



PANEL DISCUSSION ON **Building and Scaling** **Solutions for Digital** **Health in the Global South**

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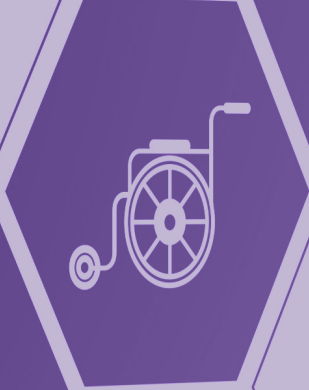
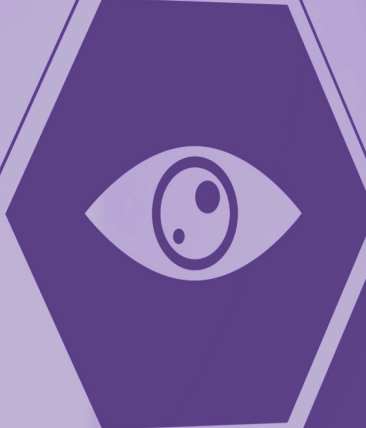
MEDICAL



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Health Care
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Executive Summary

Digital health has emerged as a potential game-changer for enabling accessible, affordable, and quality healthcare for all. The global digital health market was valued at \$263 billion in 2022. The Global South, in its quest for universal health coverage, is seeing increased adoption of digital health, particularly due to **changes in patient and provider behaviour, increased market investments and emerging policy trends**. Strong digital health solutions can help in tackling public health emergencies and in improving access, affordability, and quality of healthcare regardless of one's physical location – leading to improved health and well-being for all.

However, fragmented digital health policies, coupled with infrastructural challenges can limit the reach and adoption of digital health in underserved communities. The direct replication of solutions from one region to another, without critically assessing needs and contextual specificities, would also be detrimental to their success.

Sattva Consulting, in collaboration with the Aga Khan Foundation, organised a panel discussion on Building and Scaling Solutions for Digital Health in the Global South in London, in September 2023, with experts in the digital health sector and diverse participants from varied backgrounds from corporations, philanthropic foundations, non-profit organisations, and multilaterals. This report captures key insights from the event and explores opportunities for stakeholders to explore and design equitable solutions that can be scaled and implemented across the Global South.

Participants noted that the lack of collaboration with government stakeholders and policymakers can hinder the formulation of effective digital health policies. Thus, for the successful deployment of digital health solutions, **leveraging opportunities within emerging public health policies, and building upon existing policy initiatives is paramount**. The private sector plays a critical role in driving the adoption of digital health solutions. **Strategic purchasing initiatives** such as government stand-alone contracting-out (CO) initiatives with private providers delivering primary, diagnostic, and secondary care and government-funded insurance schemes of private hospitals/facilities, alongside public sector and parastatal hospitals as a tool, can facilitate this.

As digital health solution providers design and work through interventions, it is critical to understand the **dynamics operating within the hierarchies among healthcare professionals and showcase value to each actor to ensure success**. Additionally, **harnessing artificial intelligence from the very inception of solution design can be very effective**. However, care needs to be taken regarding substantial investments in data governance, algorithm management, and a comprehensive assessment of the social and environmental consequences of AI.

In order for digital healthcare infrastructure to thrive, it is necessary to **establish underlying basic infrastructure** such as electricity, hardware, internet and interoperability between private and public systems in healthcare delivery centres. Considering strategies for designing and implementing digital health solutions **informed by regional perspectives from ethnographic research** is vital to deliver effective solutions. It was concluded that **figuring out the correct financial model** is critical for de-risking and complementing capital investments across the value chain of solution development.

