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

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

The better the question.
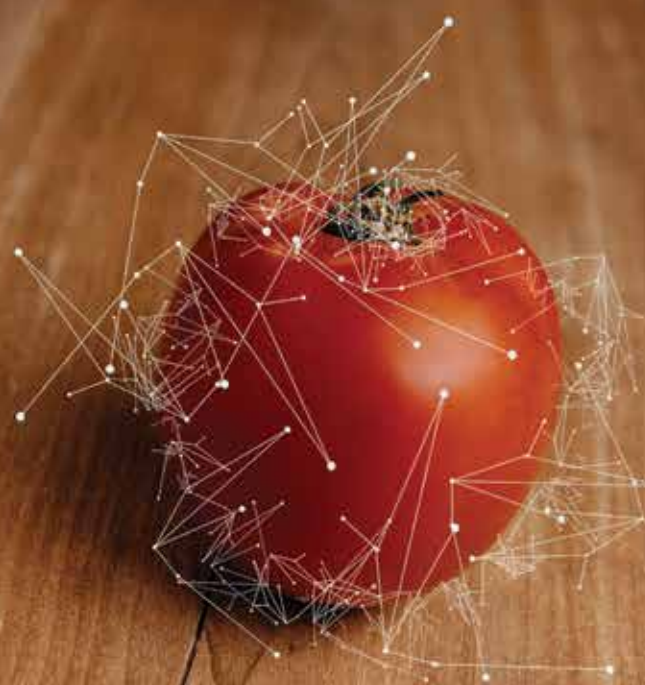The better the answer.
The better the world works.

Imperial College London

INSTITUTE OF GLOBAL HEALTH INNOVATION

EY
Building a better working world

TOMATO
Solanum lycopersicum

AVG. 123 grams - 22 kcal

Nutrition Facts: Tomatoes, red, ripe, raw - 100 grams

Calories	18
Water	95 %
Protein	0.9 g
Carbs	3.9 g
Sugar	2.6 g
Fiber	1.2 g
Fat	0.2 g
Saturated	0.03 g
Monounsaturated	0.03 g
Polyunsaturated	0.08 g
Omega-3	0 g
Omega-6	0.08 g

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Foreword

Gaurav Taneja
Partner and Leader, Government
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EY partnered with Imperial College London's Institute of Global Health Innovation (IGHI) and YouGov, to undertake a research into the use of digital technologies and data solutions in the Health and Social Sector (HSS) landscape. The research aims to understand how HSS providers have used digital solutions during the COVID-19 crisis and how they anticipate service delivery altering in the future. The objective of the study was also to gain insights on how several HHS providers have unlocked the power of digital to redesign services and delivered effective and focused solutions, which led to better health outcomes for citizens and patients.

The report is based on a YouGov survey with responses from 2,243 health and human services professionals in 6 countries – India, Australia, Italy, UAE, UK, US. The number of respondents in India was 359.

The findings reveal that the pandemic has accelerated the adoption of digital solutions and brought about a substantial shift in the attitudes of HSS professionals with respect to using technology in their everyday work. Interestingly, India has witnessed one of the highest adoptions of digital technologies by HSS organizations among the countries surveyed.

51% of HSS organizations (including public, private and voluntary/non-profit) in India increased their use of digital during the pandemic. Encouragingly, nearly 3/4th 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.

Organizations continue to face several challenges such as maintaining safety and wellbeing of staff, maintaining access to care and managing workforce capacity while they respond to the ongoing COVID-19 crisis. Privacy concerns, ethical concerns about using digital technology and loss of human interaction are some of the major barriers preventing rapid adoption of technologies.

A clear majority (75%) of respondents from India indicated that they plan to further invest in digital solutions and technologies over the next 3 years and that the level of investment will be more than 50% as compared to the previous 3 years. This shows a clear preference of providers across sectors (public, private, voluntary/non-profit) and service types (physical health, mental health and social services) for digital even after the immediate crisis ends and conditions normalize.

The vital question now is, are we prepared to address the key pre-COVID and post-COVID barriers highlighted in the survey? Some of the pre-COVID barriers include the ability to protect an individual's identity and personal information, ethical concerns about the use of technology, while post-COVID barriers include lack of adequate financial resources to acquire needed tools, technologies and equipment. Will we continue with the top enablers for digital adoption during the COVID period such as rapid development of strategic plan for digital adoption and improving service users' proficiency to use the tools?

Along with these findings, we have also tried to map some practical solutions for 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.

Executive summary and key messages

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 HSS organizations provide their services. This paper presents an overview of the insights gleaned from a multi-country survey, including India, and series of expert interviews on how HSS 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 concerns include the inability to meet the demand for the required services, lack of adequate workforce capacity, and delays in responding to policy and regulatory changes. Though the current service delivery climate remains difficult, digital technologies and data solutions have helped address many of the industry's top challenges.

Uptake of digital technologies and data solutions incresed by 50% during the pandemic

Prior to the pandemic, HSS 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, 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; and mental health services are more or less equal to physical health and social 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 HSS organizations (up from 39% before the pandemic) and video consultations available from 71% of organizations (up from 22% before the pandemic). Compared to this, the uptake has been higher in India at 86% for phone consultation (up from 48% before pandemic) and at 83% for video consultations (up from 33% before 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 HSS providers. However, greater provider and user familiarity with these solutions may lead to their continued use in the future.

Unprecedented sense of urgency enabled HSS organizations to overcome implementation barriers

A number of barriers, specific to HSS, have prevented the widespread adoption of digital technologies and analytical solutions in this sector. Prior to the pandemic, some of the practitioner concerns which were most prevalent among respondents from India, include:

▸ Legal objections by Indian Medical Association to prevent practitioners licensed in one state from advising patients in another state

▸ Ability to protect an individual's identity and personal information

▸ Ethical concerns about the use of technology and loss of interactions with service users

About 55% of the respondents from India cited the aforesaid points as barriers to implementation. Lack of access to adequate financial resources and lack of expertise to select the right technology solution for the organization were listed as top barriers by 31% of the respondents. Other issues, practitioners concerns about reliance on data insights over professional judgement, difficulty in adapting existing IT systems, and inadequate staff digital literacy were also among the top concerns of respondents.

The extraordinary circumstances amid the pandemic have helped HSS 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, rapid development of strategic plan for digital adoption, ability to protect an individuals's identity and personal information and improvement in service users' proficiency to use the tools were top enablers for greater adoption of these solutions in India as against alleviation of practitioner concerns, rapid leadership buy-in and strategic plan adoption, and improvements in digital literacy listed as the top enablers fo overall sample. 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 several positive effects.

74% of respondents in India reported that digital technologies and data solutions have increased the productivity of staff compared to 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, around 78% of respondents from India agreed that use digital solutions have been effective in ensuring access to care when and where people need it and 75% reported that digital solutions have been effective in delivering better outcomes for patients and service users.

However, it is important to note that despite the positive effects of these solutions, there are concerns about access to HSS 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 HSS delivery.

Approximately half of the 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%).

Most 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 around 30% of the respondents, there are a number of uncertainties regarding the continued use of these solutions after the pandemic.

Executive summary and key messages

Although HSS 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 HSS, 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 HSS 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 higher uptake of solutions, compared with physical health or social services

Mental health respondents across sample countries 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 social 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 social services, respectively). In India, none of the mental health respondent reported lack of plan to implement digital technology and data solutions prior to the pandemic compared with 10% for reporting so for physical health and 7% for social sector. Digital technology and data solutions were rather better embedded in the way

they were working for mental health (19%) than those of physical health (18%) and social services (18%).

Mental health services organizations in our sample were also more likely to have implemented the digital tools during the pandemic – with the exception of video consultations in India– compared with physical health and social services providers.

Regarding the future, mental health services are more likely to report planned investments in AI-powered diagnostic solutions over the next three years in India, at 81%, compared with 77% and 76% for physical health services and social services, respectively. However, approximately one third of respondents from all sectors were unsure of future investment plans.

India along with UAE report the greatest use of digital technology and data solutions

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.

Looking to the future, India (75%), Italy (54%) and the UAE (53%) had a clear majority of respondents indicate that 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 HSS 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 HSS provisions across countries; these factors can affect not only baseline responses, but also the barriers and enablers to the uptake of digital and data solutions. 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 social services (HSS) organizations have largely struggled to implement digital and analytical solutions at scale.[1] However, with the onset of the COVID-19 pandemic in early 2020, HSS organizations have rapidly deployed digital and data solutions to deliver remote services and support users and staff in new ways.

