




Creating digital first health systems with young people

● A collection of youth authored essays





In 2023, the Digital Transformation for Health Lab's (DTH-Lab) Regional Youth Champions (RYC) were invited to share a short essay on what a digital first health system means to them. In this collection of essays, seven RYC reflect on a special priority area affecting global health governance and how digital first health systems offer a promising way forward in improving the health and well-being of young people in a digital age.

This is the partnering document to the global report, [Building a blueprint for digital first health systems: Findings from global youth consultations.](#)

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Digital health and intersectionality: Ensuring equity and inclusion of marginalised youth



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Digital advances and integration have transformed industries by addressing many difficult-to-tackle problems. The healthcare industry is no exception; with the growing capabilities of digital tools, many countries are prioritizing their health systems to become digital first. However, marginalized youth are at risk of becoming increasingly disadvantaged by a digital first health system due to poorer accessibility and structural inequities.

There are both 'software' and 'hardware' factors contributing to inaccessibility. Marginalized youth have lower digital and health literacy, which are intangible 'software' gaps leading to lower utilization of digitally integrated healthcare. This requires a national approach to increase educational efforts catered to these underprivileged youth. On the other hand, digital infrastructure, the 'hardware', is lacking in many remote and marginalized communities, including internet connectivity and digital devices. Coordinated community efforts are required to construct the necessary infrastructure to ensure internet connection and affordable technology.

However, improved accessibility is only beneficial when the system itself is friendly for its users. Equity-seeking youth have poorer health outcomes due to structural inequities ranging from racism, ageism, sexism, ableism, to xenophobia and homophobia etc. Digital technologies will not magically solve these pre-existing issues in the system, but rather, risk amplifying them by creating a greater power

imbalance. Therefore, it is of utmost importance to prioritize and engage marginalized youth to not perpetuate factors contributing to their poorer health. To ensure the system is friendly to marginalized youth, a group of diverse youth should be consulted on the language and design of digital tools integrated into the health system. Health professionals with expertise in health equity and cultural sensitivity should also be involved in ensuring that the digital integrations minimize or eliminate biased algorithms that put equity-seeking youth at a disadvantage.

Lastly, confidentiality and privacy are crucial to gaining trust from youth. Youth growing up in a digital era have varied experiences, but overwhelmingly share the struggle of personal data exploitation by platforms and corporations. Unfortunately, the governance has not kept up with the pace of digital advances. In the context of digital first health systems, the consequences are dire without proper regulation to safeguard the personal health data of the users. Therefore, governments need to commit to accelerating regulatory efforts to better protect the public that they serve.

Digital first health systems should also be people first. Accessibility, inclusivity, and governance are all key components in creating an equitable digital first health system. Marginalized youth should not be an afterthought, and this starts with intentional steps towards bridging gaps through digital integration, rather than creating a larger divide.

Youth entrepreneurship: Redefining digital healthcare in emerging economies

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In the global pursuit of universal healthcare coverage, developing countries face complex and multifaceted challenges ranging from constrained resources to immature infrastructure. Amidst these hurdles, youth entrepreneurship emerges as a beacon of hope for spearheading the construction of digital health systems tailored to meet the unique needs of these nations.

In the Global South, where conventional healthcare systems struggle to reach remote rural areas and cater for marginalized communities, young entrepreneurs emerge as trailblazers. Their innovative spirit, technological aptitude and deep understanding of local challenges encourage them to conceive and implement tech-enhanced solutions that effectively bridge existing healthcare disparities.

Youth-led startups are the best at leveraging existing infrastructures creatively. By repurposing everyday devices like smartphones and utilizing low-bandwidth technologies, they can devise a spectrum of digital health solutions (from mHealth, telemedicine, and EHR platforms, to community-based healthcare models) which are accommodating the limitations of connectivity and resources in historically underserved communities. This adaptability ensures that innovations are not just technologically sophisticated but also practical and applicable within local contexts.

The journey of young digital health entrepreneurs is not without obstacles,

however. Limited access to capital funding and technological resources pose significant challenges, especially in for-profit ventures where sustainability is essential for continued innovation and impact. Additionally, digital literacy among clients and healthcare professionals, navigating complex regulatory and compliance frameworks, and establishing partnerships for scalability remain a daunting task for both nonprofit and for-profit HealthTech institutions led by young leaders.

In my country of Iraq, for example, young entrepreneurs are behind the first and only digital health initiatives present in the country, which mainly consist of telemedicine and EHR platforms. Iraq is overwhelmed with the major challenges of infrastructure disparities, data interoperability, regulatory framework limitations, and insufficient budget allocations which in turn handicap innovation in its healthcare system.

