environment.

Interestingly, however, 12% of respondents indicated that they decreased their use of these solutions. This figure increases to 22% and 29% for HHS organizations from the UAE and India, respectively. This may signal that some digital solutions in use prior to the pandemic were in the experimental stage or not essential to core service delivery. Due to increasing pressures brought on by the pandemic,



of respondents have increased their use of digital technologies and data solutions.

Figure 4. Since the outbreak of COVID-19, my organization's use of digital technologies and data solutions has:



some HHS providers may therefore have shifted resources to cover the additional care burden; for instance, a hospital reallocating part of its digital budget to cover additional resources for personal protective equipment or care for COVID-19 patients within the ICU. As shown in the next section, uptake of digital solutions has been dramatic and widespread, suggesting that the above question may not have captured this type of a nuance.

Key enablers for uptake of digital technology and data solutions

While the pandemic has presented unprecedented challenges for HHS providers, it has also led to a rapid shift in the uptake of digital technologies and analytical tools to meet these challenges.

This accelerated pace of adoption has been driven by a number of factors. At the most basic level, a shift to digital technology and data solutions was a necessity. Government regulations aimed at curbing the virus – including restricting movement or gathering and enforcing closure of some in-person services – essentially forced care providers to adapt to new ways of working in an unprecedented way. In the UK, for example, the National Health Service (NHS) issued guidelines to primary care providers to use remote consultations to triage patients prior to appointments and to shift to remote consultations, where clinically appropriate⁶. Nearly all countries around the world enforced the closure of schools for in-person learning (affecting 1.5 billion children at the height of the pandemic), prompting educators to turn to technology for remote-learning options⁷.

Many countries and local authorities have also temporarily eased restrictions on privacy and data protection in order to accelerate the implementation of digital and data solutions to combat the pandemic⁸. Meanwhile, HHS leaders have had sufficient urgency to quickly reallocate resources to focus on continuity of service delivery and protecting the safety of staff and service users. Many regulators have also fast-tracked procurement processes to complete purchases and implementations more quickly. Emergency funding and partnerships with the private sector – for instance,

“ Top enablers: alleviation of practitioner concerns, rapid leadership buy- in and strategic planning and digital literacy.”

in developing test and track applications – have further driven rapid adoptions of these solutions.

While resistance to data solutions and digital technologies has often been cited as a barrier to adoption, both HHS staff and service users have also been forced to adapt quickly due to previously mentioned changes in care delivery.

Within our survey, alleviation of practitioner concerns, rapid leadership buy-in and strategic plan adoption, and improvements in digital literacy were listed as the top enablers for greater adoption of these solutions. Yet, other factors including availability of funding and reimbursement for new ways of working, improvements in IT operability, alleviation of ethical and privacy concerns, and regulation or governance changes were also common responses.

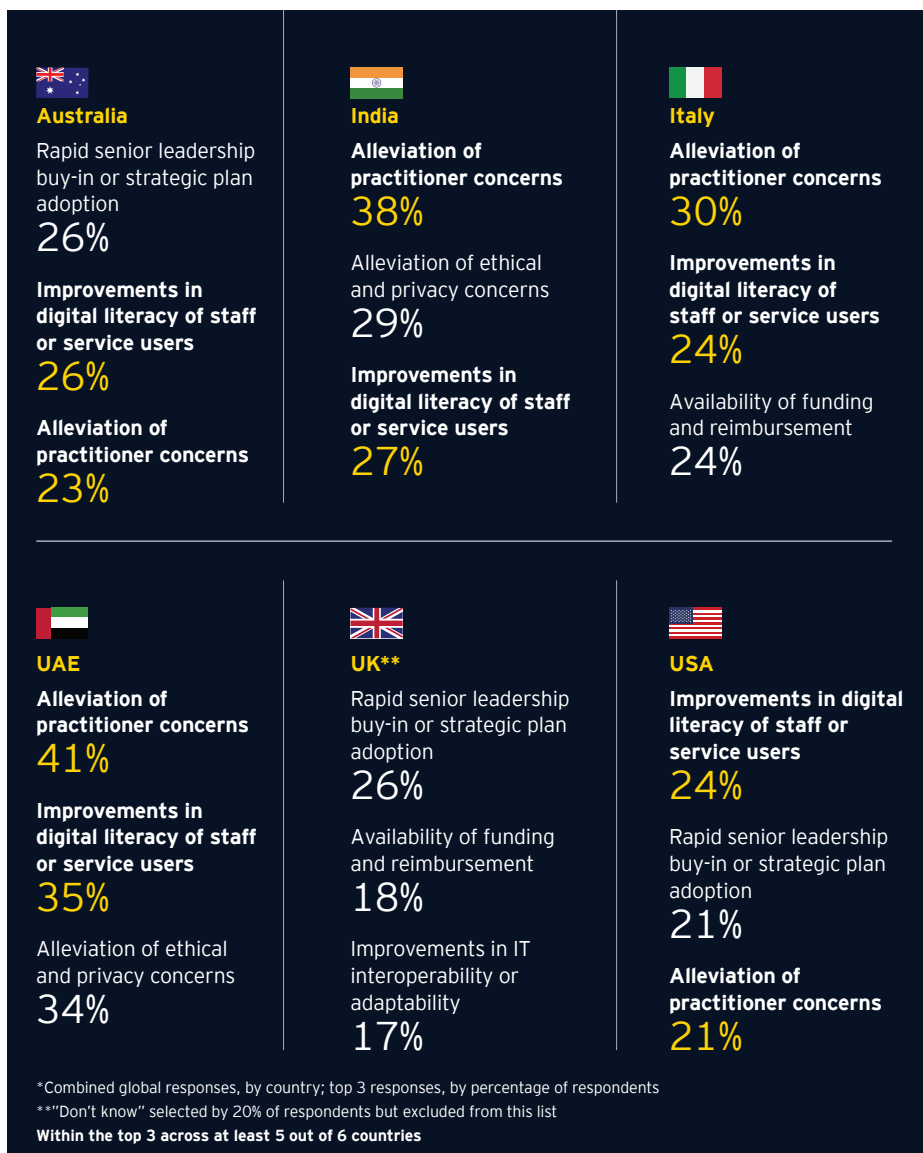
Key factors were varied across our sample, suggesting that there was no overwhelming “silver bullet” that enabled this change. Rather, the key enablers were influenced by a number of factors, including most prevalent barriers identified at the onset of the pandemic.

Alleviation of practitioner concerns and improvements in digital literacy of staff or service users were among the top three responses across five out of six countries in our survey (with the exception of the UK), as well as each of the HHS sectors (see figure 5 overleaf). Rapid leadership buy-in and strategic plan adoption was also cited by three of the six countries, highlighting how decisive action from key decisionmakers can drive swift changes in operation. Other key enablers largely mirrored the key barriers to adoption, prior to the onset of the pandemic. The UAE and India, for instance, identified ethical and privacy concerns as atop three barrier and the alleviation of these concerns as a top three enabler. In the UK, funding and reimbursement, and IT interoperability or adaptability were also listed in the top three barriers and enablers; however, 20% of respondents didn't know which factors enabled their organizations to adopt these solutions. This may reflect the fact that more than 50% of UK respondents were from organizations with more than 1,000 staff, which could limit visibility of strategic decision making for junior or middle managers.

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Figure 5. Which, if any, of the following have been key factors that have enabled your organization to adopt digital and data solutions since the COVID-19 outbreak?*



Types of solutions and technologies

HHS organizations have employed a wide range of digital technologies and analytical solutions to directly serve both patients and service users, and staff since the outbreak of the pandemic.

Some of the most common solutions have supported the shift to remote consultations in order to minimize in-person contact and risk of transferring the virus. In Canada, for example, between 5% and 15% of primary care appointments took place by phone and 3% by video conference prior to the pandemic; now approximately two-thirds of visits are happening virtually.⁹ In the UK, the Cornerstone Partnership provides immersive technology to create a virtual "meeting room" for therapy sessions for young people, thereby replacing in-person sessions.¹⁰

Other HHS organizations have implemented tools to monitor patients remotely – either directly through digital devices and mobile sensors or through apps that allow patients to input data or report problems. In the UK, for instance, many care homes have set up "virtual wards" where remote monitoring devices, such as oximeters, can detect early signs of patient deterioration to promote early intervention, while limiting medically unnecessary in-person visits¹¹.

Many countries have also developed and implemented digital and data solutions to directly address the COVID-19 pandemic. For example, many countries launched test and trace apps to identify potential new cases and curb the spread of the outbreak. Singapore, for instance, launched a mobile phone application that uses Bluetooth signals to track and record when individuals are in proximity to each other; if an individual is diagnosed with COVID-19, the Ministry of Health can access the data to identify contacts of the infected person.¹³ An EY team also helped the Chilean Government to develop a digital platform that provides telemedicine and digital triaging of COVID-19 patients, coupled with advanced data gathering and insights to help curb the spread of the disease. The digital platform also enables a high level of collaboration and data sharing between major cities and even the most remote hospitals.