Digital Health and its Evolution

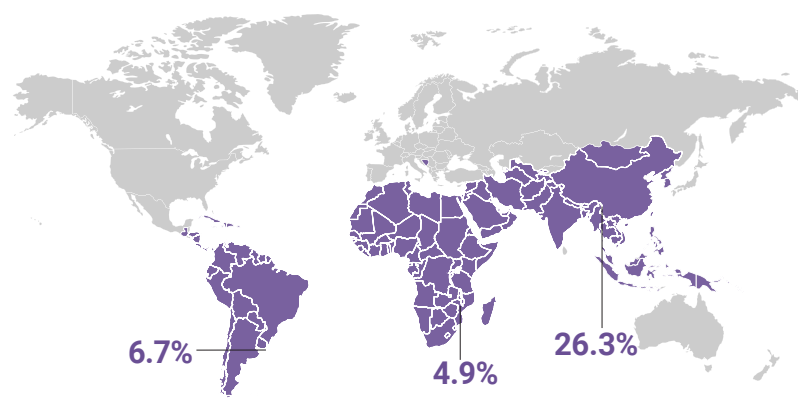
Digital health, encompassing digital, mobile, and wireless technologies, represents a promising frontier for advancing healthcare goals. Despite the booming technology sector, its potential in healthcare remains largely untapped. The integration of digital solutions promises to revolutionise health systems by enhancing efficiency and sustainability, ultimately facilitating the delivery of high-quality, affordable, and equitable healthcare.

Healthcare delivery can be improved substantially with an array of technologies – including blockchain, artificial intelligence, smart wearables, digital therapeutics, digital tools, platforms, big data analytics, the Internet of Things, and virtual healthcare. These technologies can enhance medical diagnoses, data-driven treatment decisions along the continuum of care, self-management, and the generation of evidence-based knowledge.¹

Digital health has evolved from telemedicine, the application of which spans several decades. Early mentions of its potential date back as far as 1879, when an article in *The Lancet* discussed using the telephone to reduce unnecessary in-person doctor visits. In 1925, the *Science and Invention* magazine even depicted a doctor diagnosing a patient through the radio and envisioned a device for video examinations over a distance.² Applications of telemedicine have extended beyond Earth, with NASA utilising it to monitor the health of astronauts in space and for medical purposes on Earth.³

In low and middle-income countries (LMICs), digital health has emerged as a solution to overcome traditional healthcare challenges – particularly staffing and infrastructure limitations – focusing on scalability, integration, and sustainability to improve processes and outcomes.^{4,5} The past two decades have seen a growing emphasis on fostering digital health adoption in the Global South, with countries like Malawi, Cabo Verde, Ghana, and Kenya in Africa, and Argentina and Brazil in Latin America, leading the way in implementing digital tools to enhance healthcare services.^{6,7} The COVID-19 pandemic accelerated the integration of digital health solutions worldwide. Nations like China, India, and Indonesia in Asia have emerged as notable examples of digitalised healthcare ecosystems.

Figure 1: The global digital health market size was valued at \$263 billion in 2022 (Region-specific market Share in %)⁸



Tailwinds Supporting the Adoption of Digital Health Solutions in the Global South

Change in patient and provider healthcare behaviour

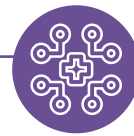
Nearly one-third of the population in LMICs resides more than two hours away from essential healthcare services. The healthcare worker-to-population ratio in these countries is generally inadequate when compared with the recommendations of the WHO. However, the pandemic not only expedited the expansion of digital healthcare tools – with numerous companies embracing digital healthcare technologies to deliver services – but it also led to a surge in user adoption.⁹



MyDoc, a telemedicine platform based in Singapore, experienced a **60%** increase in daily active users in February 2020, which further surged to more than double in March.¹⁰



User penetration of digital health in Nigeria was **13.37%** in 2022 and is expected to hit **19.20%** by 2027. The surge in digital health startups can be attributed to a sizable market with a population of over 180 million people, which is driving demand for healthcare services within the nation.¹¹



Digital health adoption amongst users is expected to reach **25.61%** in Latin America, **13.66%** in Africa, and **13.07%** in South Asia by 2023.^{12,13,14}

Market investment trends in digital health

Collaborating with the private sector is crucial for the digitalisation of healthcare. The WHO has also emphasised the significance of meticulous planning in implementing digital health interventions to ensure enduring and effective outcomes. This can be achieved through impactful investments in the array of solutions available.