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 HSS 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 HSS 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.
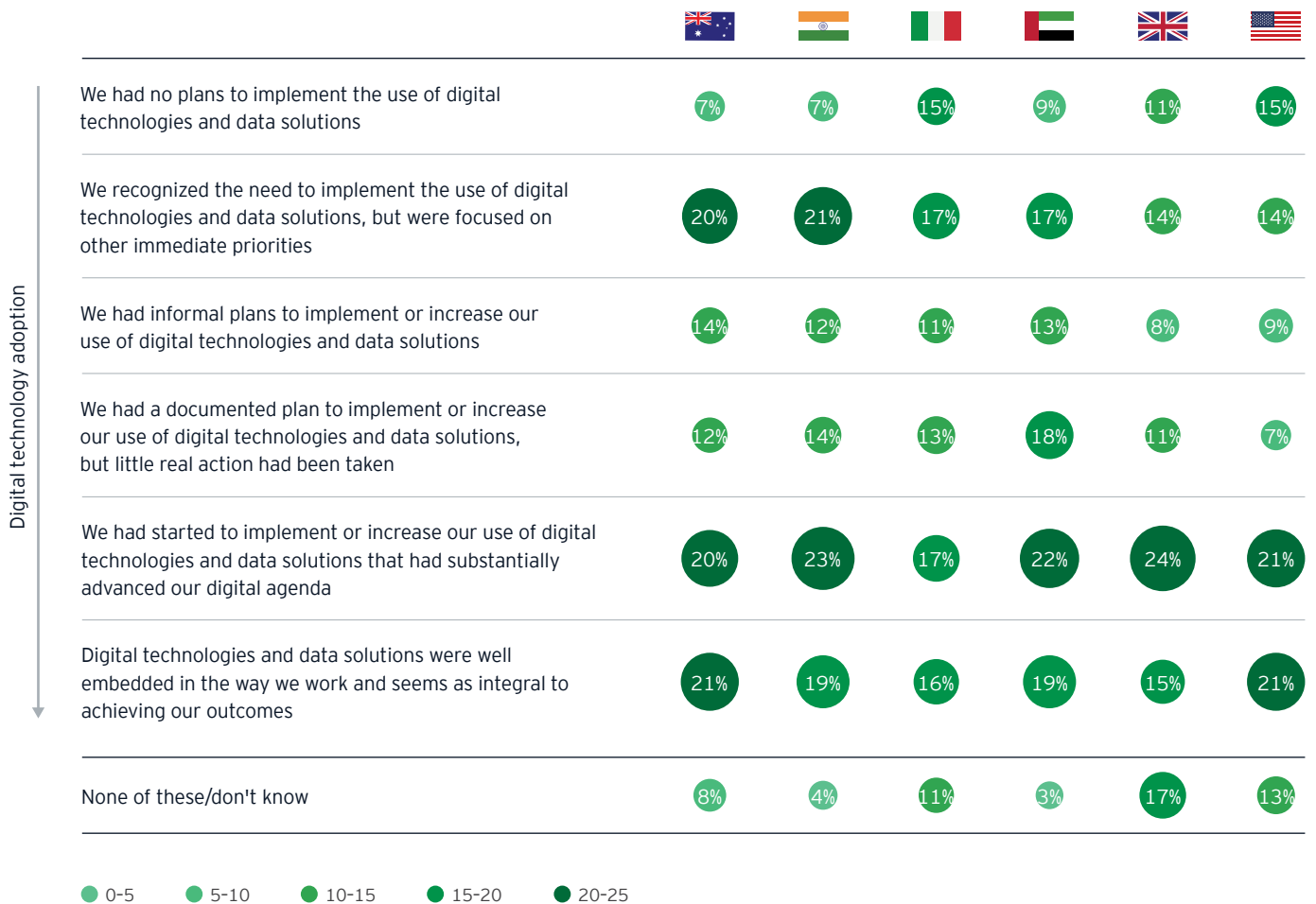
Early responses to the COVID-19 pandemic

This section outlines the baseline levels of digital technology and data solution adoption of HSS 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, 19% of HSS organizations had successfully embedded digital technology and data solutions in the way they work and 23 % of HSS organisations had started to implement or increase the use of digital technologies and solutions that had substantially advanced their digital agenda. 7% of HSS organizations had no plans to implement these solutions. 19% mental health respondents reported that use of digital technology and data solutions were well embedded in the way they work compared to 18% for physical health and social services.

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

Digital technology adoption	Australia	India	Italy	UAE	UK	USA
We had no plans to implement the use of digital technologies and data solutions	7%	7%	15%	9%	11%	15%
We recognized the need to implement the use of digital technologies and data solutions, but were focused on other immediate priorities	20%	21%	17%	17%	14%	14%
We had informal plans to implement or increase our use of digital technologies and data solutions	14%	12%	11%	13%	8%	9%
We had a documented plan to implement or increase our use of digital technologies and data solutions, but little real action had been taken	12%	14%	13%	18%	11%	7%
We had started to implement or increase our use of digital technologies and data solutions that had substantially advanced our digital agenda	20%	23%	17%	22%	24%	21%
Digital technologies and data solutions were well embedded in the way we work and seems as integral to achieving our outcomes	21%	19%	16%	19%	15%	21%
None of these/don't know	8%	4%	11%	3%	17%	13%

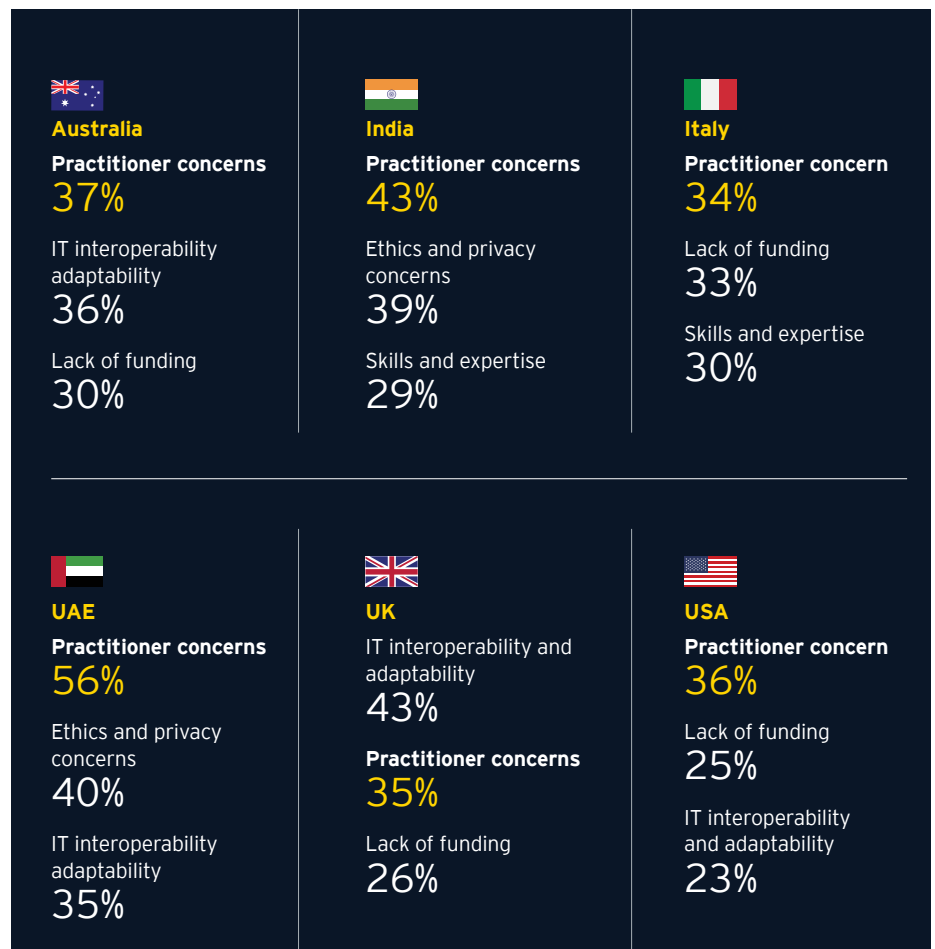● 0-5   ● 5-10   ● 10-15   ● 15-20   ● 20-25

Chapter 1:
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?* – HSS 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 – ability to protect an individual's identity and personal information, ethical concerns about the use of technology and loss of interactions with service users – were most prevalent among our respondents, with 55% citing this as a barrier to implementation. Lack of access to adequate financial resources and lack of expertise to select the right technology solution for the organization were listed as top barriers by 31% of the respondents. Other issues include, practitioners concerns about reliance on data insights over professional, difficulty in adapting existing IT systems, and inadequate staff digital literacy were also among the top concerns of respondents.

While ability to protect an individual's identity and personal information and ethical concerns about the use of technology were reported among the top five barriers across HSS sectors, lack of access to adequate financial resources to acquire needed tools, technologies and equipments, lack of expertise to select right technology

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?*

Australia
Practitioner concerns
37%

IT interoperability adaptability
36%

Lack of funding
30%

India
Practitioner concerns
43%

Ethics and privacy concerns
39%

Skills and expertise
29%

Italy
Practitioner concern
34%

Lack of funding
33%

Skills and expertise
30%

UAE
Practitioner concerns
56%

Ethics and privacy concerns
40%

IT interoperability adaptability
35%

UK
IT interoperability and adaptability
43%

Practitioner concerns
35%

Lack of funding
26%

USA
Practitioner concern
36%

Lack of funding
25%

IT interoperability and adaptability
23%

solutions for the organization and difficulty in adapting existing IT systems also figured in top five for the public sector.

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 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.[2] Social distancing, infection control and lockdown measures have disrupted the daily lives of billions of people.

HSS 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 understanding growing or changing needs of patients/service usersare also among the top challenges.

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?*

	Australia	India	Italy	UAE	UK	USA
Maintaining the safety and well-being of our staff	17%	16%	23%	12%	15%	15%
Maintaining access to care due to restrictions (e.g., inability to conduct face to face consultations)	13%	9%	10%	8%	17%	10%
Ability to continue services and care due to workforce capacity		7%	9%		12%	
Loss of demand for our services (e.g., patients unwilling to attend in-person appointments)	10%	7%		8%		13%
Operating within our budget		8%		6%		
Meeting demand for services			10%		9%	18%
Understanding growing or changing needs of patients/service users			8%			
Increased strain on providers						8%
Responding quickly to policy and regulatory changes	6%			8%	8%	
Technological access for vulnerable families and children	6%					

● 0-5　　● 5-10　　● 10-15　　● 15-20　　● 20-25

# Chapter 1:
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 HSS 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).[3]

Due to concerns for the safety and welfare of citizens and staff, as well as lockdown or movement restrictions, 51% of respondents in India have increased their use of digital technologies and data solutions since the outbreak of the pandemic. This proportion increases to
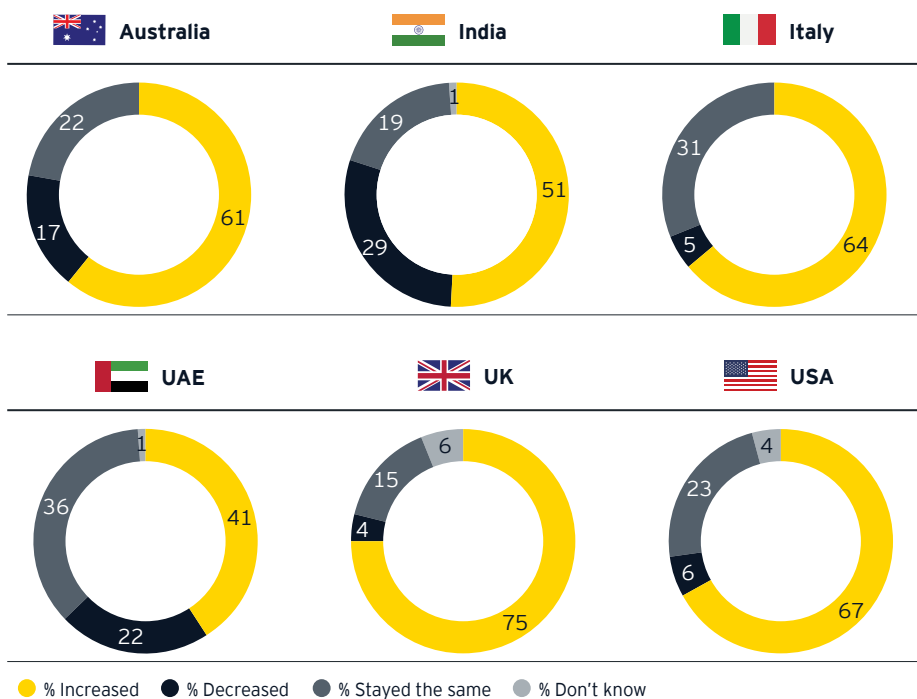
57% for respondents from mental health services (compared with 48% for both physical health and social services), providing an encouraging picture of how HSS organizations have pivoted to meet service demands, amid a challenging environment.