Data solutions have also been employed to help monitor vulnerable service users and to direct resources in the most efficient manner. South Australia's Vulnerable Persons' Board, for example, reviewed real-time data on a weekly basis – using a range of child protection, health, police and other indicators – to monitor and assess risk and need, monitor pandemic impacts and inform state-wide service responses, practical supports, planning and delivery at a local level. Barking and Dagenham Council –

based in London – has implemented a system to collate data from across the council to identify the most vulnerable residents in the borough. An interactive dashboard enables the council to prioritize, within the vulnerable cohort, by considering risk factors that will be exacerbated directly by the virus or by the sanctions in place to mitigate its impact. The in-built case management functionality then enables cases to be assigned to teams and interventions to be tracked. This approach has also furthered engagement and collaboration across social services and public health departments, which had previously operated in silos.

Other common digital and data solutions include patient-facing tools, such as service-portals, self-assessment, and patient engagement tools. Many governments are using digital information portals, AI chatbots, mobile apps and social media platforms to directly connect with people and ensure that they're well informed about the virus and can protect their own health and well-being. The Czech Ministry of Health, for example, launched a dedicated COVID-19 portal and AI chatbot to provide trustworthy information and respond to queries, while the Estonian Government created the automated chatbot, Suve, which is integrated into more than 20 public websites and is continuously updated with the latest information. Also, the

UK, Singapore and South African governments use WhatsApp to provide daily updates, prevention tips, testing center information and enforcement measures.^{14,15}

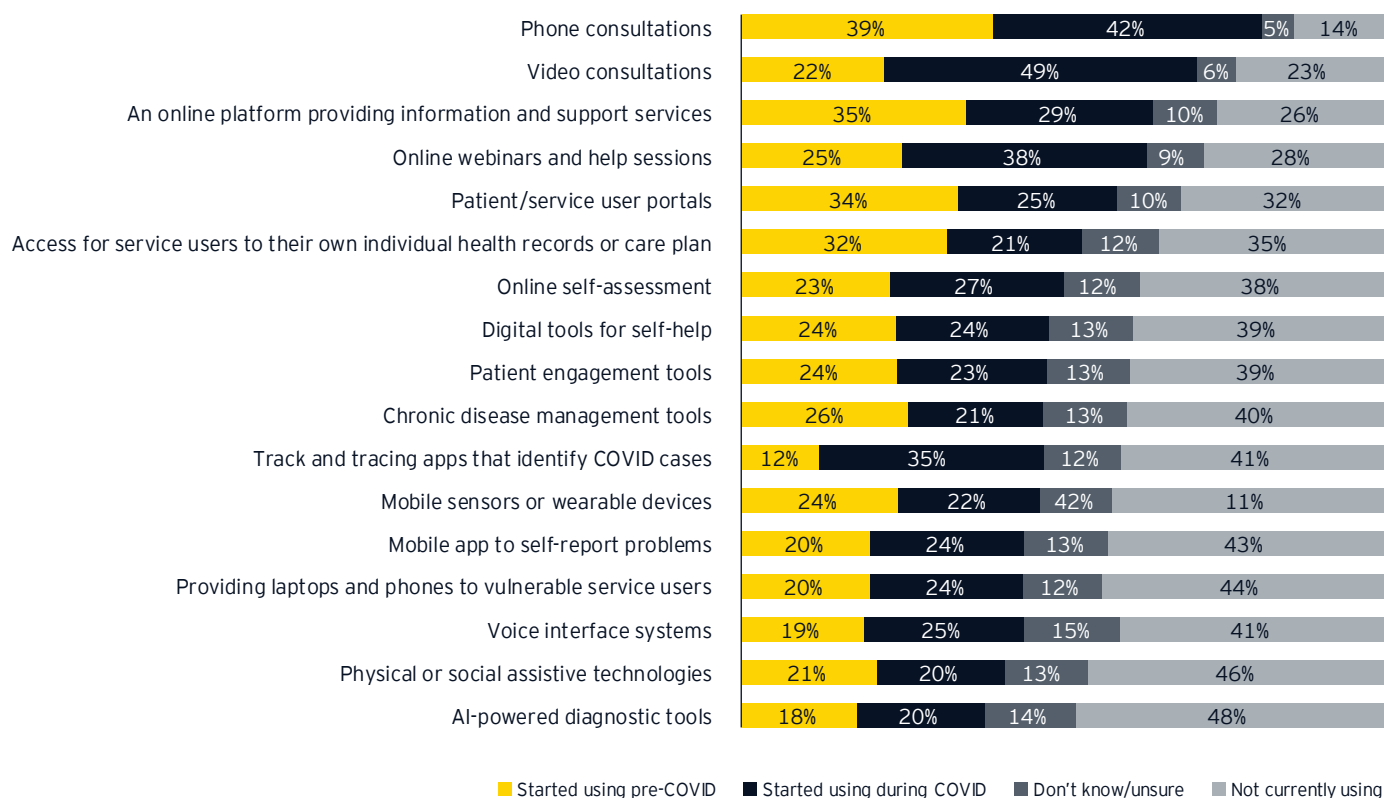
As shown in figure 6 (overleaf), the use of digital technologies and data solutions for service users – across all categories – has nearly doubled among our respondents.

Phone and video consultations have seen the greatest uptake within our sample, with phone consultations being offered by 81% of HHS organizations (up from 39% before the pandemic) and video consultations available from 71% of organizations (up from 22% before the pandemic). These tools provide direct substitutes for in-person consultations where face-to-face interactions may endanger the well-being of patients or staff or be limited by lockdown restrictions, explaining their widespread deployment throughout the pandemic. User support tools – from online self-assessment to disease management tools and patient portals have also increased dramatically. Mobile sensors or wearable devices and apps to self-report problems have also roughly doubled in use and are now available in 46% of the organizations in our sample. While the uptake of these tools was hastened by the need to limit in-person contact through remote services, greater provider and user familiarity

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Figure 6. What, if any, types of digital technology and resources does your organization make available for patients or service users?*



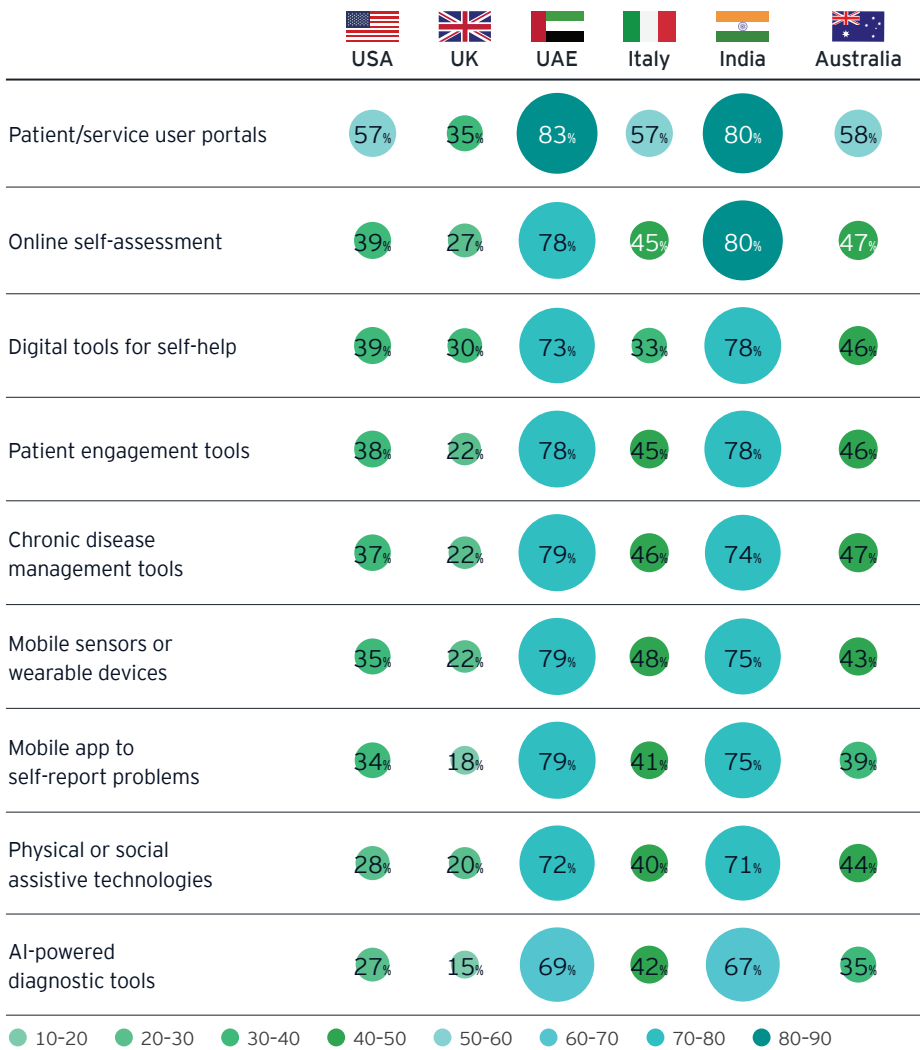
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The adoption of digital technologies and data solutions has nearly doubled during the pandemic.

with these solutions may lead to their continued use in the future. The use of these tools will also drive an increase in user-generated data, in addition to routine administrative data, which HHS providers may be able to leverage to better target service users needing intervention.

At the country-level, use of phone and video consultations was also widespread across the board, yet there was significant variation in the use of other data solutions and digital technologies (as shown in figure 7).