Therefore, we require a concerted effort from multiple stakeholders to foster youth-led digital health solutions. Governments need to create conducive regulatory environments and provide support mechanisms such as funding, mentorship and incubation spaces. Collaboration with private sectors, NGOs and international organizations becomes imperative to amplify the impact of these entrepreneurial endeavours.

Education plays a crucial role in nurturing a culture of innovation and entrepreneurship.

Integrating entrepreneurship education within medical curricula equips young medics with the skills and mindset necessary to identify healthcare gaps and design viable bridges. This approach not only cultivates future innovators but also empowers communities to take charge of their healthcare needs.

Investing in youth entrepreneurship in digital health is not merely an economical development initiative; it's an investment in sustainable, community-centric healthcare. By harnessing the untapped potential of youth, developing nations can leapfrog traditional healthcare barriers, offering

innovative, cost-effective, and scalable solutions that prioritize the health and well-being of their populations.

Finally, the convergence of youth entrepreneurship and digital innovation presents a formidable opportunity to revolutionize healthcare infrastructures in developing countries. By nurturing and empowering young innovators, we pave the way for a future where healthcare is not constrained by geographic boundaries but rather becomes a fundamental human right, accessible to all.

Digital literacy's central role in deploying effective digital first health systems

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A digital first health system, by definition, is centred around leveraging digital technologies to enhance the delivery of healthcare services, but sometimes ensuring that these systems are not only effective but also responsive to the diverse health needs of young people can be difficult.

Digital literacy can play a crucial role in addressing these challenges, particularly in equipping young people with the essential knowledge and understanding of how to navigate digital platforms like telehealth services and remote monitoring technologies, how to access and securely manage their health records online, and how to interpret and use health metrics and data and distinguish between evidence-based information and misinformation.

Digital literacy initiatives

Multiple good practices can help enhance digital literacy. These include collaborating with educational institutions to integrate digital health literacy into school curricula and ensuring that the learning process is not only informative but also fun for young people through gamification elements, quizzes, storytelling, arts and interactive activities that ignite interest and comprehension of digital health concepts.

Other good practices include developing and disseminating resources and publications tailored by and for young people, such as online guides and video tutorials, as well as harnessing

the power of social media to provide easily shareable content.

When engaging in collaboration with organizations or tech companies that lead the creation of these solutions, it is important to make sure that young people are included in the decision-making process from beginning to end.

For example, mental health apps like [BetterHelp](#) have successfully implemented this inclusive approach. By actively involving young users in the design and improvement process, BetterHelp was able to gather valuable feedback from young people with diverse mental health needs ensuring that the app is refined to cater to a broad range of experiences, ultimately enhancing the effectiveness and user satisfaction.

Digital divide and health inequality

One of the biggest challenges related to digital literacy is accessibility and internet connectivity, especially for young people from developing countries. While progress has been made, a significant digital divide still exists, and millions of young people either have limited or no access to the internet.

Addressing this digital disparity is not only a matter of technological inclusion but also a fundamental step toward promoting digital literacy and equity in health outcomes. Parties working on this issue should focus on

implementing affordable internet solutions, expanding digital infrastructure and fostering digital literacy as they are essential components of a comprehensive strategy aimed at reducing the pervasive impact of this digital divide.

Initiatives like UNICEF and ITU's Giga, have taken proactive steps to bridge the digital divide, focusing on connecting every school to the internet and every young person to information, opportunity and choice.

In conclusion, as the digital healthcare system continues to evolve, fostering digital literacy among young people becomes increasingly important. Informed individuals are better equipped and more likely to collaborate with healthcare professionals, sharing insights that can significantly impact the course of their treatment.

Empowering communities: A digital first health system approach to pandemic preparedness through citizen science



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In the changing world of global health, health security threats persist even for the most advanced healthcare systems. Southeast Asia in particular, a region with rapid population growth and dense human-animal coexistence, faces continual risks from outbreaks and public health emergencies related to emerging infectious diseases (EID), natural hazards and unsafe food and water ([World Health Organization, 2017](#)). The majority of EIDs originate in animals and the risk of these pathogens spilling over from animals to humans is predicted to be highest in tropical regions including Southeast Asia as illustrated in Figure 1 ([Allen et al., 2017](#)). Recognizing the need to prevent these emerging diseases and potential pandemics becomes paramount in the context of the Southeast Asia region's growth.

In the face of global health crises like the COVID-19 pandemic, traditional healthcare systems have been put to the test, highlighting both strengths and weaknesses. The pandemic has emphasized the necessity for a more dynamic and transformative healthcare system, making it imperative to explore innovative approaches that empower communities to actively participate in pandemic preparedness.