Interestingly, however, 29% for HSS organizations from India indicated that they decreased their use of these solutions,. 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, some

51%
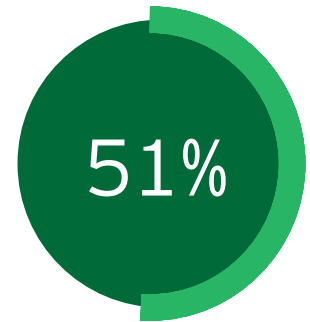
of respondents in India have increased their use of digital technologies

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

Australia
- 61
- 17
- 22

India
- 51
- 1
- 19
- 29

Italy
- 64
- 5
- 31

UAE
- 41
- 1
- 36
- 22

UK
- 75
- 4
- 15
- 6

USA
- 67
- 6
- 23
- 4

● % Increased   ● % Decreased   ● % Stayed the same   ● % Don't know

HSS 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 HSS 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. For example, Ministry of Health and Family Welfare, Government of India issued a set of guidelines for telemedicine during lockdown. 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 appropriate.[4] ¨ 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 options. (reference no. 3)

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 pandemic.[5] Meanwhile, HSS 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, 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 HSS staff and service users have also been forced to adapt quickly due to the above mentioned changes in care delivery.

Within our survey, rapid development of a strategic plan for digital adoption, ability to protect an individual's identity and personal information and improvement in service users' proficiency to use the tools were listed as the top enablers for greater adoption of these solutions by respondents from India. Yet, other factors including alleviation of practitioner concerns, increased demand from service users for digital tools and services and availability of expertise to select the right technology solution for the organization were also common responses.

Key factors 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 HSS sectors. Other key enablers largely mirrored the key barriers to adoption, prior to the onset of the pandemic. India and the UAE , for instance, identified ethical and privacy concerns among the top three barriers and the alleviation of these concerns also figured among the top three enablers. Increased demand from service users for digital tools and services was top enabler for public sector respondents in India whereas improvement in service users' proficiency was top enabler for private sector respondents.

Chapter 1:
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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?*

Australia
Rapid senior leadership buy-in or strategic plan adoption
26%

Improvements in digital literacy of staff or service users
26%

Alleviation of practitioner concerns
23%

India
Alleviation of practitioner concerns
38%

Alleviation of ethical and privacy concerns
29%

Improvements in digital literacy of staff or service users
27%

Italy
Alleviation of practitioner concerns
30%

Improvements in digital literacy of staff or service users
24%

Availability of funding and reimbursement
24%

UAE
Alleviation of practitioner concerns
41%

Improvements in digital literacy of staff or service users
35%

Alleviation of ethical and privacy concerns
34%

UK**
Rapid senior leadership buy-in or strategic plan adoption
26%

Availability of funding and reimbursement
18%

Improvements in IT interoperability or adaptability
17%

USA
Improvements in digital literacy of staff or service users
24%

Rapid senior leadership buy-in or strategic plan adoption
21%

Alleviation of practitioner concerns
21%

*Combined global responses, by country; top 3 responses, by percentage of respondents
**"Don't know" selected by 20% of respondents but excluded from this list
Within the top 3 across at least 5 out of 6 countries

Types of solutions and technologies

HSS 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. For example, India has recorded a 3X increase in the number of people using online consultations, while in-person appointments have reduced by 32 percent in between March to November 2020**. In Canada, 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.[6]

Other HSS 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 visits.[7]

Many countries have also developed and implemented digital and data solutions to directly address the COVID-19 pandemic. Many countries also launched test and trace apps to identify potential new cases and curb the spread of the outbreak. In India, for instance, Government launched Aarogya Setu application using Bluetooth signals to track and record when individuals are in proximity to each other and immediately informs an invidual if any of her contacts tests positive for COVID-19 and arranges proactive medical intervention*. Singapore also used a mobile phone application that uses Bluetooth signals for the Ministry of Health to access the data to identify contacts of the infected person.[8] 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. An EY Team, for example, helped Government of Andra Pradesh in India to set up COVID Comand and Control Center to monitor various services and resources during early months of pandemic. South Australia's Vulnerable Persons' Board 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.
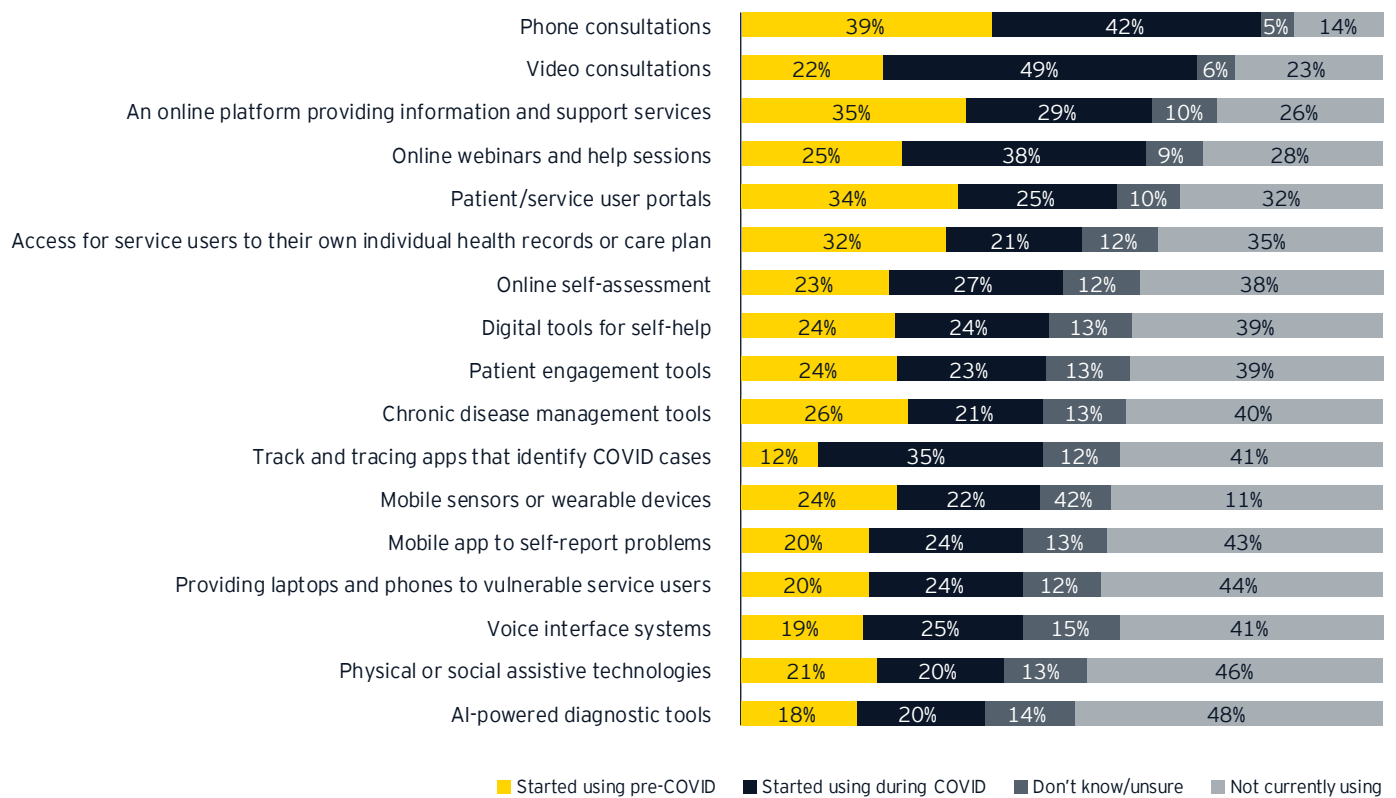
Other common digital and data solutions include patient-facing tools, such as service-portals, self-assessment, and patient engagement tools. Many governments are using digital information portals, AI chatbots, mobile apps and social media platforms to directly connect with people and ensure that they're 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.[9, 10]

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

Chapter 1:
Early responses to the COVID-19 pandemic

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

Technology	Started using pre-COVID	Started using during COVID	Don't know/unsure	Not currently using
Phone consultations	39%	42%	5%	14%
Video consultations	22%	49%	6%	23%
An online platform providing information and support services	35%	29%	10%	26%
Online webinars and help sessions	25%	38%	9%	28%
Patient/service user portals	34%	25%	10%	32%
Access for service users to their own individual health records or care plan	32%	21%	12%	35%
Online self-assessment	23%	27%	12%	38%
Digital tools for self-help	24%	24%	13%	39%
Patient engagement tools	24%	23%	13%	39%
Chronic disease management tools	26%	21%	13%	40%
Track and tracing apps that identify COVID cases	12%	35%	12%	41%
Mobile sensors or wearable devices	24%	22%	42%	11%
Mobile app to self-report problems	20%	24%	13%	43%
Providing laptops and phones to vulnerable service users	20%	24%	12%	44%
Voice interface systems	19%	25%	15%	41%
Physical or social assistive technologies	21%	20%	13%	46%
AI-powered diagnostic tools	18%	20%	14%	48%