Overwhelmingly, the percentage of respondents using specific digital technologies and data solutions was higher in the UAE and India, compared with the other countries in our sample. On the other hand, the UK reported the lowest uptake of solutions across the board; however, the UK also had the biggest proportion of “don't know” responses (up to 24% in some cases), so this should be taken into account when interpreting the data. Despite this uncertainty, it appears that a higher percentage of organizations in India and the UAE were using these solutions

Figure 7. What, if any, types of digital technology and resources does your organization make available for patients or service users?*



prior to the pandemic, which may have helped to establish a number of fit-for-purpose options that could be adapted to other organizations. It is also possible that our sample may reflect a selection bias of more technologically advanced organizations in these regions, particularly in India, rather than be indicative of overall country-level trends.

Further, it's interesting to note that India and the UAE had the highest percentage of respondents say their use of digital solutions had decreased during the pandemic, while also reporting significant increases in the percentage of organizations using specific analytical and digital technologies. The UAE, in particular, had already invested heavily

“

The use of tools will drive user-generated data, which HHS providers may be able to leverage to better target service users needing intervention.

in digital technologies, such as AI, so had much of the infrastructure in place, to scale up. There is some evidence that the UAE's relatively recent urban development has enabled it to be more agile than other more established health care systems.¹⁶ India, meanwhile, had already been investing heavily in telemedicine and other solutions to reach its rural populations, particularly given its relatively low ratio of physicians to population.¹⁷

When reviewing results across service sectors, mental health services organizations in our sample were less likely to utilize other solutions for service users – with the exception of phone and video consultations – compared with physical health and human services providers. For instance, only 25% of mental health services organizations use

Chapter 1

Early responses to the COVID-19 pandemic

AI-powered diagnostic tools, compared with 46% and 45% for physical health and human services, respectively. Likewise, they were less likely to use mobile apps for users to self-report problems (28%, compared with 51% and 49%) and mobile sensors or wearables (29%, compared with 55% and 54%). This also holds true for digital tools for self-help (44%, compared with 53% for physical health and human services) and online self-assessment (40%, compared with 57% and 53%), though to a lesser degree. This is partially explained by lower levels of uptake from both patients and clinicians in this HHS area as well as the nature of mental health services; mental health disorders are typically diagnosed through in-person clinical consultations, rather than being confirmed by a biomarker or technical tool.¹⁸ Nevertheless, a myriad of digital solutions have shown promise in improving mental health outcomes and service provision – from streamlining triage to patient self-management to improving access – indicating an opportunity for future service improvement.¹⁹

“
Mental health services were less likely to utilize digital tools.”



A photograph of a man with grey hair, wearing a dark jacket over a plaid shirt, sitting in a wicker chair. He is looking towards a large television screen that is turned off. The room is dimly lit, with light coming from a window on the right. A large, semi-transparent number '2' is overlaid on the left side of the image. A vertical yellow line is on the far left edge.

2 Developments throughout the COVID-19 outbreak

This section outlines how digital technology and data solution adoption by HHS organizations has impacted service delivery, patient experience and staff productivity thus far throughout the pandemic.

Impacts of the pandemic on the ability to deliver services

The pressures caused by the pandemic have undoubtedly been felt by every industry, including HHS. Despite these challenges, the pandemic's impact on service delivery is not clear-cut. The use of remote consultations, for instance, has been shown to be effective for many routine services – particularly in primary care. These types of consultations also reduce travel time and offers flexibility for both staff and patients.²⁰ Service user satisfaction is also high for these kinds of services, with a recent survey showing that 25% of people plan to continue using phone or video appointments at the same level even after restrictions are lifted.²¹ However, quality undoubtedly suffers when some services are provided remotely. Remote learning, for instance, deprives children of the opportunity for peer interaction and social development. Meanwhile, juvenile court proceedings and social worker services that are conducted remotely may miss nuances and red flags that are picked up in person. Reliance on remote solutions also has the potential to exacerbate inequalities for vulnerable people, particularly those without reliable internet access.

In the health care service sector, in particular, the pandemic has also strained care provision due to the influx of patients with COVID-19. In some regions, hospital ICUs have reached capacity due to seriously ill COVID-19 patients.²² Reallocating resources to

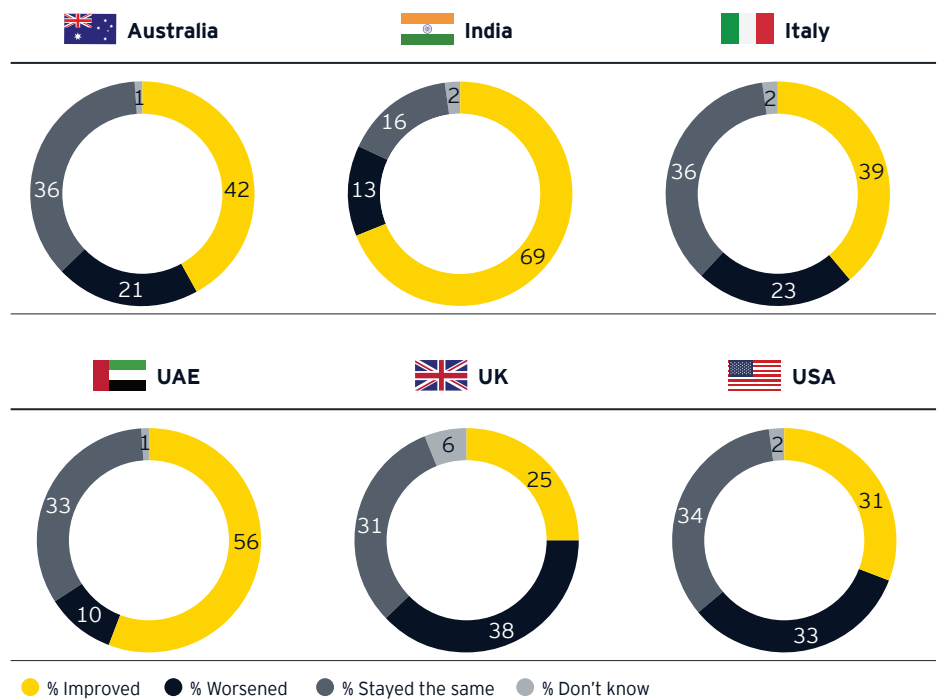
combat the pandemic has also disrupted the delivery of other health care services, including screening and care for noncommunicable diseases. A WHO survey in May 2020, for instance, found that 42% of countries had disrupted cancer services, while 63% had disrupted rehabilitation services.²³

Staffing capacity has also impacted service delivery, particularly if staff members are required to take time off due to illness or quarantining. In adult social services in the UK, for example,

the average number of days lost to sickness reached 8% between March and June 2020, compared with 2.4% prior to the outbreak.²⁴ Other key challenges include service user reluctance to seek care services due to pandemic concerns, and budgetary or funding concerns.²⁵

Despite these challenges, the majority of our survey respondents reported that their capability to deliver services had either stayed the same (30%) or improved (41%). See figure 8.

Figure 8. Compared with before the outbreak of COVID-19, how has your capability (organizational, technical, human resources and workforce skills) to deliver health and social care services to patients or service users changed?



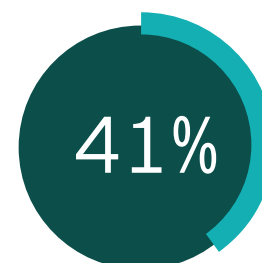
Mental health services had a lower percentage of respondents reporting that their capability had improved (36%) compared with social services (40%) and physical health services (46%).

This held true across all countries and sectors, though the UK had the highest proportion of respondents report that their capability to deliver services had worsened (38%), followed by the US at 33%. Meanwhile, a majority of participants from India and UAE actually reported that their capability to deliver service had improved since the pandemic – at 69% and 56%, respectively. This may tie to the fact that organizations in these countries reported employing a broader range of digital and analytical solutions to support service delivery throughout the pandemic. The next section explores how digital technologies and data solutions have contributed to this.

How have digital technologies and data solutions helped HHS organizations?

Respondents reported that digital technologies and data solutions have created a wide array of benefits for their organizations as well as patients and service users, as shown in figure 9. Nearly one third of global respondents (30%) reported enabling practitioners to work remotely as a top three benefit. Other common responses were enabling users to access online direct help (21%), improving care quality (18%), and improving service and user engagement (18%). However, 5% of the respondents indicated that these solutions have not created any benefits.

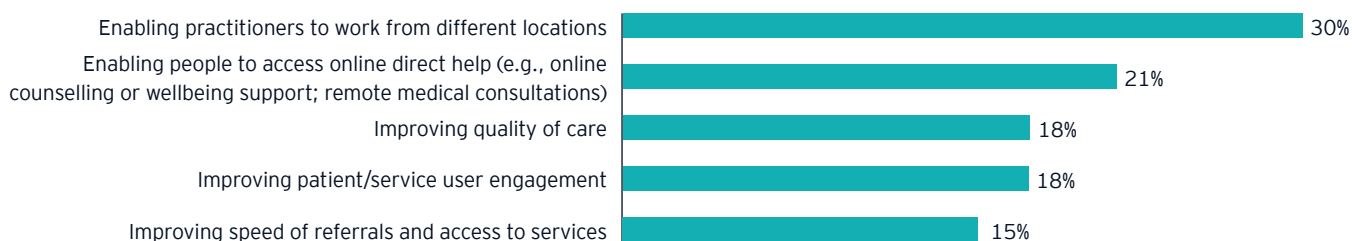
The top benefits were largely uniform across countries, as well as service sectors, with all countries and service sectors listing enabling practitioners



41%
of respondents reported that their capability to deliver services had improved.

to work from different locations and enabling people to access online help directly as two of the top three responses. This links back to the top challenges posed by the pandemic, in terms of staff safety and patient access.