Over the last two years, the digital health sector in Africa has experienced remarkable expansion, having garnered **\$123 million** in investments, distributed among 55 startups in 2021.¹⁵



Health tech startups from India form **92%** of South Asia's innovation ecosystem, as **7,128 startups** populate India's digital healthcare ecosystem as of 2022.¹⁶

Emerging policy trends

The Global Initiative on Digital Health by WHO works to promote equitable access to digital health. The initiative functions as a platform, bringing together a broad global ecosystem to collaboratively enhance country capacity and bolster international cooperation in the field of digital health.¹⁷

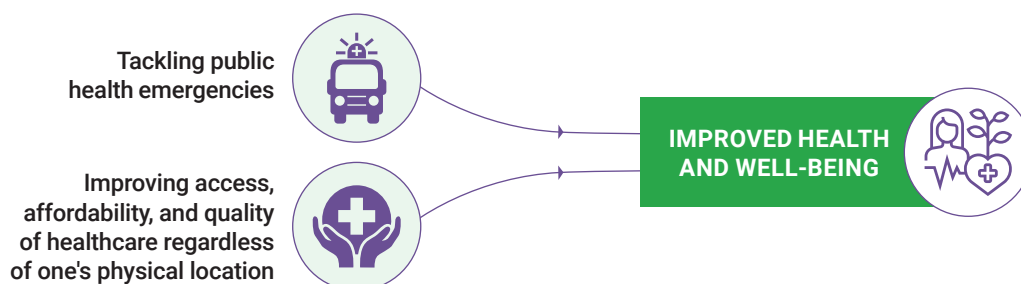
Governments play a pivotal role in driving national digital health strategies by establishing clear objectives, well-defined roadmaps, and allocated budgets. This encompasses the development of robust regulations to govern the expanding digital ecosystem, including provisions for data management, data protection, and device regulations. Moreover, governments facilitate payment systems to promote adoption among vendors. To bolster these efforts, governments support open data standards and create adaptable platforms and technologies suitable for resource-constrained settings – such as streamlined yet interoperable Electronic Health Records (EHRs) that enable seamless health data exchange and e-prescriptions. A vital aspect is ensuring an enabling infrastructure, which encompasses widespread mobile and internet coverage, consistent power supply, and the utilisation of cloud-based data hosting. These endeavours are complemented by efforts to enhance digital literacy and provide essential workforce training.¹⁸

Role of Digital Health Solutions in Achieving Universal Health Coverage

Early this year, the WHO South-East Asia Regional Office (WHO SEARO) and the Government of India co-hosted a global conference on ‘Taking UHC to the Last Citizen’ through Digital Health solutions. In her keynote address, the Regional Director of WHO SEARO, Dr. Poonam Khetrupal, affirmed that Digital Health is a critical imperative for its ability to “democratise healthcare and fast-track” collaborative action towards Universal Health Coverage.¹⁹ Therefore, there is clear recognition at the highest levels of global health planning that digital solutions can indeed help to plug the gaps in service delivery and facilitate the journey towards UHC.

Digital health solutions can accelerate the attainment of healthcare objectives for the public by enhancing service provision across the entire spectrum of care, encompassing prevention such as screening and diagnosis, treatment, and post-treatment. These solutions can help in tackling public health emergencies and in improving access, affordability, and quality of healthcare regardless of one's physical location thereby leading to improved health and well-being for all.

Figure 2: Improved health and well-being is an overarching goal



Tackling public health emergencies

Digital technologies are being leveraged to aid in public health emergencies, contributing to population surveillance, case identification, contact tracing, and evaluating interventions through the analysis of mobility data and effective communication with the public.

Amid Nigeria's initial COVID-19 surge, Nigeria CDC efficiently utilised social media, electronic messaging, telecommunication, and AI-powered interactive voice response systems to rapidly share accurate information and counter misinformation.