■ Started using pre-COVID   ■ Started using during COVID   ■ Don't know/unsure   ■ Not currently using
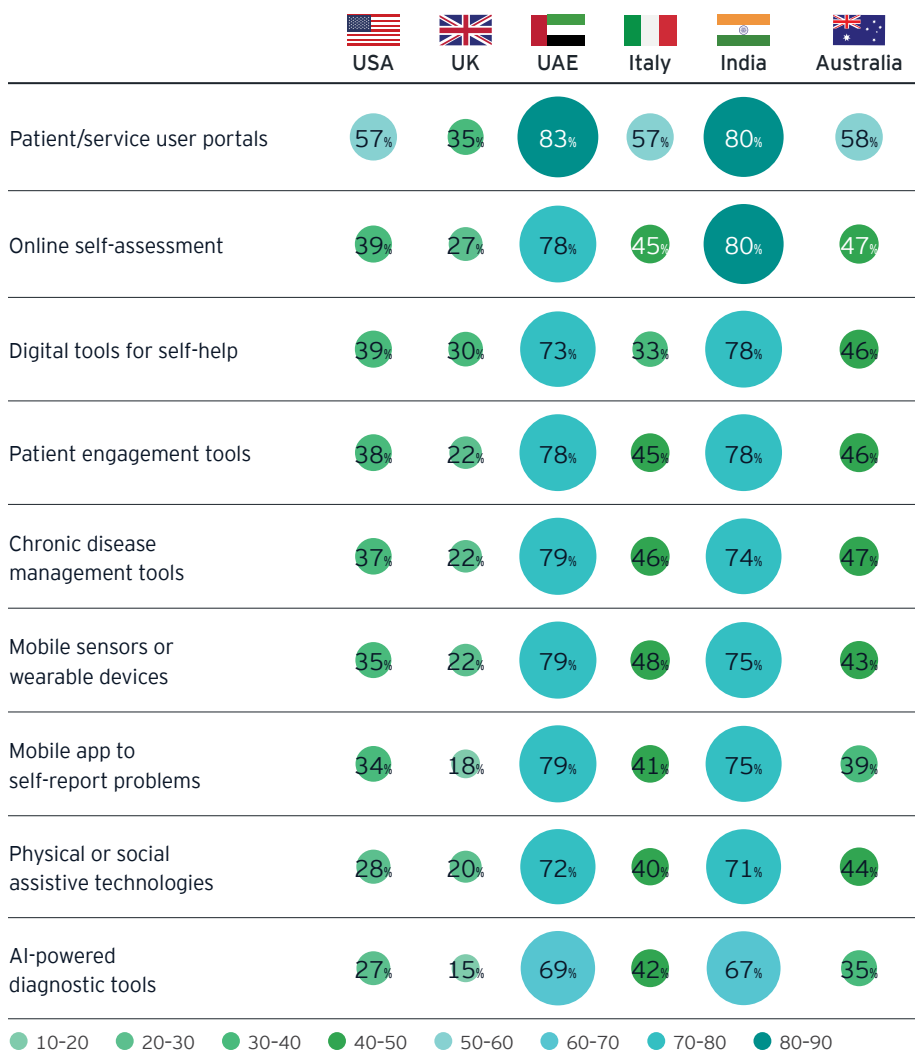
Phone and video consultations have seen the greatest uptake within our sample, with phone consultations being offered by 81% of HSS organizations (up from 39% before the pandemic) and video consultations available from 71% of organizations (up from 22% before the pandemic). In India, Phone and video consultations have seen highest with phone consultations available from 86% of organizations and video consultations available from 83% organisations. Only UAE among the sample countries was ahead of India in terms of phone consultations which

were available from 88% organisations. Despite this, public sector organisations in India preferred digital tools for self-help (92% organisations) and online self-assessment tools (89% organisations) over phone consultation (86% organisations) and video consultaion (83% organisations). Preference for phone calling over video calling may be due to the reason that many users of Government health facilities in India are not tech-savvy, and prefer talking on the phone instead. 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. In India, they are comparatively less preferred at 41%. While the uptake of these tools was hastened by the need to limit in-person contact through remote services, greater provider and user familiarity 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 HSS providers may be able to leverage to better target service users needing intervention.

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

	USA	UK	UAE	Italy	India	Australia
Patient/service user portals	57%	35%	83%	57%	80%	58%
Online self-assessment	39%	27%	78%	45%	80%	47%
Digital tools for self-help	39%	30%	73%	33%	78%	46%
Patient engagement tools	38%	22%	78%	45%	78%	46%
Chronic disease management tools	37%	22%	79%	46%	74%	47%
Mobile sensors or wearable devices	35%	22%	79%	48%	75%	43%
Mobile app to self-report problems	34%	18%	79%	41%	75%	39%
Physical or social assistive technologies	28%	20%	72%	40%	71%	44%
AI-powered diagnostic tools	27%	15%	69%	42%	67%	35%

● 10-20 ● 20-30 ● 30-40 ● 40-50 ● 50-60 ● 60-70 ● 70-80 ● 80-90

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 the sample It appears that a higher percentage of organizations in India and the UAE were using these solutions 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. India, 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.[11]

When reviewing results across service sectors, mental health services organizations in India were more likely to utilize online self assessment and online webinars and help sessions than phone and video consultations – compared with physical health and social services providers. For instance, utilization of online self assessment and online webinars and help sessions was 95 % each as compared to 86% use of phone consultations and 85% use of video consultations. Use of AI-powered diagnostic tools is also comparatively lesser across physical, mental and social services ranginf between 67% to 71 %. 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.[12]

Developments throughout the COVID-19 outbreak

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

> **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%). 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%).**

Impacts of the pandemic on the ability to deliver services

The pressures caused by the pandemic have undoubtedly been felt by every industry, including HSS. 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.[13] 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. 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.[14] 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.[15]

Staffing capacity has also impacted service delivery, particularly if staff members are required to take time off due to illness or quarantining. Other key challenges include service user reluctance to seek care services due to pandemic concerns, and budgetary or funding concerns.[16]

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.

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?

% Improved   % Worsened   % Stayed the same   % Don't know
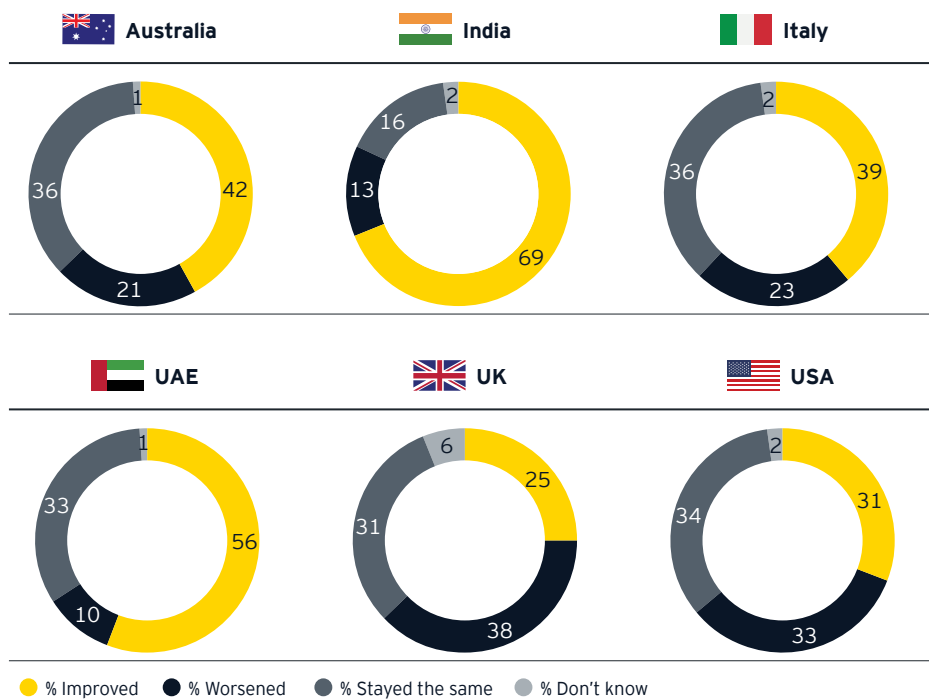
Chapter 2:
Developments throughout the COVID-19 outbreak

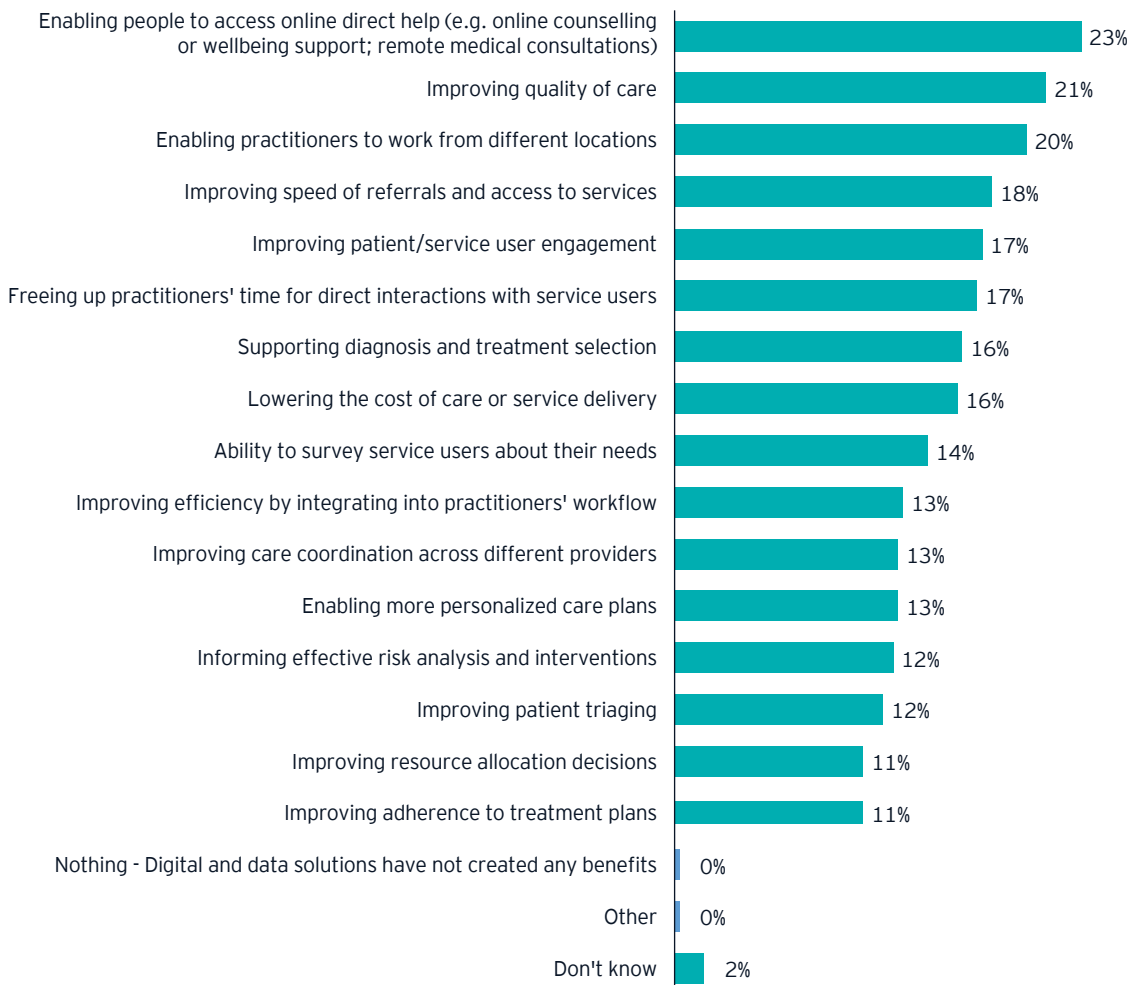**How have digital technologies and data solutions helped HSS organizations?**

Respondents reported that digital technologies and data solutions have created a wide array of benefits for their organizations and 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. At the same time, only fifth (20%) Indian respondents reported this as a top three benefit clearly indicating that more practitioners preferred to physically attend to patients in India than elsewhere. In India more respondents (23%) reported enabling users access to online direct help as a top three benefit. Other common responses were improving care quality (21%), and improving speed of referral and access to services (18%).