Figure 9. What, if any, are the top three benefits that digital technologies and data solutions have created for your organization and patients or service users?*



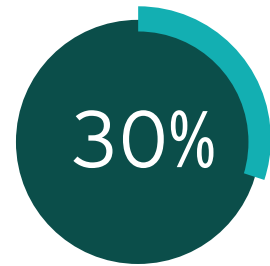
*Combined global responses; participants were able to choose up to 3 responses, so totals will not sum to 100%

Most impactful solutions

Since the onset of the pandemic, HHS organizations have markedly increased the number and breadth of data solutions and digital technologies they provide to service users. We asked respondents which three tools have most helped them to deliver better and more efficient outcomes to their patients or service users (figure 10).

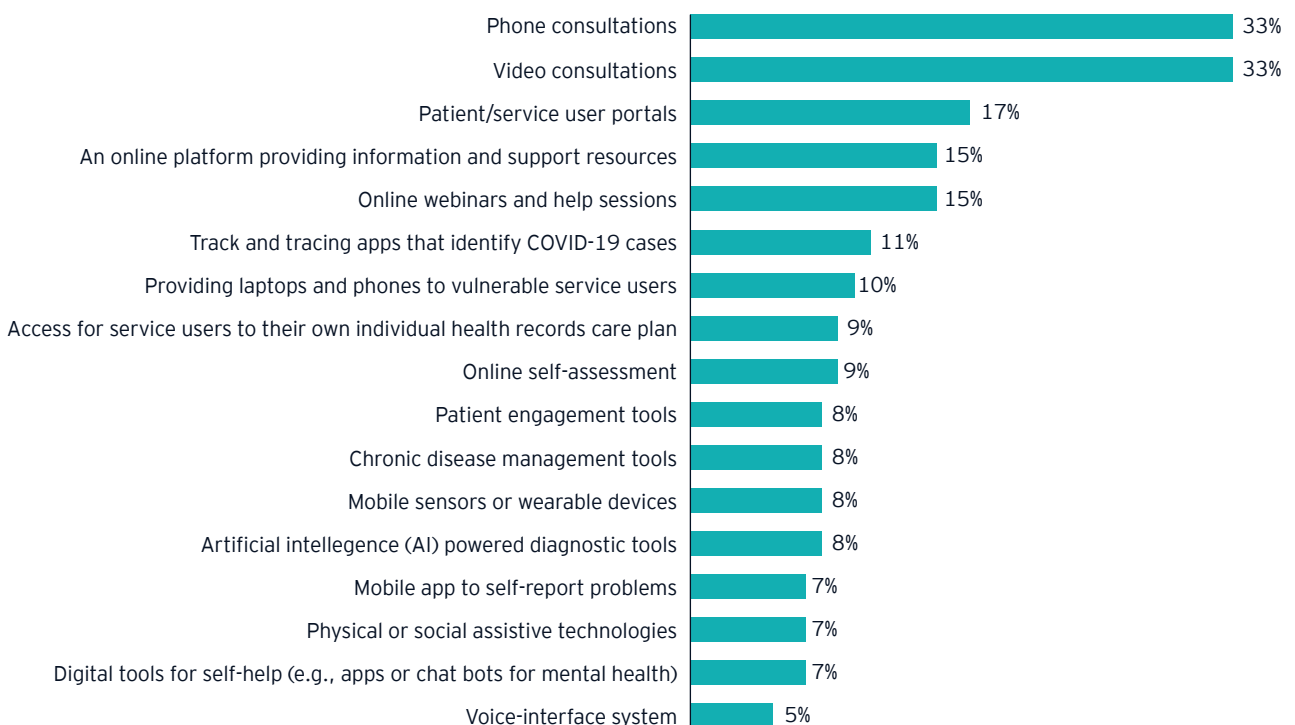
One third of respondents reported phone and video consultations among the most impactful tools. In a subsequent question, 58% of all respondents agreed that these solutions have proven to be effective substitutes for face-to-face consultations – with 73% of respondents from both India and the UAE, and 44% of respondents from the UK.

Other tools included patient and service user portals (17%), used for functions such as secure access to test results, appointment scheduling, text reminders and communication with care providers; online platforms (15%) providing a repository of information and support resources; and online webinars and help sessions (15%). These results were also fairly uniform across countries, with all countries, except the UAE, listing phone and video consultations as the top two most helpful solutions. Patient and service user portals topped the list of solutions for the UAE, with 23% of respondents using these digital solutions.



30% of respondents reported phone and video consultations as the most impactful tools.

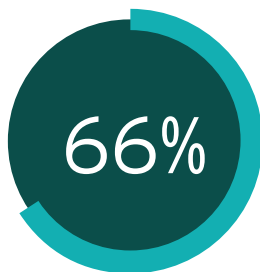
Figure 10. Which of the following digital technologies or data solutions has most helped your organization to deliver better and more efficient outcomes for patients and service users?*



Respondents across all sectors reported video consultations, phone consultations, and patient and service user portals among the top five most impactful digital solutions, as shown in figure 11. For mental health services, more than half of the respondents cited video consultations as a key tool. Mental health services respondents also reported online webinars and help sessions, and providing laptops and phones to vulnerable service users as top factors, while physical health services respondents cited track and trace apps for COVID-19 among the top five tools.

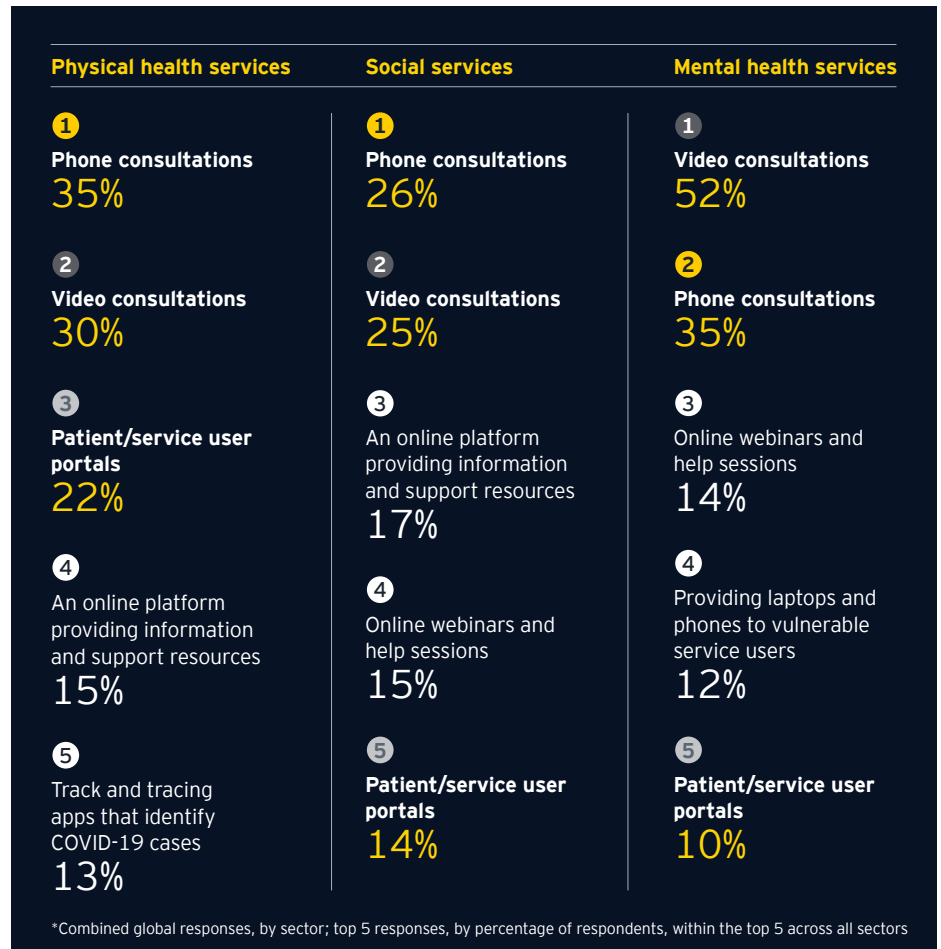
Reflections on the use of digital and data solutions by staff since the pandemic outbreak

As discussed throughout this report, the onset of the COVID-19 pandemic has drastically changed, in a matter of weeks, the way HHS organizations deliver their services. We asked respondents a series of questions



of respondents agreed their staff adapted to using new tools.