In Rwanda, the District Health Information Software system provided real-time surveillance data, facilitating swift contact tracing and case management for infected individuals.

In health emergencies like tuberculosis, HIV, and malaria, Africa has benefited from various responses. Ghana, Kenya, and Tanzania have adopted cloud-based mHealth smart readers to quickly interpret and share diagnostic malaria test results with patients.²⁰

Improving access, affordability, and quality of healthcare regardless of one's physical location

Digital health solutions such as teleconsultation, e-pharmacy, home diagnostics and teleradiology can empower users and enable them to access healthcare services either at the point of care or remotely, and reduce financial challenges, thereby enabling a pathway to greater coverage of healthcare services.

A study recommends the creation of culturally sensitive interventions in multiple languages, coupled with digital skill development sessions, to not only improve the availability but also enhance the appeal of digital health services within South Asian communities. This approach aims to reduce health inequalities and foster a more inclusive healthcare system.²¹

In 2010, North Korea embraced telemedicine and operated a national eHealth centre. This enables virtual consultations, allowing specialists to provide diagnosis and treatment guidance to patients in distant regions improving access to healthcare. A telementoring system for surgery is accessible to all provincial, city, and county hospitals.²²

Improved health and well-being

Disease outbreaks become more predictable and can be proactively addressed with the help of health surveillance data. Healthcare providers are able to preemptively identify risks for individual patients through access to their longitudinal EHRs. Furthermore, the reach of screening and diagnosis can be expanded to larger populations through the deployment of point-of-care devices, facilitating more widespread and timely healthcare interventions.

Sri Lanka has successfully implemented and expanded an electronic reproductive health management information system (eRHMIS), initially introduced in 2016. This has led to comprehensive, timely, and top-quality data collection, analysis, and utilisation across all healthcare tiers in Sri Lanka. The adoption of eRHMIS has played a crucial role in achieving ongoing decreases in maternal and child mortality rates and enhancing nationwide reproductive, maternal, newborn, child, and adolescent health services.²³

Digital Health Solutions in the Global South: Insights from the Event

Sattva, in collaboration with the Aga Khan Foundation, engaged with an esteemed panel of experts consisting of **Dr. Lisa Murphy, Technology Lead, Wellcome Trust; Sameer Kanwar, Director for Digital Health at PATH, South Asia Region; Dr. Shehla Zaidi, Professor of Health Policy & Systems at Aga Khan University, Pakistan; Steven Serneels, Co-founder at Iristick; Dr. Dorairaj Prabhakaran, Executive Director, Centre for Chronic Disease Control; and Adirupa Sengupta, Group Chief Executive at Common Purpose in a discussion on Building and Scaling Digital Health Solutions for the Global South.** The event also drew a diverse range of participants from varied backgrounds and organisations, including corporations, philanthropic foundations, non-profit organisations, and multilaterals who actively engaged in the discussion.

The event focussed on understanding the current landscape of digital health solutions in the Global South, commonly faced challenges in the implementation of digital health solutions, and opportunities ahead for actors in public health and digital innovation to design equitable solutions. The following section will delve into the insights from the discussion.

Leveraging policy windows and building upon existing policy initiatives is paramount, in order to ensure the successful deployment of digital health solutions and extend their reach to underserved areas.

With the increasing prominence of digital health, a growing number of startups are offering innovative solutions in this space. However, despite the availability of numerous solutions, many do not reach the most remote and underserved areas. To address this gap, it is crucial to establish effective digital health policies. Lack of collaboration with government stakeholders and policymakers can hinder the formulation of effective digital health policies and impede the flow of information to technical teams regarding impending regulatory shifts.²⁴

Policy windows for digital health should be maximised and policy drivers should be understood to create effective solutions. In Pakistan, the pandemic acted as an avenue for integrating digital systems and bringing together public and private healthcare providers. The government also took a proactive role in bridging these realms, overseeing case reporting,

bed allocations, and related data. Consequently, digital health systems like dashboards and data management systems emerged as a response to the pandemic. These systems addressed critical needs, aiding policymakers at various levels, including planning, healthcare, and security agencies.