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

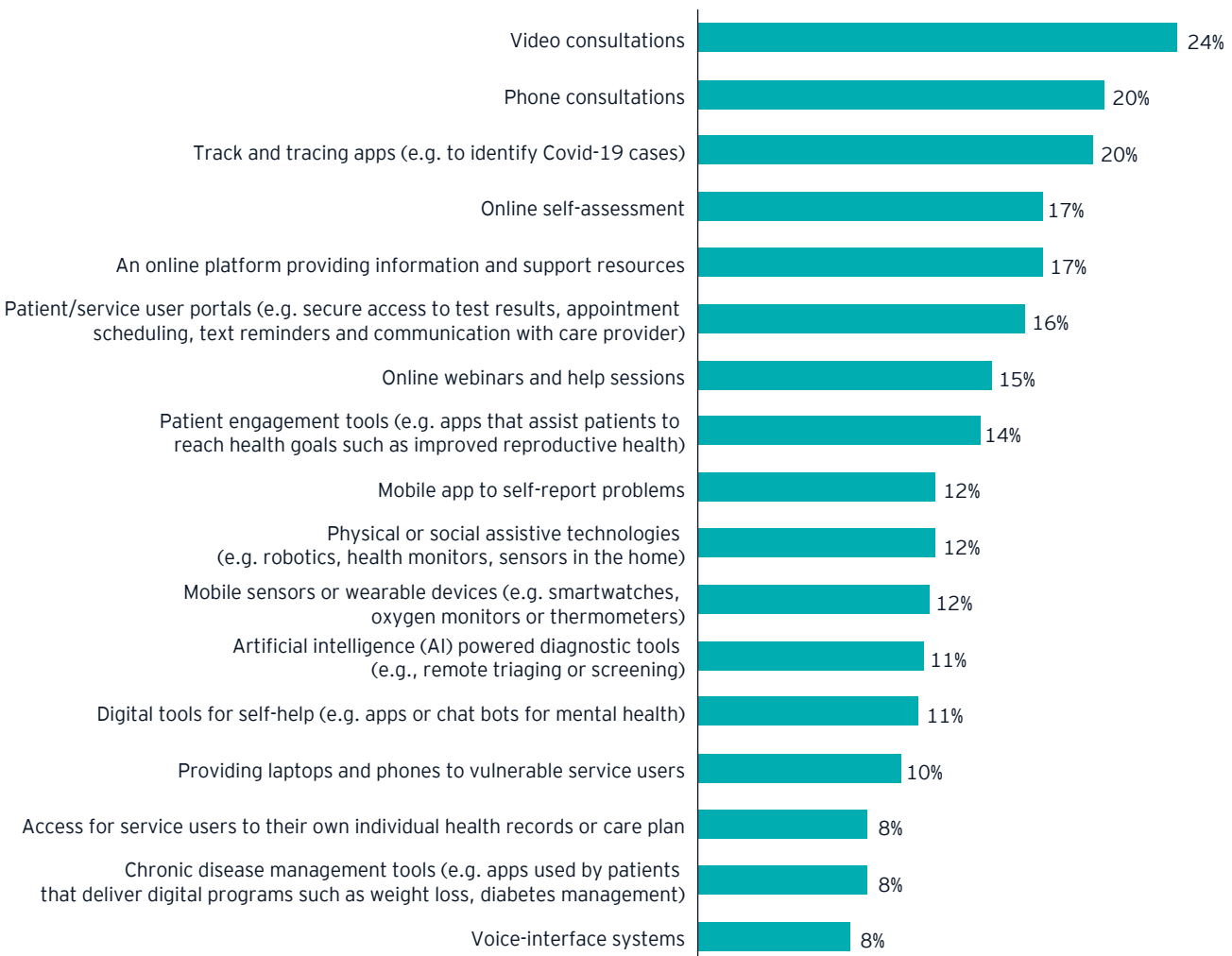| Benefit	%
Enabling people to access online direct help (e.g. online counselling or wellbeing support; remote medical consultations)	23%
Improving quality of care	21%
Enabling practitioners to work from different locations	20%
Improving speed of referrals and access to services	18%
Improving patient/service user engagement	17%
Freeing up practitioners' time for direct interactions with service users	17%
Supporting diagnosis and treatment selection	16%
Lowering the cost of care or service delivery	16%
Ability to survey service users about their needs	14%
Improving efficiency by integrating into practitioners' workflow	13%
Improving care coordination across different providers	13%
Enabling more personalized care plans	13%
Informing effective risk analysis and interventions	12%
Improving patient triaging	12%
Improving resource allocation decisions	11%
Improving adherence to treatment plans	11%
Nothing - Digital and data solutions have not created any benefits	0%
Other	0%
Don't know	2%

Most impactful solutions

Since the onset of the pandemic, HSS 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 in India and the UAE, and 44% of respondents from the UK.

For India, other tools included track and tracing apps(20%), online self assessment(17%) and online platform providing information and support resources (15%).

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?*
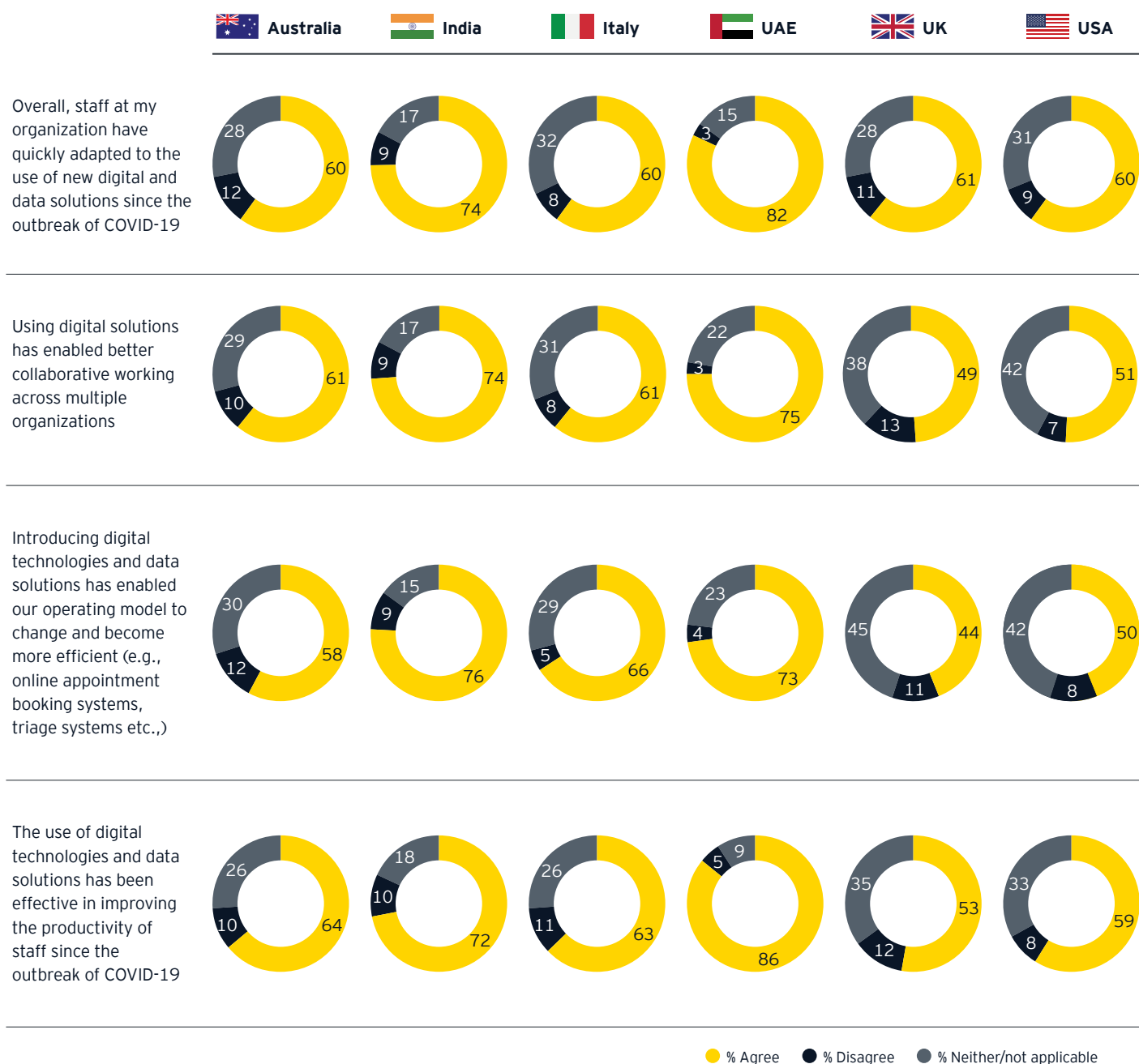
Tool	%
Video consultations	24%
Phone consultations	20%
Track and tracing apps (e.g. to identify Covid-19 cases)	20%
Online self-assessment	17%
An online platform providing information and support resources	17%
Patient/service user portals (e.g. secure access to test results, appointment scheduling, text reminders and communication with care provider)	16%
Online webinars and help sessions	15%
Patient engagement tools (e.g. apps that assist patients to reach health goals such as improved reproductive health)	14%
Mobile app to self-report problems	12%
Physical or social assistive technologies (e.g. robotics, health monitors, sensors in the home)	12%
Mobile sensors or wearable devices (e.g. smartwatches, oxygen monitors or thermometers)	12%
Artificial intelligence (AI) powered diagnostic tools (e.g., remote triaging or screening)	11%
Digital tools for self-help (e.g. apps or chat bots for mental health)	11%
Providing laptops and phones to vulnerable service users	10%
Access for service users to their own individual health records or care plan	8%
Chronic disease management tools (e.g. apps used by patients that deliver digital programs such as weight loss, diabetes management)	8%
Voice-interface systems	8%

Chapter 2:
Developments throughout the COVID-19 outbreak

Respondents across all sectors reported video consultations, phone consultations, and patient and service user portals among the top five most impactful digital solutions. 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 HSS organizations deliver their services. We asked respondents a series of questions 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.