Figure 11. Which of the following digital technologies or data solutions has most helped your organization to deliver better and more efficient outcomes for patients and service users?*



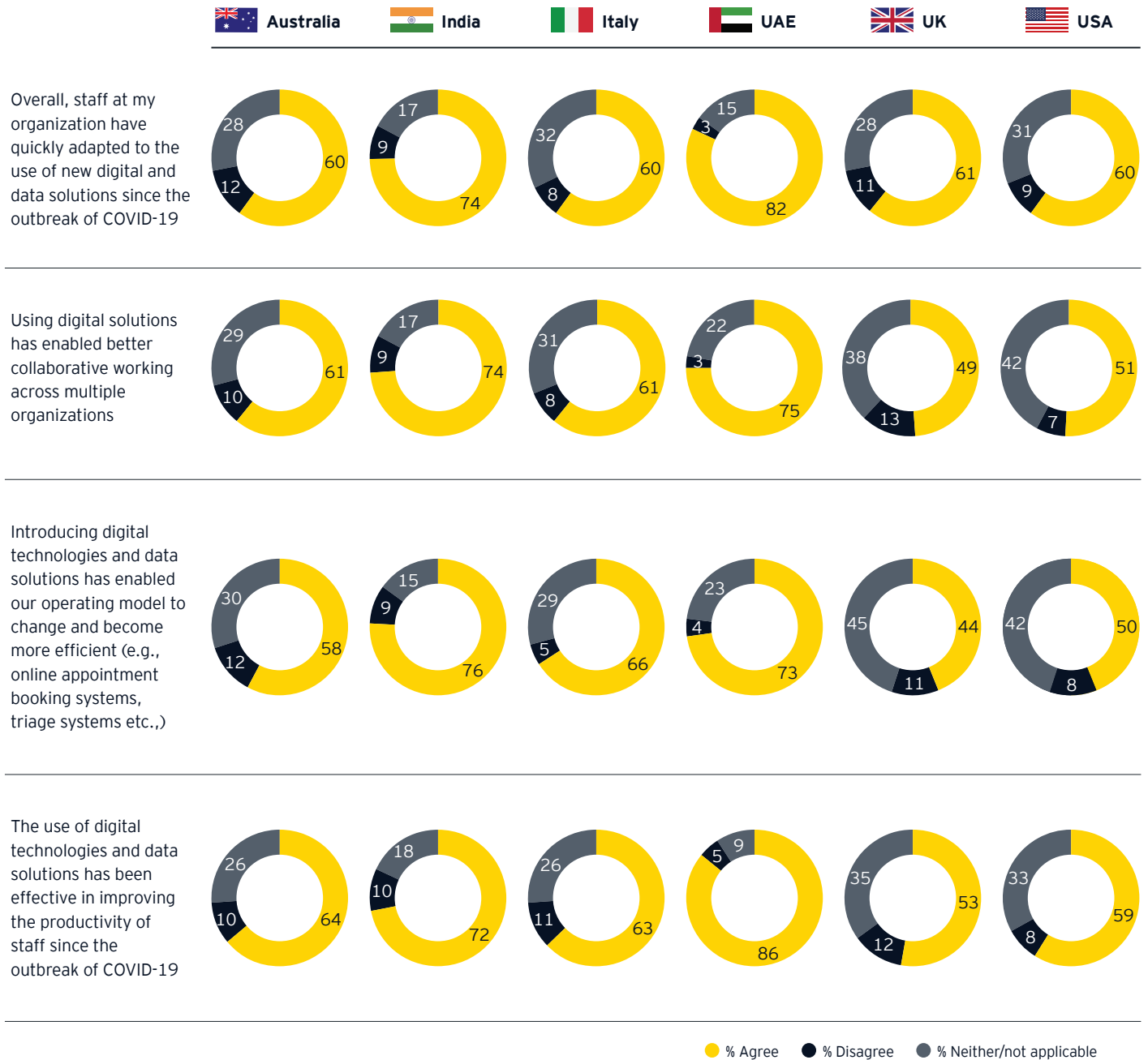
reflecting on the effectiveness of the use and implementation of digital solutions during the first six months of the pandemic, as shown in figure 12.

Overall, respondents mostly reported positive experiences with digital technologies and data solutions across a number of areas. 66% of global respondents agreed that their staff quickly adapted to using new tools, and 59% reported that digital solutions

have enabled better cross-organization collaboration. A further 58% reported that digital solutions have made operating models more efficient, and 63% agreed that staff productivity has improved because of them.

The UAE and India reported more positive experiences, again potentially due to the breadth of solutions employed throughout the pandemic. The UK, meanwhile, was the only country with

Figure 12. To what extent do you agree or disagree with each of the following statements?



Chapter 2

Developments throughout the COVID-19 outbreak

fewer than 50% of respondents agreeing that digital solutions have improved collaboration across organizations and enabled operating models to become more efficient.

Reflections on the use of digital and data solutions for service users

Despite the rapid speed of digital technology adoption and significant

disruption to pre-pandemic ways of working, most respondents report that the use of these solutions has also had a positive effect on access, experience, outcomes and staff productivity – as shown in figure 13.

A majority of respondents from five of the six countries surveyed (all but the UK) reported that digital technologies and data solutions have been effective in improving the quality of experience,

access to care, and outcomes for patients and service users. As shown in the figure above, the UAE and India had the most positive responses; 82% and 77% of respondents from the UAE and India, respectively, agreed that the use of these solutions has been effective in improving access to care, when and where people need it. While other countries had lower percentages of “effective” responses, it is worth noting that no more than

Figure 13. In your organization, to what extent do you think the use of digital technologies and data solutions has been effective in improving each of the following areas, since the outbreak of COVID-19?

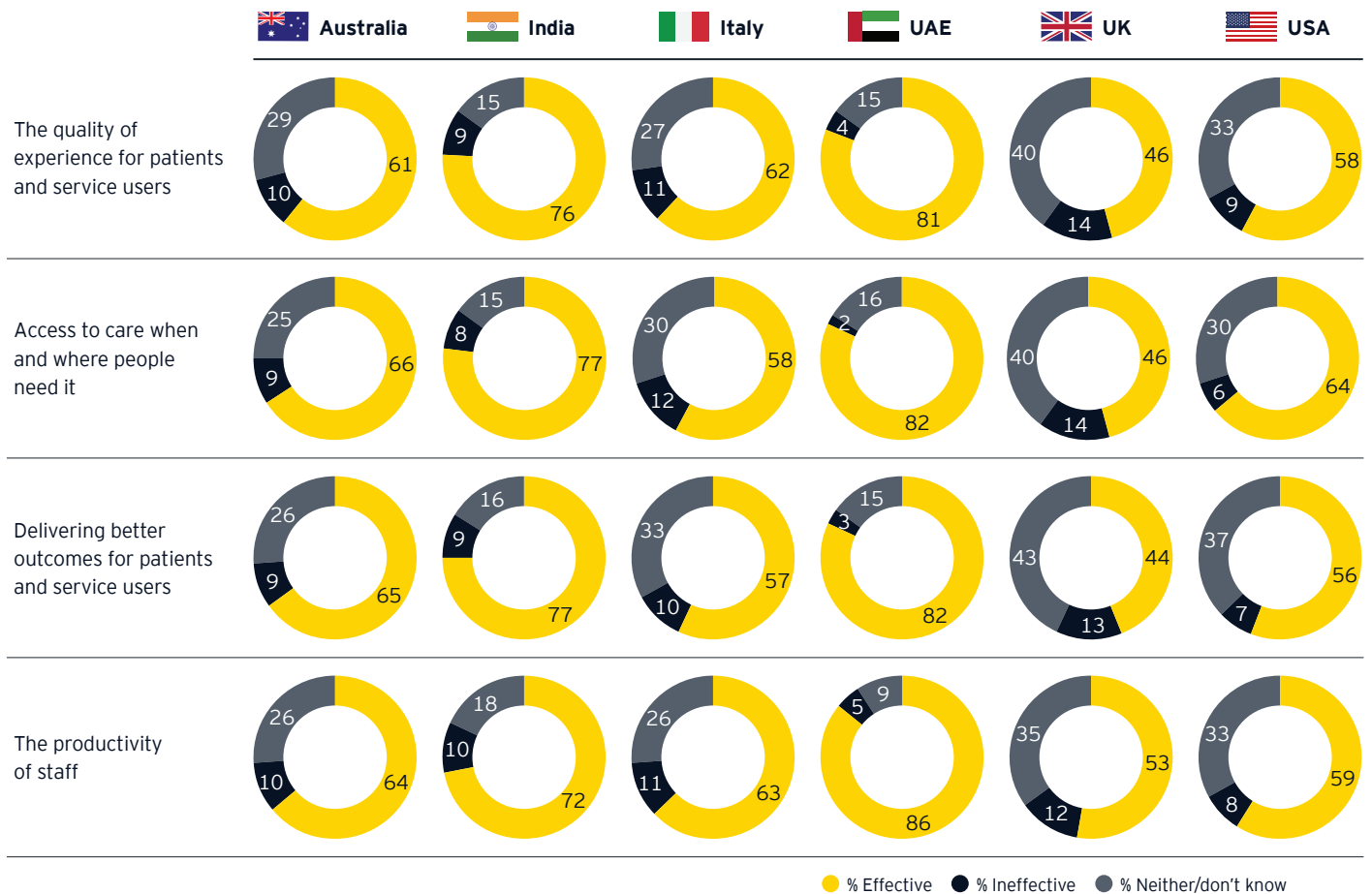
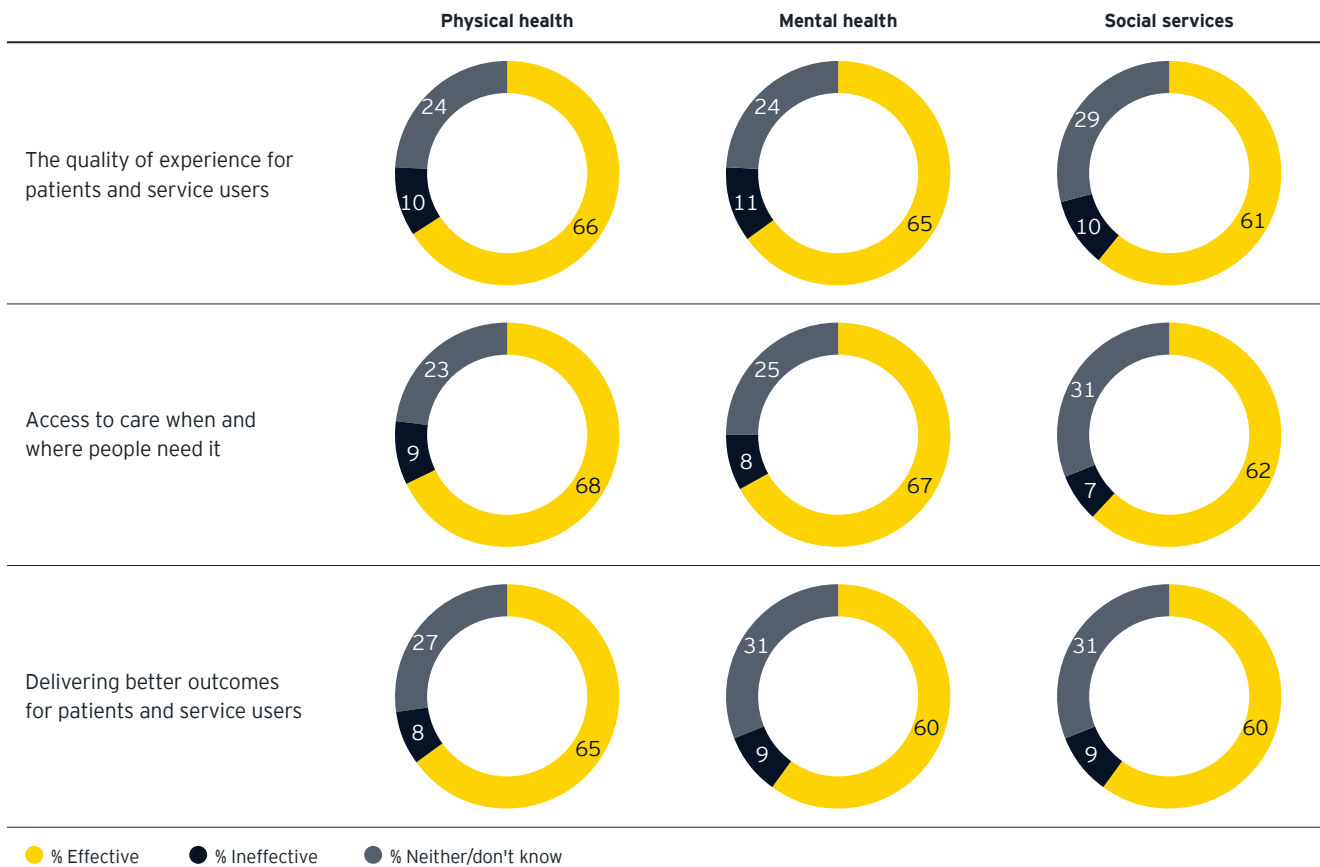