“In order to realise the full potential of digital health, countries need a digital health strategy and a platform that brings together the relevant stakeholders, such as government, civil society, healthcare providers, funders, innovators, etc.”

– Dr Shehla Zaidi, Professor of Health Policy and Systems Research; HPSR Group Leader, AKU

The private sector plays a critical role in driving the adoption of digital health solutions and using strategic purchasing as a tool, can facilitate and support it.

Strategic purchasing in healthcare is a proactive and evidence-based process designed to maximise health system objectives. It involves defining specific health services to be procured, determining the providers from whom these services should be purchased, establishing payment methods, and setting appropriate rates for these services. The WHO states that strategic purchasing is vital for countries to be able to progress towards Universal Health Coverage.²⁵

Strategic purchasing initiatives, such as government stand-alone contracting-out (CO) initiatives with private providers delivering primary, diagnostic, and secondary care, and government-funded insurance schemes of private hospitals/facilities, alongside public sector and parastatal hospitals, have seen impacts on outpatient care, particularly maternity care but there is scant evidence on other services.²⁶

A policy focus on integrating evaluations within programmes – which could inform design changes – is crucial to achieving broader service utilisation, promoting the adoption of standardised outcome metrics, and gathering more detailed utilisation data from private providers.²⁷

As digital health solution providers design and work through interventions, it is critical to understand hierarchical dynamics within the healthcare system and showcase value to each actor within the hierarchy to ensure success.

While there are a lot of digital health solutions present, it is imperative to look at testing and building solutions on the ground and what are they solving for the last mile, in order to become effective.

Proactively looking at relationships in the healthcare system, such as those between doctors, nurses, and CHCs, and in the community is essential to designing effective solutions. The introduction of technology undoubtedly streamlines the tasks of community health workers, but it can also evoke apprehension among higher-level stakeholders, like doctors, who may perceive it as a potential threat to their roles. Consequently, they might exhibit resistance to it. Emphasising the value of digital solutions to stakeholders further up the chain and incorporating this awareness into solution design is crucial for ensuring the adoption and outreach of the solution to the last mile.

Healthcare workers also serve as the primary conduits for facilitating the adoption of digital health solutions. It is therefore necessary to communicate and demonstrate the value of solution adoption to them. In order to facilitate rapid adoption, solutions should be designed in ways that aid health workers in their jobs. In Uttar Pradesh, India, healthcare workers were introduced to a digital solution designed to streamline their workflow by eliminating the need to input the same information multiple times. This initiative aimed to enhance efficiency and reduce redundancy in data entry processes, ultimately improving the overall effectiveness of healthcare services in the region. The value of the solution was effectively communicated to them, and its presentation as a job-aid facilitated smoother adoption.

Harnessing artificial intelligence from the very inception of solution design can serve as a catalyst in both the creation and implementation of effective solutions.

Stakeholders must realise the value of underlying systems, such as artificial intelligence, in the creation of effective solutions in digital health. The AVATAR study by the Wellcome Trust for people with schizophrenia uses an AI-generated simulation (avatar) created by the patients themselves. The therapy can help reduce auditory hallucinations in people with schizophrenia when used alongside other treatments and has demonstrated improvements in the avatar treatment group at 24 weeks.²⁸

Creating ethical and safe AI systems for healthcare organisations poses a formidable challenge, demanding substantial investments in data governance, algorithm management, and a comprehensive assessment of the social and environmental consequences of AI. The responsible development of AI mandates cross-disciplinary and cross-sectoral cooperation, involving data scientists, healthcare providers, and policymakers. This collective approach is crucial for establishing a sustainable AI ecosystem that benefits all stakeholders and society at large.²⁹

It is imperative for philanthropic funders to have a comprehensive understanding of the overall solutioning system. Developing a coherent strategy is essential, and philanthropists should be cognisant of the specific problems they aim to address, aligning their investments accordingly.

