Harnessing the potential of digital health in the WHO South-East Asia Region: sustaining what works, accelerating scale-up and innovating frontier technologies

Digital health is in the news everywhere, and this complex field is expanding rapidly, with new innovations in all aspects of clinical medicine and public health emerging at lightning-fast speed. The World Health Organization (WHO) South-East Asia Region has been a notable hub of innovation and implementation in digital health, and this issue of the WHO South-East Asia Journal of Public Health focuses on exploring and reporting on progress to date. Digital health technologies are recognized as an essential enabling factor for achieving the region’s own Flagship Priority Programmes, as well as the ambitious “triple billion” targets outlined in the WHO Thirteenth General Programme of Work (2019–2023)1 – ensuring 1 billion more people benefit from universal health coverage, 1 billion more people are better protected from emergencies and 1 billion more people enjoy better health and well-being.

“The future of health care is digital”

WHO Director-General Tedros Adhanom Ghebreyesus2

The appropriate use of digital health offers exciting new opportunities to accelerate progress towards achieving universal health coverage and Sustainable Development Goal (SDG) 3,3 alongside other global, regional and national public health priorities. The application of digital solutions to health systems can help address constraints that have hindered the optimal delivery of equitable and high-quality care. For example, health workers are often burdened by paper-based ledger systems that require the manual tabulation of data for summary reporting – a cumbersome process that can inhibit service delivery. Progress on the core principles of universal health coverage – quality, coverage and affordability – is thus undermined by the very tools that health systems rely on to track needs, services and client outcomes.

The strategic implementation of digital technology reverses this situation. Automated processing can produce data for interpretation by health workers to support, monitor and inform health service improvements. The health sector has increasingly turned to digital technologies to help scale up and integrate efficacious public health interventions, rectify weaknesses in health system performance and empower individuals to become active participants in their health care. The number and scope of digital innovations, applications and services is vast, and these technologies address many priorities. Innovations include preventive services provided through basic SMS messaging and health apps on mobile phones; care and diagnostics using “smart” technology devices that share data; patient management using electronic medical records; public health initiatives using all types of data platforms and health information systems; and rapidly emerging innovations in the use of artificial intelligence, robotics and big data predictive analytics.

As the following pages demonstrate, despite significant financial and human resource constraints, countries in the WHO South-East Asia Region have shown considerable expertise and success in rapidly adopting, piloting and implementing a range of digital health solutions. The initiatives have focused on sustainable, locally serviceable and “frugal” innovations that are tailored to local needs and aimed at improving access to health care for all. Countries in the region have recognized the value in bottom-up, scalable and proven technologies that are driven by local innovators, and they have derived benefits from adopting and repurposing home-grown and open-source digital solutions that can be serviced, adapted and maintained by local partners. Bottom-up technology innovations consisting of affordable solutions, innovative business models and processes that facilitate health service delivery allow more people to benefit from socioeconomic development.

The WHO South-East Asia Region is sustaining and accelerating its innovative work on digital health to improve the health and well-being of the people. Boxes 1–3 illustrate just a few examples of how digital health technologies are progressing and having an impact across the region. Countless digital health solutions are being implemented, and lessons can be learnt from both what has worked and what has not.

Sustaining current investments and planning for the future

Advancing digital health sustainably with realistic and comprehensive strategies, plans and effective implementation has been challenging for all countries. In May 2018, the Seventy-first World Health Assembly adopted resolution WHA71.7 on digital health.4 The resolution urged Member States “to assess their use of digital technologies for health, including in health information systems at the national and subnational levels, in order to identify areas of improvement, and to prioritize, as appropriate, the development, evaluation, implementation, scale-up and greater utilization of digital technologies, as a means of promoting equitable, affordable and universal access to health for all, including the special needs of groups that are vulnerable in the context of digital health”. The implementation of resolution WHA71.7 should help Member States better harness the potential of digital health. The sustainable use of digital health technologies will be facilitated by developing sound policies and guidance,
implementing effective strategies and action plans, enabling good digital architectural design, and linking current and planned technologies and solutions to enable the frictionless exchange of information. Ten of the region’s eleven countries have digital health strategies, plans and architecture blueprints at various stages of development, revision and implementation. WHO has supported many of these efforts through the WHO—International Telecommunication Union (WHO-ITU) National eHealth strategy toolkit. Countries in the region are assessing which digital health solutions (i) are currently working effectively; (ii) have the capacity to be scaled up and sustained; and (iii) are sufficiently flexible to be linked together to promote interoperability. Use of the evidence accrued will be essential to inform plans and decisions such that future digital health expansions achieve the intended benefits.