Figure 14. In your organization, to what extent do you think the use of digital technologies and data solutions has been effective in improving each of the following areas since the outbreak of COVID-19?



14% of respondents in any country found these tools to be ineffective in improving quality of experience, access, or outcomes for service users.

Responses were also fairly uniform across service sectors, though social service organizations had a lower percentage of respondents find these solutions to be effective in improving quality of experience, access and outcomes for service users. Physical

health services providers were also more likely to report that digital technologies and data solutions were effective in delivering better outcomes (65%), compared with mental health services and social services (both 60%).

However, it is important to note that figures 13 and 14 do not reflect on whether these areas have improved overall during the pandemic, but rather focus on the effect of digital

technologies and data solutions on these areas. There are concerns across industries about access to services for the vulnerable or those without internet (for example, in accessing online learning for students).²⁶ There is also evidence of delayed care services, which could affect quality and outcomes down the line (for example, delayed cancer screening resulting in a later stage diagnosis).²⁷ These and other factors may further exacerbate inequalities.



Implications for the future

As this report goes to press, there are a number of uncertainties regarding the trajectory of the pandemic and its effects on our daily lives. Yet, with no foolproof vaccine available and the second wave of infections arising or looming in many countries, it is clear that a return to “business as usual” is unlikely anytime soon. As such, organizations will likely continue to deploy new digital and data solutions and hone the use of those already implemented.

Future investment in digital technologies and data solutions

Almost half of the survey respondents (48%) reported planned investments in digital technologies and data solutions over the next three years (as shown in figure 15). This figure varied widely by country, with 75% of the respondents from India responding positively, compared with only 34% of the UK respondents.

However, a high proportion of respondents – ranging from 11% to 51% – were unsure of their organizations' intentions to invest in this area. This could reflect the uncertain nature of future budgets during the pandemic as well as the percentage of junior manager level respondents or those from very large organizations who may not have an insight into future budgetary decisions.

Results were fairly uniform across private, public, and non-profit, charity and volunteer sectors, with 47%–51% of respondents reporting planned investments. Mental health services, however, were less likely to report planned investments in these solutions, at 43%, compared with 49% and 53% for physical health services and social services, respectively.

Those planning to invest in this area, almost universally, reported an increase in investment compared with the previous three years (see figure 16), with 79% of the respondents reporting at least a 20% increase. This likely reflects a combination of factors, including increased demand for these services and, in some cases, underinvestment in the past.

Figure 15. Is your organization planning any investment in digital technologies and data solutions over the next three years?

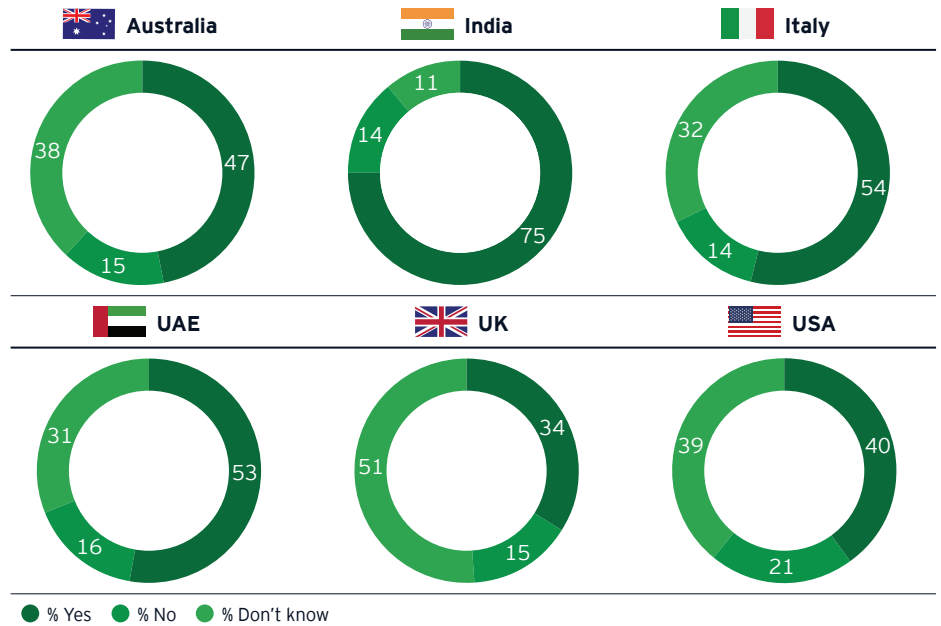
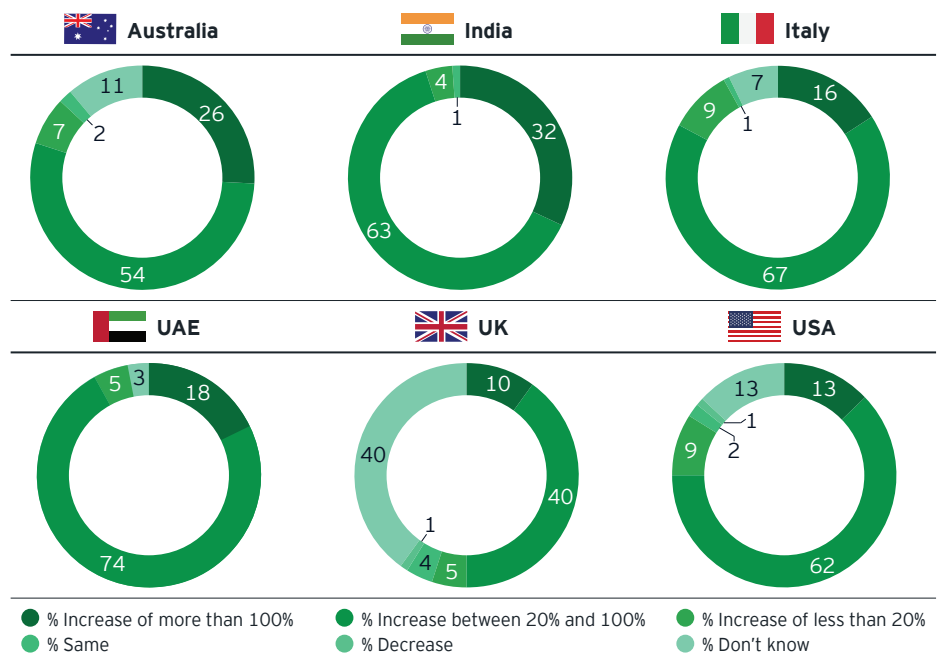


Figure 16. And, regarding investment in digital technologies and data solutions, what will be the level of investment compared with the previous three years?