“Organisations are often quick to fund digital health solutions, like apps, but we need more funders to support the technical infrastructure that these apps will plug into.”

– Dr Lisa Murphy, Technology Lead, Wellcome Trust Data

In order for digital healthcare infrastructure to thrive, it is necessary to establish underlying basic infrastructure in healthcare delivery centres.

There is a lack of basic infrastructure to support digital health infrastructure. Unreliable access to electricity for device charging, and lack of access to high-quality hardware restrict the potential for scaling up, necessitating funding support from the private sector.³⁰

Internet accessibility remains a significant barrier in numerous LMICs, particularly due to insufficient infrastructural coverage in rural and remote regions, along with the high costs of Internet services.³¹

As much as securing basic physical infrastructure is important for the functioning of technological solutions, interoperability between different solutions is important for a fully functional infrastructure. It is necessary to establish interoperability between private and public ecosystems. Recognising the significance of the private sector as a vital facilitator is crucial, as 70% of healthcare services are delivered through private entities. Digital public infrastructure should be used as an avenue to build digital health systems.

“Digital health has to be supported by a digital public infrastructure that ensures interoperability and meets all of the ecosystem’s diverse stakeholders.”

– Sameer Kanwar, Director of Digital Health, India & South Asia, PATH

Regional and ethnographic perspectives should be considered for designing and implementing effective digital health solutions.

When developing solutions, it is imperative for solution providers to prioritise the specific needs of the community, rather than pursuing one-size-fits-all approaches. Philanthropic efforts should emphasise close collaboration with communities, involving comprehensive ethnographic research to gain a deep understanding of local contexts. Insights gleaned

from this research should serve as the cornerstone for constructing effective solutions that resonate with the unique challenges and dynamics of the community. This approach ensures that solutions are not only relevant but also culturally sensitive and contextually appropriate, fostering greater impact and sustainability.

Figuring out the correct financial model is critical for de-risking and complementing capital investments across the value chain of solution development.

High reliance on venture capital funding is detrimental to the economic sustainability of solutions. Investors also find the medtech space risky, since digital health is still in its early stages of development. Therefore, de-risking investments through strategic partnerships with NGOs for non-financial support, and securing grant funding are essential to get investors on board.

Consideration of the diverse priorities between large investors and philanthropic foundations is crucial in the funding landscape. Grant funding can play a pivotal role in providing seed capital, supporting solution development, and establishing credibility, especially when engaging with larger investors.

In the impact funding realm, tools such as volume guarantees (the manufacturer commits to selling the product at or below the agreed price throughout the duration of the agreement, and pledges to produce a mutually agreed minimum volume of products for each year covered by the guarantee) and returnable grants can mitigate challenges stemming from substantial capital expenditure and restricted manufacturing volume, reducing per-unit costs. Conversely, smaller healthcare providers may grapple with higher expenses associated with digitalisation and change management. To tackle this issue, concessional loans or low-cost debts could be valuable solutions.³² Developers must take a balanced and effective approach to carefully evaluate and choose financing instruments that align with their specific needs and objectives.

“Impact investors need to figure out how to use innovative financing mechanisms to support digital health solutions for under-served populations. There is a huge opportunity for payment-by-results financing and blended structures in this space.”

– Steven Serneels, Co-Founder & Board Member, Iristick

Conclusion

The successful adoption of digital health solutions in the Global South necessitates a holistic approach across the entire continuum of care and not just the digitalisation of isolated components. It is crucial that interventions consider unique contexts and cultural nuances, emphasising equity in their implementation.

Prioritising a patient-centric approach, solution providers and innovators should exhibit flexibility and a readiness to embrace a multidisciplinary and collaborative strategy, to ensure the effectiveness and inclusivity of digital health initiatives.

While designing digital solutions, providers should also focus on systemic integration with current public health initiatives. The foundational elements of these solutions should prioritise interoperability, deployability in resource-limited settings, swift troubleshooting support, and robust governance to ensure contextual customisation, which would facilitate effective scaling up.