**Box 1. Sustain and enhance what works**

The Democratic People’s Republic of Korea adopted telemedicine in 2010 and maintains a national eHealth centre. This facilitates digital consultations, enabling specialist doctors to advise on diagnosis and treatment for patients in remote areas who would otherwise have difficulty in accessing care. A telementoring system for surgery is available to all provincial, city and county hospitals.

Maldives has been using and sustaining the WHO South-East Asia Regional Office integrated data analysis system (SIDAS) since 2007 for case-based reporting of all notifiable diseases. Information, including reports received by fax and email, is recorded using a web-based electronic data entry system. SIDAS will be integrated with a digital health management information system platform, which has recently been launched and is under active development, with training rolled out to all stakeholders.

Sri Lanka has deployed and fully scaled up an electronic reproductive health management information system (eRHMIS), first introduced in 2016. This has resulted in complete, timely and high-quality data collection, analysis and use across Sri Lanka at all levels of the health system. Use of eRHMIS has facilitated the efforts that have ensured continued reductions in maternal and child mortality and improved island-wide reproductive, maternal, newborn, child and adolescent health service delivery.

Timor-Leste has harnessed and enhanced several digital health interventions that have worked well. These include the Liga Inan mHealth programme, which connects expectant mothers with health providers; the 2015 launch and ongoing use of a computer training lab supported by WHO within the Institute of Health Sciences; and learning labs to empower and train midwives.

**Accelerating scale-up of appropriate digital health interventions**

All too often, a “cutting-edge” digital health technology will be launched, and a pilot project started, only for the initiative to end in failure. While there are many reasons why these innovations do not succeed, several factors are common. For example, the intended users or beneficiaries may not have been consulted during the planning and design stages. Doing so would have ensured that the intervention was suitable and user-friendly from the outset. Likewise, while the technology may have appeared to work, its scale-up may have been too expensive, and maintenance may have been possible only with unrealistic levels of technical support. New technologies are therefore more likely to succeed if the blueprint is based on digital health interventions that the evidence suggests are effective or promising.

In April this year, the WHO guideline: recommendations on digital interventions for health systems strengthening was released based on a critical evaluation of the evidence on digital health interventions aimed at improving health systems. The guideline makes recommendations on a subset of 10 prioritized digital health interventions for which sufficient evidence is available on benefits, harms, acceptability, feasibility, resource use and equity considerations. The evidence is emerging rapidly, and subsequent versions of the guideline will therefore gradually cover a broader set of emerging digital health interventions.

It is recognized that the fast-moving nature of the field risks excluding health policy- and decision-makers without a background in informatics and that the lack of a “common language” may impede uptake. To remedy this situation, WHO has created a classification system that categorizes 83 discrete digital health interventions through which digital and mobile technologies are being used to support health system needs. The creation of this taxonomy aims to promote the use of language that will be accessible to health programme planners.

Many factors influence what is scalable and sustainable in digital health. In large part, there is adequate infrastructure – including electricity, internet connectivity and mobile phone coverage – in the region. There is typically at least one mobile phone available in each household or community, meaning applications or mobile apps can be used to deliver multiple health services in nearly any context or setting. The digital divide is narrowing, costs are reducing and the enabling environment is growing to underpin better, cheaper and faster digital health solutions that are fit for scale.