Chapter 3

Implications for the future

Which solutions are likely to “stick” in the future, and why?

Despite the benefits outlined in the previous section and the projected continued investment in digital technologies and data solutions, a sizeable percentage of respondents – across countries, sectors and services – indicated that the introduction of these solutions was a temporary measure to address challenges during the pandemic period (as shown in figure 17).

These responses likely reflect the complexities involved in predicting the future use and interpreting the meaning

of the above question. As indicated by 30% of the respondents who neither agreed nor disagreed, there are a number of uncertainties regarding the continued use of these solutions after the pandemic. More junior or middle-level managers may also be unsure of future planned investments by their organizations. Changes in regulations, funding, user preferences, and provider views – explored in greater detail below – may affect the viability of these solutions in the long term. Further, some digital solutions that have temporarily replaced pre-COVID-19 methods of service delivery (for example, remote

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Around 50% of respondents plan investment in digital technologies and data solutions in the next three years.

Figure 17. Introducing digital technologies and data solutions was a temporary measure to help our organization get through the pandemic period.

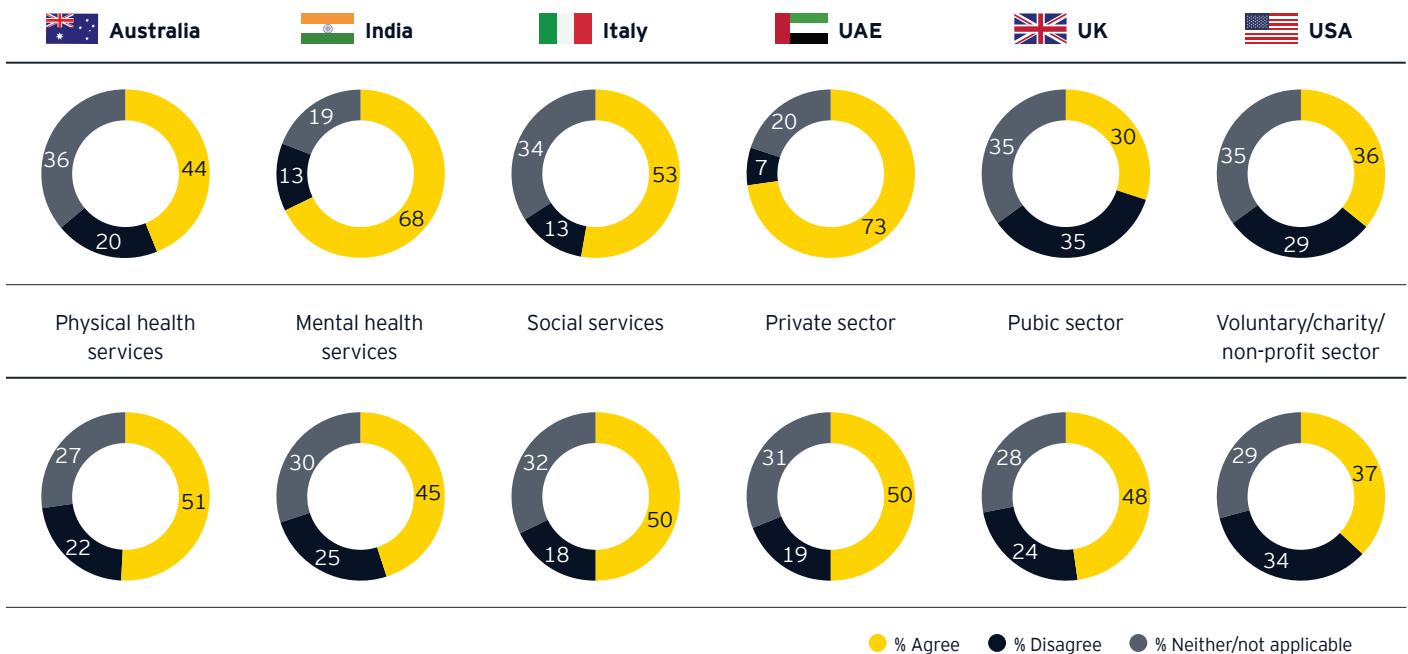
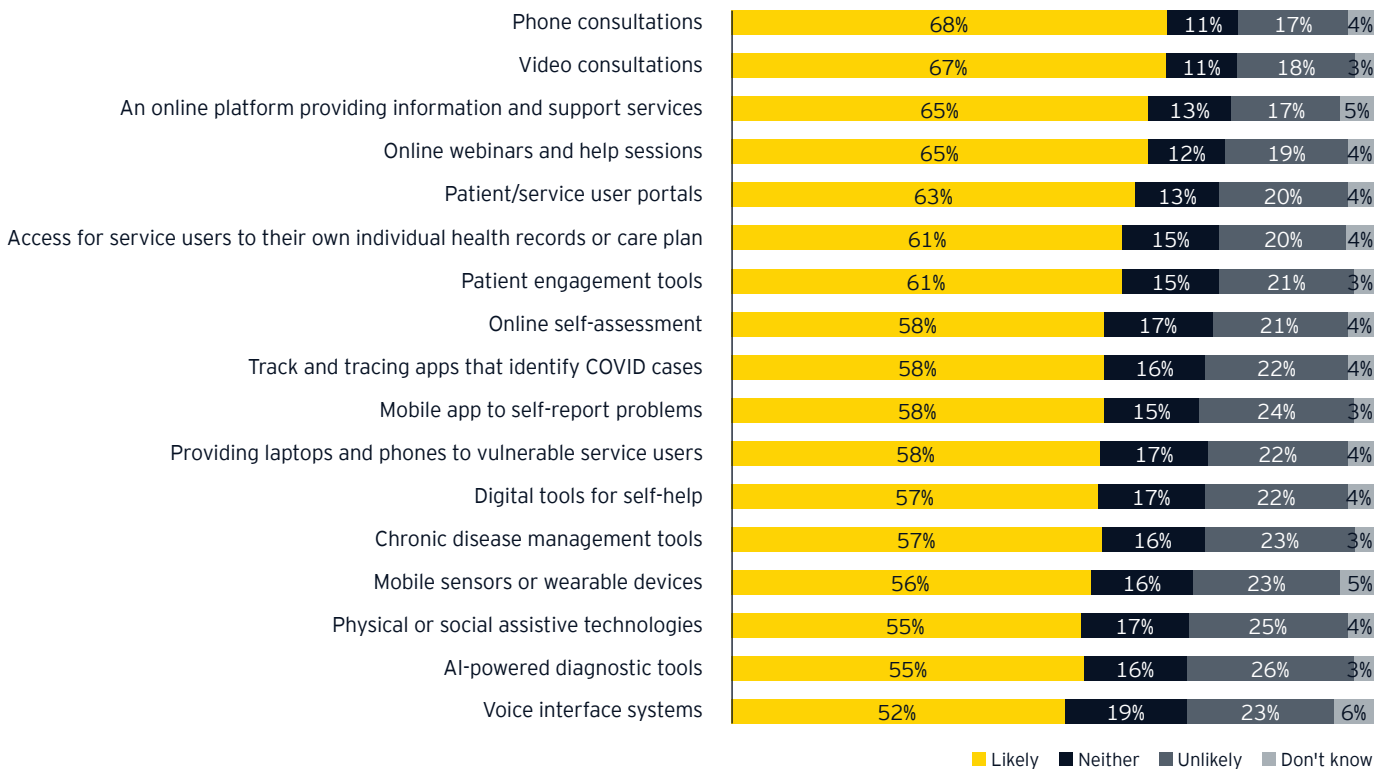


Figure 18. Over the next three years, how likely or unlikely is your organization to continue using these digital technologies and data solutions for patients or service users?*



or online education for children or in-person social care visits) will likely not be used as a primary means of delivery in the future. However, they may still be utilized alongside pre-COVID-19 services or for certain tasks or services; this nuance may not have been captured in the question.

As shown in figure 18, the majority of respondents indicated that their organizations are likely to continue using all of the patient- and service user-facing digital technologies and data solutions they have used during the pandemic. Phone and video consultations appear most likely to remain in use after the pandemic, across sectors and types

of organizations. In the US alone, for example, reimbursement for telemedicine visits will top US\$29b in 2020 – further normalizing this type of consultation for patients. However, it appears likely that the percentage of consultations done remotely will settle somewhere between pre-pandemic and pandemic levels, as more people feel comfortable and are able to return to in-person visits. Tools that give users direct access to self-help or care information are also likely to continue to proliferate, as also remote monitoring tools that will complement and support remote care.

These trends tended to hold across countries, with respondents from all

countries reporting that they are more likely than not to continue using all of the solutions employed throughout the pandemic over the next three years.

Similarly, the majority of the respondents indicated that they are likely to continue using all staff-facing digital technologies and data solutions, which were used during the pandemic. HHS organizations plan to continue to use tools that promote flexible or remote working as well as platforms that minimize the burden of administrative tasks (e.g., electronic referral or matching systems and appointment management apps or software to manage triaging). These tools support

Chapter 3

Implications for the future

the primary concerns around protecting staff and ensuring access to care, as well as underlining the benefits to staff productivity and collaboration, as identified above.