References

1. World Health Organization 2021, *Global strategy on digital health 2020-2025*.
2. Nesbitt, TS 2012, 'The Evolution of Telehealth: Where Have We Been and Where Are We Going?', National Academies Press.
3. Simpson, AT, Doarn, CR and Garber, SJ 2020, *A Brief History of NASA's Contributions to Telemedicine*, NASA.
4. Cory, N & Stevens P 2020, *Building a Global Framework for Digital Health Services in the Era of COVID-19*, Information Technology and Innovation Foundation.
5. Labrique, AB, Wadhvani, C, Williams, KA et al. 2018, *Best practices in scaling digital health in low and middle income countries*, Global Health.
6. Olu et al. 2019, 'How Can Digital Health Technologies Contribute to Sustainable Attainment of Universal Health Coverage in Africa? A Perspective', *Frontiers*.
7. Chueke 2023, *Penetration of Telemedicine and Telehealth in Latin American Hospitals*.
8. Precedence Research 2023, 'Digital Health Market Size, Growth, Trends, Report By 2032'.
9. Bode M, Goodrich T, Kimeu M, Okebukola P, & Wilson M, 2021, *Unlocking digital healthcare in lower- and middle-income countries*, McKinsey & Company.
10. Kapur V. & Boulton A., 2020, *Covid-19 Accelerates the Adoption of Telemedicine in Asia-Pacific Countries*, Bain and Company.
11. Muanya, C. 2019, *Advancing digital health in Nigeria*, The Guardian.
12. Statista Market Insights, n.d., *Digital Treatment & Care - South America*, last viewed on 16th November 2023.
13. Statista Market Insights, n.d., *Digital Treatment & Care - Africa*, last viewed on 16th November 2023.
14. Statista Market Insights, n.d., *Digital Treatment & Care - Asia*, last viewed on 16th November 2023.
15. Jousset O, Kimeu M, Müller T, Sforza G, Sun YS, Ustun A & Wilson M 2023, *How digital tools could boost efficiency in African health systems*, McKinsey & Company.
16. Gupta G., 2022, *The Changing Landscape of Digital Healthcare in India*, Healthworld Economic Times.
17. Bashir S., n.d., *Global Initiative on Digital Health*, World Health Organization.
18. Ibid, 15
19. Sethi M 2023, *Harness digital health for Universal Health Coverage*, World Health Organization.
20. Olusanya OA, White B., Melton CA, & Shaban-Nejad A 2022, 'Examining the Implementation of Digital Health to Strengthen the COVID-19 Pandemic Response and Recovery and Scale up Equitable Vaccine Access in African Countries', NIH.
21. Aldosari, Nasser et al. 2023, 'The Use of Digital Health by South Asian Communities: Scoping Review', *Journal of medical Internet research*.

22. Khetrpal Singh P & Landry M 2019, [Harnessing the potential of digital health in the WHO South-East Asia Region: sustaining what works, accelerating scale-up and innovating frontier technologies](#), WHO South East Asia J Public Health.
23. Ibid, 22
24. Ibid, 5
25. Mathauer I, Dale E, Jowett M, Kutzin J 2019, [Purchasing of health services for universal health coverage: How to make it more strategic?](#), World Health Organization.
26. Zaidi S, Das JK, Jamal W, et al., 2023, ['Government purchasing initiatives involving private providers in the Eastern Mediterranean Region: a systematic review of impact on health service utilisation'](#), BMJ Open.
27. Ibid, 26
28. Wellcome Trust 2017, [Avatar therapy: early trial results 'very encouraging'](#).
29. Siala H & Wang Y 2022, ['SHIFTing artificial intelligence to be responsible in healthcare: A systematic review'](#), Social Science & Medicine.
30. Ibid, 5
31. Nat Commun, 2022, [Challenges in digital medicine applications in under-resourced settings](#)
32. Ramasuri R., Rostrup D. & Chatterjee G., 2023, [How innovative finance can lower costs and boost demand for digital health solutions in the Global South](#), Impact Alpha.