**Box 2. Accelerate and scale appropriate solutions**

Bangladesh has customized and taken to scale a large range of interoperable open-source technologies that have facilitated the collection and reporting of nationwide aggregate data and public health information, health facility management and electronic medical records. Another example is the deployment of the WHO Open Smart Register Platform (OpenSRP) to track mothers and their children from antenatal care to delivery of immunizations for the child. OpenSRP has helped streamline data collection and aggregation and has enabled instantaneous communication between health workers, thereby improving not only service delivery but also the reliability of national health indicators.

India has embraced the WHO-ITU Be he@lthy, be mobile initiative to roll out an mHealth tobacco cessation programme. The initiative was further scaled up with the launch of a second version of this programme, which delivers the content through text messages or interactive voice responses in 12 languages. To date, the programme
Innovating through disruptive and frontier digital technologies

The story of digital health in the WHO South-East Asia Region is not just one of adopting and adapting solutions from higher-income settings. Many countries are “leap-frogging” earlier, slower changes in digital health and moving directly to implementing novel solutions. Advances in robotics, the use of artificial intelligence, machine learning, big data analytics, blockchain technology – all of these frontier and disruptive innovations are potentially powerful tools to transform how health services are delivered and inefficiencies in health systems addressed. The onus is on countries to embrace innovation strategically while acknowledging that digital health is inherently dynamic and that new technologies that address present-day challenges could be just around the corner.

Box 3. Innovate and disrupt for effective change

**Bhutan** is taking an innovative digital approach to improving services for blood donation. The Blood4Life app for mobile phones was launched in 2018. It enables registered potential donors to receive blood donation requests; potential recipients can also log a request for blood. Registrants can view all blood donation camps and events. The app also shares motivational stories on the benefits of blood donation.

**Indonesia** is embracing artificial intelligence and preparing to initiate big data analytics using the enormous data sets associated with the national insurance programme, Jaminan Kesehatan Nasional (JKN), the ongoing longitudinal Indonesian Family Life Survey and other data sources on household health status. The data will be used to predict the future burden of diseases and to anticipate demands on the health system and JKN.

**Thailand** has been at the forefront of the development and use of medical robotics surgery, diagnosis, rehabilitation and services. Earlier this year, the ministries of science and technology, public health and education jointly set up a committee with a key responsibility to promote medical and health-related innovations. In addition, the award-winning Khon Kaen city smart health project includes innovations such as a smart ambulance, preventive health care through the use of wearable devices, and blockchain and big data analytics to develop a medical data-sharing platform.

**Conclusion**

Digital health professionals in the WHO South-East Asia Region are actively learning from each other through peer-to-peer knowledge exchange and technical assistance. This networking allows practitioners to address common issues around digital health governance, architecture, the use of standards and cost-effective implementation support. There are two major platforms for cross-country learning, sharing and collaboration across the region. The Asia eHealth Information Network, which was started by WHO in 2012, now has over 1200 members, mainly from government and academia. The Global Digital Health Partnership was launched in 2017 with several countries from the region and WHO as charter members. These initiatives provide opportunities for digital health professionals to work together to address common technical barriers and challenges.

Although the speed, levels of sophistication and services targeted may vary, all countries of the region are on a common pathway to improving health by exploiting the opportunities that new technologies bring. The Member States of the WHO South-East Asia Region are therefore poised to contribute to and benefit from the strategic objectives of the WHO Global strategy on digital health 2020–2024. At a regional consultation on digital health policy and practice in February 2019, common issues and challenges were identified. Countries recognized that strengthening capacity in many areas will be essential if complex digital health systems are to be deployed and sustained. Also clear was the critical importance of considering the perspectives and needs of the users and beneficiaries of digital health. Maintaining data security, privacy and confidentiality in the digital health sphere is a challenge all countries must address. Despite these challenges, the strong political support for digital health was clear.

Countries of the region can therefore learn much from one another. Crucially, these discussions cannot be limited to tech-savvy digital enthusiasts. The sharing of knowledge and good practices on how to use digital technologies to sustain, accelerate and innovate for better health needs to happen at all levels of the health system and within every cadre of the workforce involved in improving health – from community
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health workers to national policy-makers. The collection of papers featured in this issue of the journal will contribute to that process.

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References