As health systems increasingly shift towards a digital first paradigm, there is a unique opportunity to strengthen these systems and make future approaches more inclusive. The integration of digital technologies not only facilitates the efficient delivery of healthcare services but also opens avenues for citizen

engagement and empowerment in unprecedented ways. This transformative shift towards digital health systems offers a promising avenue for creating more resilient and responsive healthcare infrastructures. In this context, one innovative approach that holds great potential is the integration of a digital first health system with the principles of citizen science. By harnessing the power of digital platforms, mobile applications and data analytics, citizens can actively contribute to disease monitoring, contact tracing and the dissemination of vital health information. This participatory model not only enhances the speed and accuracy of data collection but also fosters a sense of community responsibility and involvement in public health initiatives.

Citizen science involves the active involvement of ordinary people in scientific research. Integrating citizen science into healthcare not only democratizes the research process but also taps into the collective intelligence of diverse communities. Engaging citizens as contributors rather than passive recipients of healthcare services encourages a sense of ownership and fosters a culture of shared responsibility for public health outcomes. ([Varga et al., 2023](#))

This combination approach addresses not only infectious diseases but also One Health challenges posed by zoonotic diseases, climate effects, antibiotic resistance, food safety, food security and many more. A digital first health system utilises technology to enhance accessibility, communication and data-driven

decision-making. This approach goes beyond geographical boundaries, facilitating a uniform exchange of information among healthcare providers, policymakers and citizens. It positions communities as equal contributors to the preservation of public health.

In terms of tackling emerging infectious diseases, a digital first health system provides a platform for early detection. Imagine this: a farmer in a remote village notices something off about his livestock and with a few taps on his phone, he reports it to health authorities and informs his neighbouring farms. Early detection of unusual cases is a critical component of a surveillance system and this is a good example of the power of a connected community. By intertwining citizen science, where locals actively participate in disease surveillance, we create a dynamic defence against outbreaks before they hit the headlines.

Fundamental to this approach is data transparency, building trust between communities and healthcare authorities.

Transparent data sharing facilitates informed decision-making, empowering communities to proactively mitigate pandemic impacts. It strengthens the feedback loop between citizens and health professionals, fostering a continuous learning environment.

However, challenges exist. Privacy concerns, data equity, digital literacy gap and ensuring equal access to technology must be addressed collaboratively by governments, healthcare organizations and technology developers. Overcoming these hurdles is essential for creating an inclusive and equitable digital first health system.

In conclusion, empowering communities through a digital first health system and citizen science transforms pandemic preparedness. By harnessing technology and community engagement, we can establish a resilient health system in the context of pandemic preparedness. Acknowledging the collective responsibility for community health is imperative as we contemplate the future of healthcare.

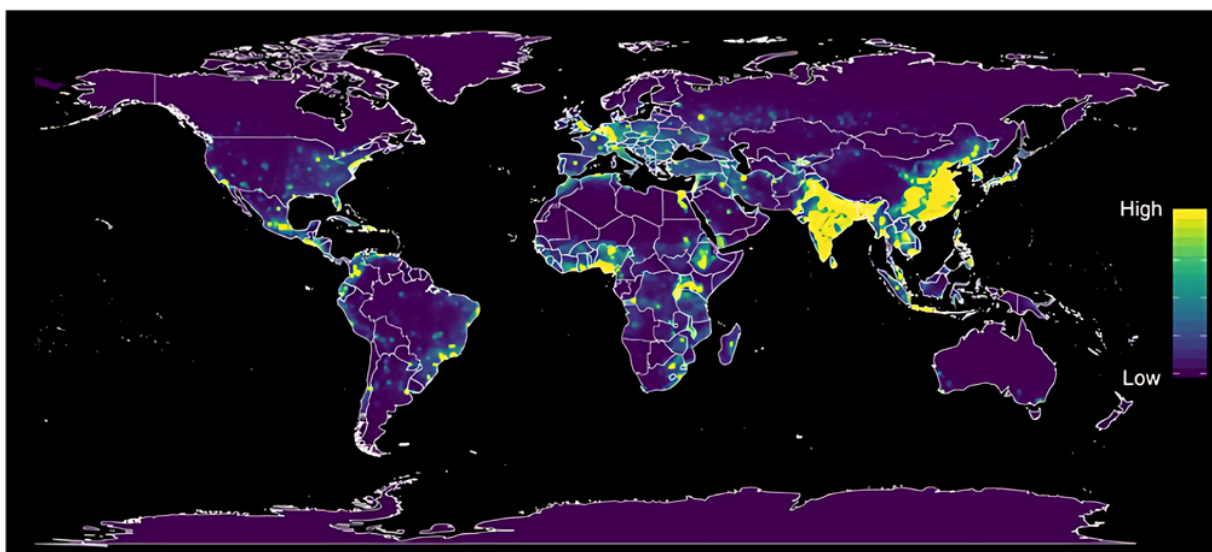


Figure 1: The predicted relative risk distribution of zoonotic emerging infectious disease events adopted from (Allen et al., 2017)