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?*

Physical health services	Social services	Mental health services
1	**1**	**1**
Phone consultations	Phone consultations	Video consultations
35%	26%	52%
2	**2**	**2**
Video consultations	Video consultations	Phone consultations
30%	25%	35%
3	**3**	**3**
Patient/service user portals	An online platform providing information and support resources	Online webinars and help sessions
22%	17%	14%
4	**4**	**4**
An online platform providing information and support resources	Online webinars and help sessions	Providing laptops and phones to vulnerable service users
15%	15%	12%
5	**5**	**5**
Track and tracing apps that identify COVID-19 cases	Patient/service user portals	Patient/service user portals
13%	14%	10%

*Combined global responses, by sector; top 5 responses, by percentage of respondents, within the top 5 across all sectors

66%

of respondents agreed their staff adapted to using new tools

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.

In all the above areas, about three fourth of the Indian respondents reported positive experiences, again potentially due to the breadth of solutions employed throughout the pandemic.

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

	Australia	India	Italy	UAE	UK	USA

Overall, staff at my organization have quickly adapted to the use of new digital and data solutions since the outbreak of COVID-19

Using digital solutions has enabled better collaborative working across multiple organizations

Introducing digital technologies and data solutions has enabled our operating model to change and become more efficient (e.g., online appointment booking systems, triage systems etc.,)

The use of digital technologies and data solutions has been effective in improving the productivity of staff since the outbreak of COVID-19

● % Agree   ● % Disagree   ● % Neither/not applicable

Chapter 2:
Developments throughout the COVID-19 outbreak

Figure 13: To what extent do you agree or disagree with each of the following statements

Statement	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not applicable
Introducing digital technologies and data solutions has enabled our operating model to change and become more efficient (e.g. online appointment booking systems, triage systems etc.)	43%	32%	14%	6%	3%	2%
Introducing digital technologies and data solutions was a temporary measure to help our organization get through the pandemic period	37%	31%	18%	9%	4%	2%
My organization is using digital and data solutions to meet the needs of patients/service users more effectively than before the outbreak of COVID-19	42%	33%	16%	4%	3%	2%
Overall, staff at my organization have quickly adapted to the useof new digital and data solutions since the outbreak of COVID-19	40%	34%	14%	6%	3%	3%
Telephone or video consultations have proven effective substitutes for face to face consultations	41%	32%	16%	6%	4%	1%
Using digital solutions has enabled better collaborative working across multiple organisations	41%	33%	14%	6%	4%	1%

Legend: ■ Strongly agree ■ Tend to agree ■ Neither agree nor disagree ■ Tend to disagree ■ Strongly disagree ■ Not applicable

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 14.

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

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?

	Australia	India	Italy	UAE	UK	USA
The quality of experience for patients and service users	61 / 10 / 29	76 / 9 / 15	62 / 11 / 27	81 / 4 / 15	46 / 14 / 40	58 / 9 / 33
Access to care when and where people need it	66 / 9 / 25	77 / 8 / 15	58 / 12 / 30	82 / 2 / 16	46 / 14 / 40	64 / 6 / 30
Delivering better outcomes for patients and service users	65 / 9 / 26	77 / 9 / 16	57 / 10 / 33	82 / 3 / 15	44 / 13 / 43	56 / 7 / 37
The productivity of staff	64 / 10 / 26	72 / 10 / 18	63 / 11 / 26	86 / 5 / 9	53 / 12 / 35	59 / 8 / 33

● % Effective ● % Ineffective ● % Neither/don't know
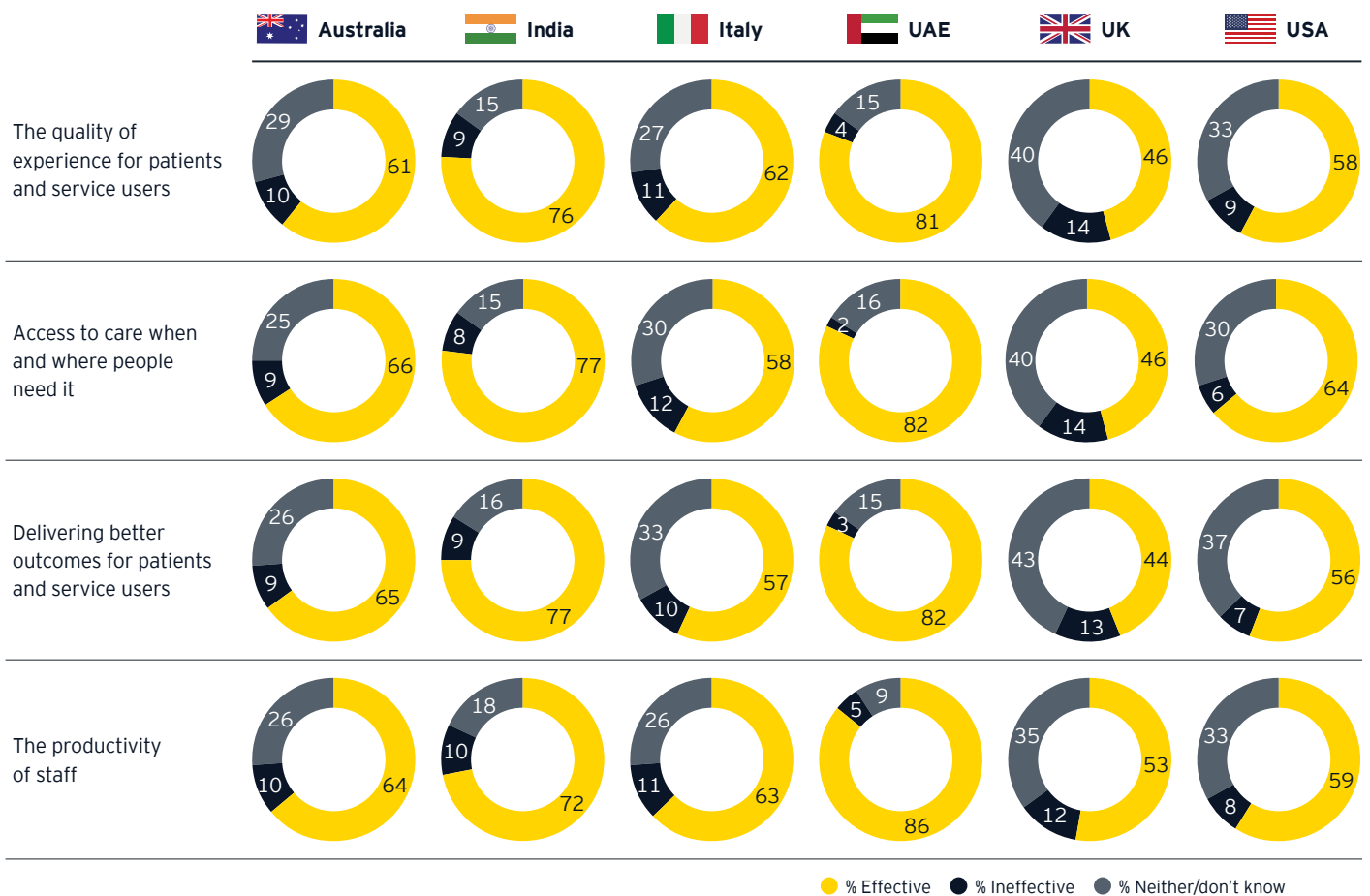
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Figure 15: In your organization, to what extent do you think the use of digital technologies and data solutions has been effective in improving each of the following areas since the outbreak of COVID-19?

	Physical health	Mental health	Social services
The quality of experience for patients and service users	24 / 10 / 66	24 / 11 / 65	29 / 10 / 61
Access to care when and where people need it	23 / 9 / 68	25 / 8 / 67	31 / 7 / 62
Delivering better outcomes for patients and service users	27 / 8 / 65	31 / 9 / 60	31 / 9 / 60