HHS organizations were able to overcome the barriers to implementation for many of the digital technology and data solutions implemented during the COVID-19 pandemic (see forthcoming report *Harnessing the power of data: Can reality catch up with ambition?* for a full overview of these barriers).

However, there are a number of related key factors, which will influence the continued use, widespread adoption, and sustainability of these solutions, as summarized below.

- ▶ **Funding and reimbursement:** Many organizations had access to emergency funding to introduce new digital or analytical solutions throughout the pandemic. Similarly, government funding and charitable donations have helped to provide service users with tools

required to access remote services (e.g., laptops, mobile phones and internet connections). HHS organizations may need to locate additional funding to continue using these tools in the future; yet the use of some of these solutions has also proven the financial business case for further investment through improved staff productivity and lower cost delivery models. Similarly, many services delivered virtually or through digital solutions have temporarily been approved for reimbursement during the pandemic. In the US, for instance, the Centers for Medicare and Medicaid Services (CMS) approved the reimbursement for 80 types of telehealth services temporarily in response to the pandemic. However, prior to the pandemic, only 20% of US states required equal payment levels for in-person and telemedicine services. Unless governments and payers adjust payment incentives to promote digitally-supported services and solutions, they will not be sustainable – even if they can deliver equivalent service quality at a lower cost.

- ▶ **Interoperability:** There are myriad solutions that address similar issues in HHS organizations, from different electronic medical records (EMRs) to distinct video-consultation providers, and they must often pull data from multiple other systems.





Interoperability is a major issue across this fragmented landscape, and this is often exacerbated when solutions are rapidly implemented without rigorous testing. Currently, many systems require intermediary solutions to allow disparate applications to communicate and share data. If information systems instead used common data standards and structures, integration would become seamless. Estonia, for instance, has a digital innovation platform that integrates all health and social care across the country – thereby eliminating interoperability issues. Unless organizations make a concerted effort to develop regional- or national-level strategies and infrastructures to support digital

solutions and data standardization, they will struggle to derive the full benefit of these tools and technologies.

- ▶ **Regulation and data security:** In response to the pandemic, many governments relaxed regulations for privacy and data protection to expedite the implementation of digital solutions. The UK, for instance, issued a temporary measure for care providers across sectors, who were required to share data for the purposes of responding to COVID-19. Unless regulators, providers and vendors can ensure that newly implemented tools and technologies can meet the necessary standards following the pandemic, some solutions may no longer be fit for purpose.

- ▶ **Provider adoption and buy-in:** Service providers must also see the benefits of continuing to use digital technologies and analytical solutions. In social care, for instance, some social workers have reported being able to spend more time with patients via remote consultations, accompanied by a reduced time spent traveling. For telehealth, many providers have expressed a desire to continue remote consultations, though this must be balanced with ensuring equity of access. To create buy-in among providers, solutions should also be user-friendly and incorporate seamlessly into existing workflows, rather than creating additional administrative burdens. At the Hong Kong Hospital Authority, for instance,

“

The actions of regulators, payers, service providers, vendors and service users will affect the future use of digital technology and analytical tools.

new digital tools are designed to be intuitive – requiring no training for staff to begin use. Tools that require significant staff training or “upskilling” to adapt to new ways of working may be more difficult to sustain long-term.

- ▶ **User adoption and demand:** HHS providers must consider the preferences and demands of their users. As pandemic restrictions continue, there is a possibility that users will become more accustomed to digital technologies and analytical solutions – thereby making them more acceptable and prevalent in the future. For instance, one survey found that 89% of patients who had used telehealth services were satisfied with this service. A recent multi-country survey of 12,000 citizens also found that 64% of respondents believed that technology would change health care services “a great deal” or “a fair amount” for the better, and that 52% of the respondents would be fairly or very likely to replace a routine doctor’s visit with a video call. Prior to the pandemic, many service users had expressed their concern around digital security, privacy, and the performance of digital tools, which could affect their acceptance in the future. Yet, this may be changing, particularly around attitudes toward data sharing for the public benefit. In the abovementioned multi-country survey, for instance,

52% of respondents supported public services and government departments using their personal data to help with disease prevention and tracking. Beyond these concerns, consumers ultimately opt for technologies, which are easy to use, and decrease wait time for services. Therefore, solutions that focus on speed and convenience are most likely to “stick” for the consumers. Yet, governments must also ensure that the benefits of digital technologies and data solutions reach across the population, particularly to vulnerable groups with limited digital access (e.g., rural populations, low-income groups and the elderly). Unless sufficient investments in infrastructure and training are made, countries risk increasing inequities in access to services.

The actions of regulators, payers, service providers, vendors and service users over the coming months will further affect the use of digital technology and analytical tools within HHS organizations across the world. It is imperative that these parties work together to maximize the potential benefits of these solutions to deliver improved services to all citizens.

Acknowledgments

This policy report was written by **Didi Thompson**, an independent health policy consultant and Honorary Research Fellow at the Institute of Global Health Innovation (IGHI) at Imperial College London. It was produced by IGHI at Imperial College London. It has benefited from the financial sponsorship of EY and from the support of various EY experts across the world. IGHI would like to extend their sincere gratitude to all the EY individuals who have helped complete this study. We would like to particularly thank **Mr. George Atalla** and **Ms. Julie McQueen** from EY for their immense and steady support for the project.

We would like to thank the following individuals for contributing their time and expertise to this report:

Dr. David Bates

Brigham and Women's Hospital

Dr. Anita Chandra

RAND Corporation

Sheryl Coughlin

EY

Gianluca Fontana

Institute of Global Health Innovation,
Imperial College London

Marten Kaevats

Government of Estonia

Melanie Leis

Institute of Global Health Innovation,
Imperial College London

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Top End Health Service, Department of
Health, Northern Territory, Australia

Egbert Schillings

Babylon Health

Wajid Shafiq

Xantura Limited

Dr. Karen Stringer

Top End Health Service, Department of
Health, Northern Territory, Australia

Dr. NT Cheung

Hospital Authority, Hong Kong

Appendix: Survey overview and methodology

We collaborated with YouGov to administer a survey to a subset of their YouGov Plc UK panel of 800,000+ individuals who have agreed to take part in surveys. Fieldwork was undertaken between 3 September 2020 and 29 September 2020, with respondents completing the survey online. The total sample size was 2,243 health and

social care managers globally, spread across six countries: Australia, India, Italy, UAE, the UK and the US. Further details of the sample are included in the figures 1 and 2 below.

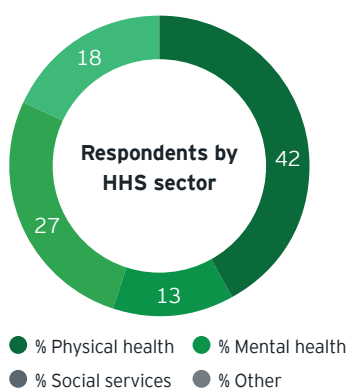
All respondents work in HHS organizations and were asked to identify the area in which they work.

Those in the “physical health” category (as shown in Figure 1) included acute care, primary care, disease management and specialist care. Those in the “mental health” category specified that they work in mental health. “Social services” included respondents from the following services: addiction; aged care; children and family support; child protective services; child-care or fostering and adoption; housing and assistance for the homeless; physical or sensory disability; learning disability; criminal justice; and education. 18% of respondents specified that they worked in another setting that did not fit these categories or crossed categories, with open responses ranging from research to holistic care.

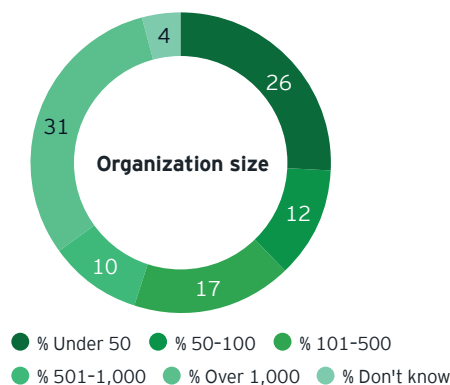
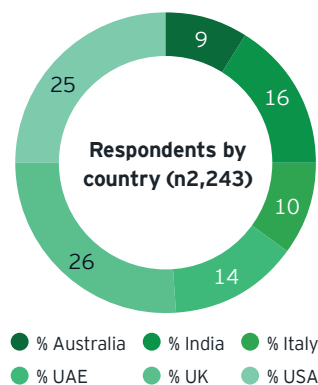
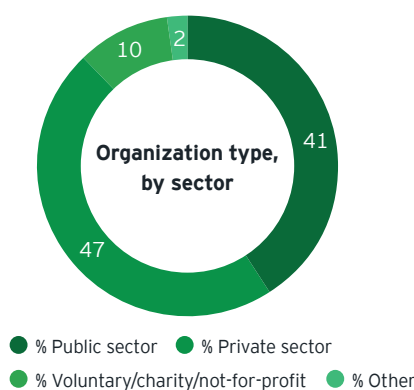
All respondents serve in management-level roles and above, ranging from junior and middle managers (48%) to owner or proprietors (15%) to chief executives (5%).

The survey comprised a series of questions spanning: demographics of respondents and their organizations; challenges experienced during the pandemic; use of digital technologies and data solutions; effects of digital technology and data solution implementation; and future plans around investment in, and use of, these tools.

Characteristics of survey respondents, by country and HHS sector



Characteristics of survey respondents, by organization type and size





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