● % Effective   ● % Ineffective   ● % Neither/don't know
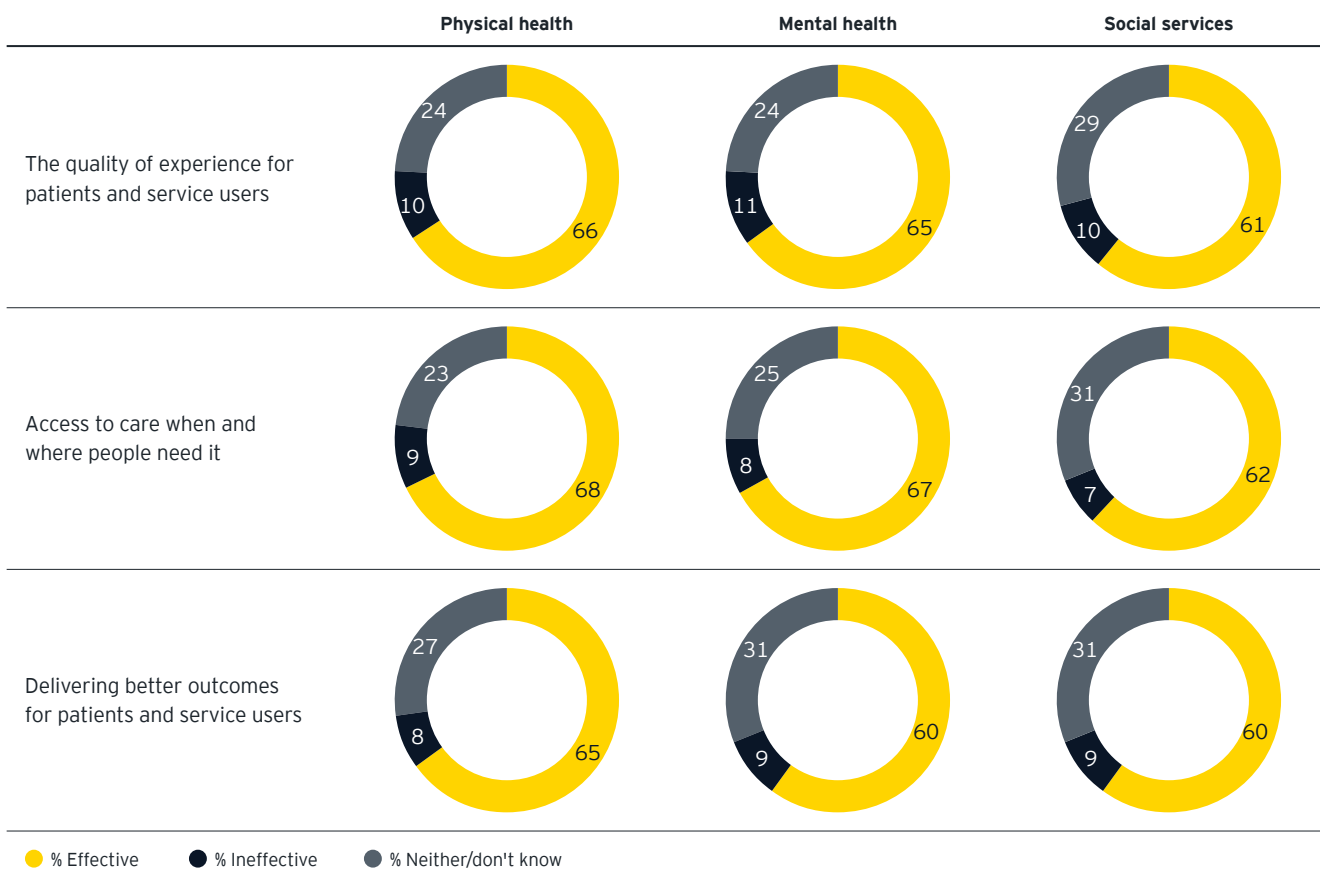
Responses were also fairly uniform across service sectors, though in physical health, mental health and social service organizations, improvement in access, outcomes and the quality of experience was said to be most, respectively, in India.

However, it is important to note that figures 14 and 15 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).[17] 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). These and other factors may further exacerbate inequalities.

Implications for the future

There are a number of uncertainties regarding the trajectory of the pandemic and its effects on our daily lives. With "business as usual" slowly coming back, organizations will most likely continue to deploy new digital and data solutions and hone the use of those already implemented.

This section outlines the expected investment in digital technologies and data solutions over the next three years, highlighting which technologies are likely to "stick" after the pandemic and which factors will affect widespread adoption of these tools in the future.

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 16). This figure varied widely by country, with 75% of the respondents from India responding positively, compared with only 34% of the UK respondents.

However, around 11% of the respondents from India 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.

Even though results were fairly uniform across private, public, and non-profit, charity and volunteer sectors, with 47%–51% of respondents reporting planned investments across sample countries. An overwhelming number of (86%) public sector respondents in India were affirmative in their response as against 71% from private sector and 68% from voluntary/ non-profit organisations. Across sample countries, 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. The scenario in India is opposite as 81% respondents therein reported planned investments in these solutions as compared with 77% and 76% for physical health services and social services, respectively.

Figure 16: Is your organization planning any investment in digital technologies and data solutions over the next three years?

- % Yes
- % No
- % Don't know
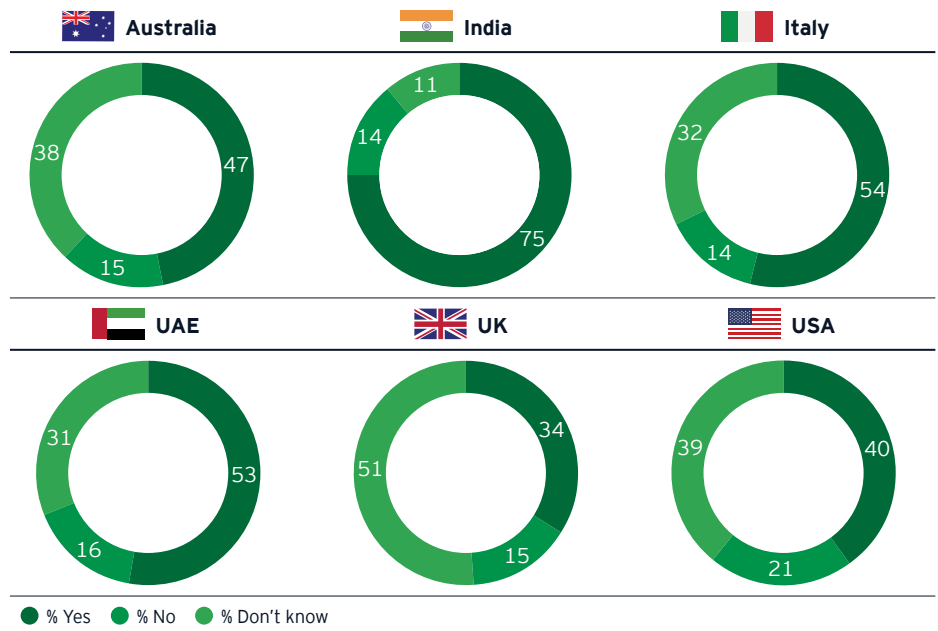
Figure 17: And, regarding investment in digital technologies and data solutions, what will be the level of investment compared with the previous three years?

- % Increase of more than 100%
- % Increase between 20% and 100%
- % Increase of less than 20%
- % Same
- % Decrease
- % Don't know
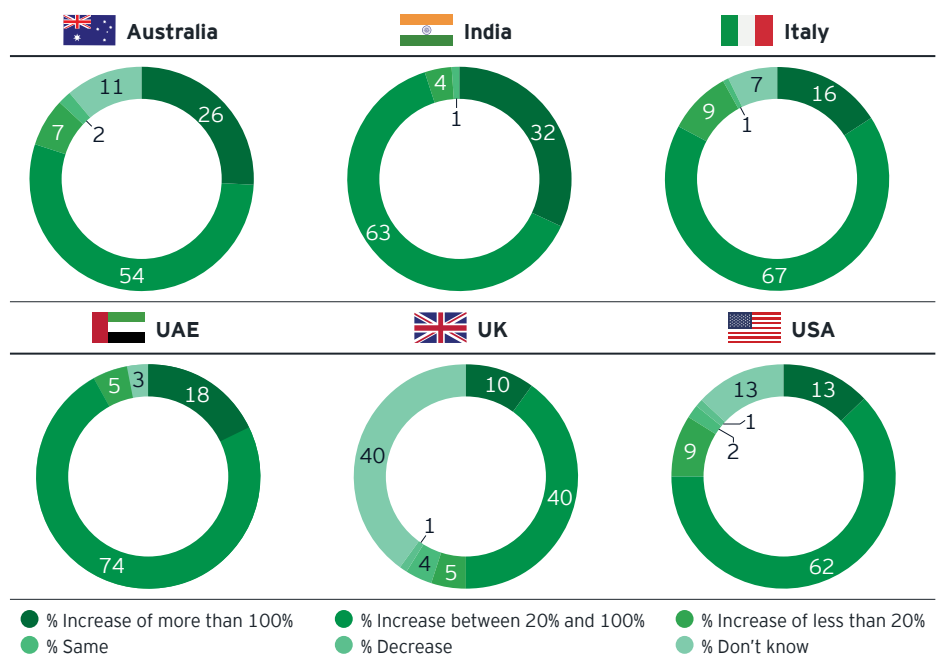
Chapter 3:
Implications for the future

Those planning to invest in this area, almost universally, reported an increase in investment compared with the previous three years, with 79% of the respondents reporting at least a 20% increase. This number was much higher at 94% for India with 32% reporting substantial investment of more than 100% with another 42% reporting a significant investment between 50% to 100%. This likely reflects a combination of factors, including increased demand for these services and perceived and visible benefits by the staff and practitioners.

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 18).

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 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

Figure 18: Introducing digital technologies and data solutions was a temporary measure to help our organization get through the pandemic period.

Australia	India	Italy	UAE	UK	USA

Physical health services	Mental health services	Social services	Private sector	Pubic sector	Voluntary/charity/ non-profit sector

● % Agree　● % Disagree　● % Neither/not applicable
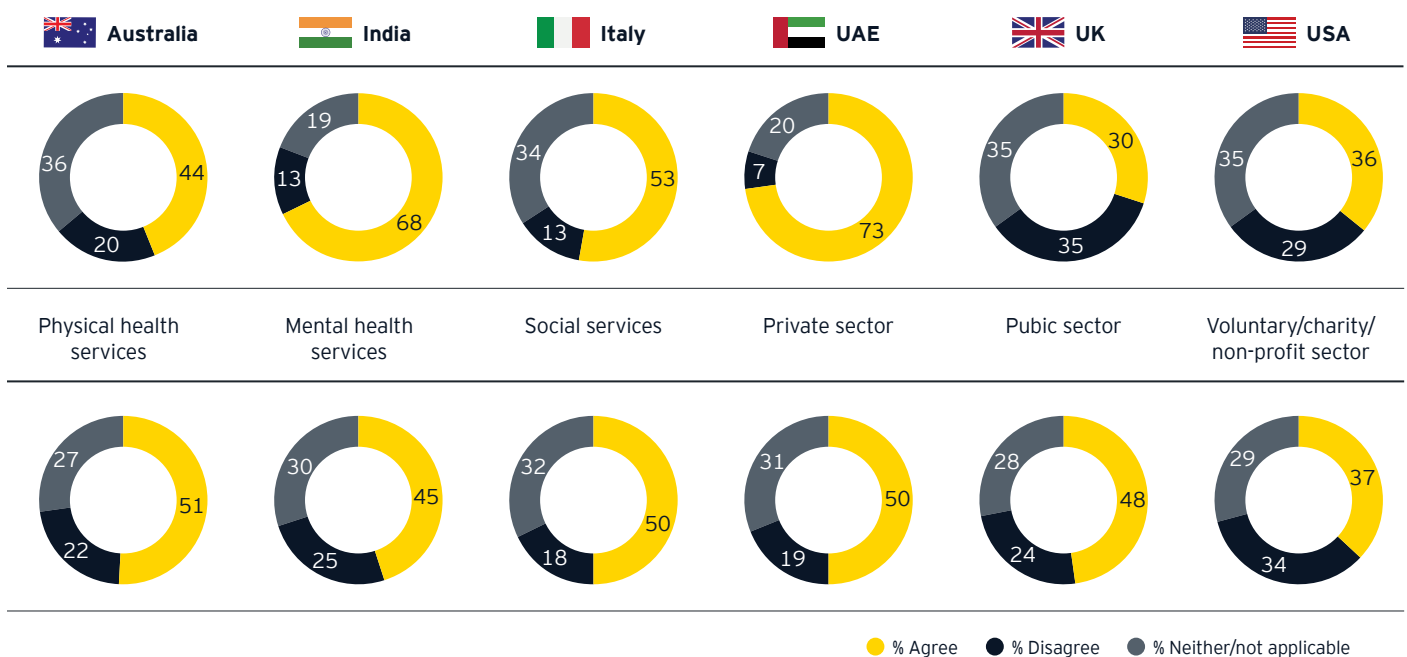
Figure 19: Over the next three years, how likely or unlikely is your organization to continue using these digital technologies and data solutions for patients or service users?*

Technology	Likely	Neither	Unlikely	Don't know
Phone consultations	68%	11%	17%	4%
Video consultations	67%	11%	18%	3%
An online platform providing information and support services	65%	13%	17%	5%
Online webinars and help sessions	65%	12%	19%	4%
Patient/service user portals	63%	13%	20%	4%
Access for service users to their own individual health records or care plan	61%	15%	20%	4%
Patient engagement tools	61%	15%	21%	3%
Online self-assessment	58%	17%	21%	4%
Track and tracing apps that identify COVID cases	58%	16%	22%	4%
Mobile app to self-report problems	58%	15%	24%	3%
Providing laptops and phones to vulnerable service users	58%	17%	22%	4%
Digital tools for self-help	57%	17%	22%	4%
Chronic disease management tools	57%	16%	23%	3%
Mobile sensors or wearable devices	56%	16%	23%	5%
Physical or social assistive technologies	55%	17%	25%	4%
AI-powered diagnostic tools	55%	16%	26%	3%
Voice interface systems	52%	19%	23%	6%

■ Likely ■ Neither ■ Unlikely ■ Don't know

nuance may not have been captured in the question.

As shown in figure 19, a 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. 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, a 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. HSS 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 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.

Chapter 3:
Implications for the future

HSS 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 provide service users with tools required to access remote services (e.g., laptops, mobile phones and internet connections). HSS 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 HSS 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 –

Factors affecting continued use

- User adoption and demand
- Funding and reimbursement
- Interoperability
- Regulation and data security
- Provider adoption and buy-in

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, 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:** HSS 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 above mentioned 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 HSS 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.

How EY can help?

With "Health and wellbeing for all at all ages" being one of the core principles driving the National Health Mission in India, it is imperative that due attention is given to the establishment of a Digital Healthcare Ecosystem in the country.

As is evident from the survey conducted by EY and YouGov in India, along with the citizens who are at the centre of the healthcare continuum, the healthcare service providers, governing and authorizing bodies, private sector and public sector entities, researchers, medical professionals, and various institutions delivering the complete value chain of services and infrastructure, are all intended beneficiaries and contributors of the Digital Healthcare Ecosystem.

It is heartening to note that India has witnessed the proliferation and success of metadata aggregators in various sectors (Travel, Insurance, Food Delivery, Grocery Delivery, etc), who provide the ease and comfort of one-click access for various levels of product and services availability in a location. For example, from the comfort of the home or using a mobile device, Trip Advisor and the like provide the complete exploring and planning capability to citizens for accommodation, travel option, travel forums, things to do, restaurants, etc, while being able to reflect on the quality, service levels and the cost aspects.

The pandemic has proven that a piece of right information if available at the time of real need can save lives. The significance of information resulting out of the survey com plements the need for adequate information management and access. Similar integrated view of all healthcare facilities and services in a location, provided through a common and easy to use intuitive interface, that cuts across information on facilities, doctors, nurses, beds, trauma services, etc is the need of the hour for Healthcare in India. Such information, easily accessible and updated in near real time, would help bring all the stakeholders in the Healthcare Value Chain on one single platform.

This is further substantiated by the fact that amongst the digital technologies and data solutions identified that have helped organizations to deliver better and more efficient outcomes for patients and service users, apps for track and tracing, apps for connecting with patients and online platforms providing information and support resources have emerged as critical areas.

The outbreak of the pandemic turned out to be a propeller driving data analytics interventions for various aspects of Demand and Supply Planning, and enabling detailed analysis using insightful dashboards and simulation models. Amidst the

spiking COVID-19 cases and frequent emergence of new containment zones, there emerged a pressing demand for a dynamic way of planning resources and ensuring availability of required facilities to manage the pandemic. At the same time, adequate measures had to be taken to control spread of the pandemic by ensuring adherence to quarantine and containment rules. In such a dynamically changing situation, data analytics was leveraged to address two key objectives:

Resource Planning Measures: Institute measures to conduct simulations of various case types for next 30-60-90-day periods, conducting a detailed assessment of current capacities and supplies, and the expected shortfalls. This empowered state and district level administration in taking informed and fact-based decisions on identification of containment zones and lockdown restrictions, ensure better coordination amongst various departments, and in managing varying inventories across health facilities for optimum and timely utilization of resources.

Quarantine Management and Tracking Solution: Institute technology driven measures for real-time monitoring and tracing of people in quarantine, in order to enable authorities to take proactive and preventive measures to control movement. Data Analytics provided an extremely effective mechanism

to identify and monitor clusters of citizen group behaviours (based on demographic and localization factors, age, gender, co-morbidities, residence, proximity to health facilities or essential commodities service areas, etc) and the ever-changing impact on COVID-19 transmission.

As a key learning post the pandemic situation, ability to integrate data sets for real-time analysis for epidemiology, analysing the risk factors and forecasting/planning interventions for preventive healthcare would be crucial. Data analytics used on the integrated set of information could provide very meaningful and timely insights like:

Survival Analysis - To investigate the effect of exposure to an event and subsequent health events by comparing the post event hospitalization experiences of various event exposure groups.

Cross sectional studies - To detect associations between diet and serum cholesterol in cross-sectional population studies.

Population Studies - To evaluate quantile regression model performance for high cost patients, to answer how a small percentage of a population accounts for a large percentage of healthcare expenditures.

Prediction of disease outburst based on historical patterns and other significant indicators- Another critical aspect emerging from the survey results, drives us towards enhanced focus on the training and enablement of healthcare workers and professionals in the usage of digital and data driven systems. For example, with support of digital tools, in the Primary Healthcare setup, Asha workers may be empowered to undertake certain level of screening of patients and documenting, thus reducing the load on doctors who should be focused more on diagnosis and prescription.

Data Privacy issues and protecting citizen identity have emerged as the core concern areas, that inhibit the widespread integration of individual level data across different systems across agencies. To alleviate and address such concerns, user consent-based framework for information aggregation and sharing may be advocated. Tools such as anonymization of data may be provided at a service layer. Insights made available digitally, as additional comments, would only be a step forward in enriching easy availability of background information on case notes. This would also alleviate any concerns about data and technology replacing the human touch, with is so significant for healthcare services.

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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.

The report 'Embracing digital: is COVID-19 the catalyst for lasting change?' – India edition, captures the responses of 359 participants, including respondents who serve in management-level roles and above, ranging from junior and middle managers to owner or proprietors to chief executives, representing public and private sector, not-for-profit organizations and few others.

Further details of the sample are included in the figures 1 and 2 below.

All respondents work in HSS 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

Respondents by HHS sector

18, 42, 13, 27

- ● % Physical health ● % Mental health
- ● % Social services ● % Other

Respondents by country (n2,243)

9, 16, 10, 14, 26, 25

- ● % Australia ● % India ● % Italy
- ● % UAE ● % UK ● % USA
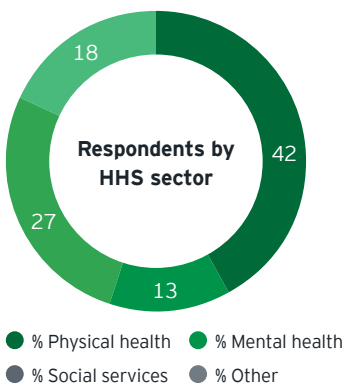
Characteristics of survey respondents, by organization type and size

Organization type, by sector

10, 2, 41, 47

- ● % Public sector ● % Private sector
- ● % Voluntary/charity/not-for-profit ● % Other

Organization size

4, 26, 12, 17, 10, 31

- ● % Under 50 ● % 50-100 ● % 101-500
- ● % 501-1,000 ● % Over 1,000 ● % Don't know
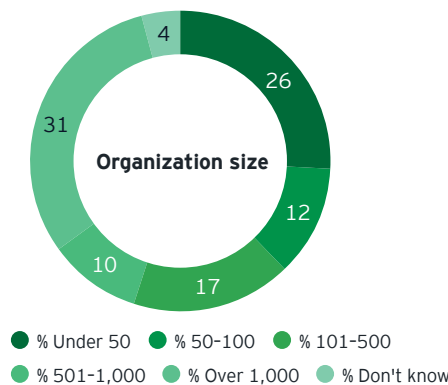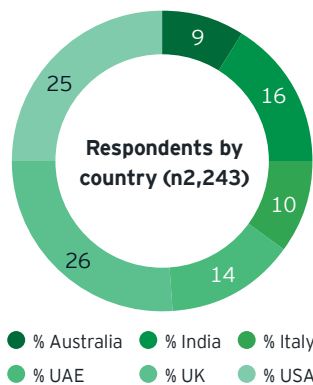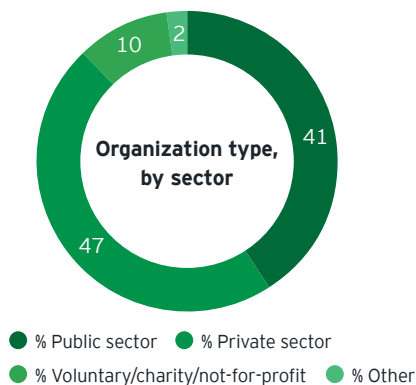
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