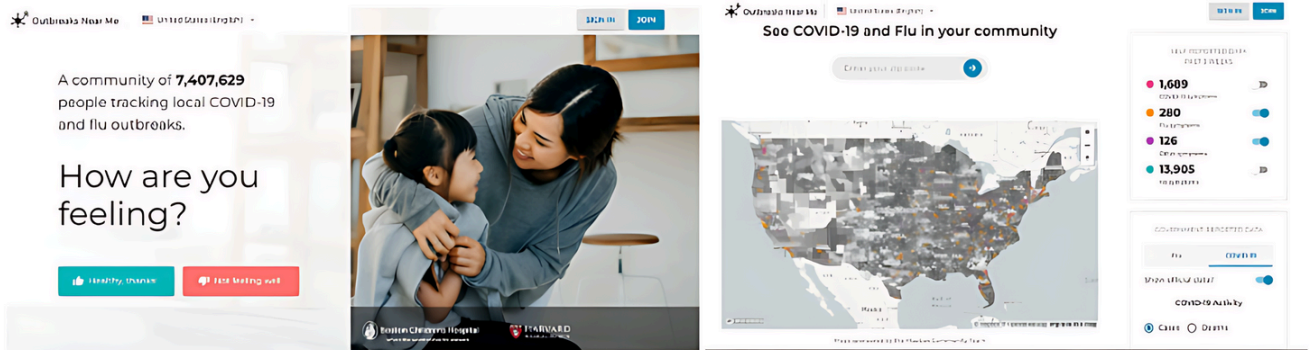


Figure 2: An example of citizen science using digital tools: Outbreaks Near me

Empowering tomorrow's health: The transformative potential of digital first health systems in boosting health literacy



Caroline Knop

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Digital first health systems will revolutionize the way our healthcare system works. This revolution will not only be a revolution of technology, systems and efficiency, but most importantly: a knowledge revolution. Digital first health systems designed right, have the incredible potential to serve as catalysts for enhanced health literacy. By placing reliable, high-quality health information at the forefront and actively involving patients in their healthcare journey, these systems can pave the way for a new era of informed well-being.

Empowering individuals to actively engage in their healthcare through clinical support for self-management is a key component. A comprehensive online platform should be created which integrates electronic patient records and provides an overview of upcoming health check-ups, doctor appointments and necessary vaccination boosters. Services like digital prescriptions, online pharmacies, remote consultations and online booking of in-person appointments can contribute to making healthcare management more accessible and convenient. Imaging results such as MRI scans, x-rays and CT images must be easily accessible and transferable to other healthcare providers, fostering collaborative and timely decision-making. Furthermore, digital first health systems have the potential to bridge the gap between complex medical language and patient understanding. Drawing inspiration from platforms like the German website "[Was hab' ich?](#)", online applications could translate intricate doctor's letters into understandable words.

Knowledge platforms should extend beyond medical records, offering trustworthy information about disease management, healthy lifestyles and habits. Gamifying aspects of medical treatment, nutrition and exercise planning can make health education engaging and interactive. AI applications trained on reliable sources can address user queries, providing evidence-based information and guidance tailored to individual needs.

Digital first health systems should incorporate monitoring tools for various health parameters. Integration with wearables, such as smartwatches and fitness trackers, enables real-time monitoring of vital signs. Apps monitoring oxygen levels, heart rate and mental health status empower users to actively manage their health. This data can be analysed by AI applications to identify anomalies, prompting automated alerts and suggesting appointments with healthcare professionals when necessary.

Governments play a vital role in this transformation by investing in secure platforms built with a bottom-up approach that considers the diverse needs of society. User-friendly and intuitive design, multilingual support and accessibility features cater to a broad demographic, including marginalized populations. Customization options based on gender, race, age and disabilities should further ensure inclusivity.

As Germany moves towards the mandatory electronic patient record by the end of 2024,

it is evident that the evolution of healthcare is underway. While existing applications and initiatives show promise, there is a need for a more centralized approach that addresses the multifaceted aspects of healthcare management.

The knowledge revolution brought about by digital first health systems can be a driving force for empowering individuals,

promoting health literacy and fostering a proactive approach to well-being. Governments, healthcare providers and technology developers must collaborate to ensure that these systems are accessible, user-friendly and inclusive, thereby realizing the full potential of a transformed healthcare landscape.

Sexual and reproductive health and rights and digital health



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Regional Youth Champion for Sub-Saharan Africa

Digital technology has become an essential tool for global health development, with tremendous potential for accelerating access to health outcomes and information, including access to Sexual and Reproductive Health and Rights (SRHR) for adolescents and young people in Africa. Since the COVID-19 pandemic, some African countries have embraced and leveraged technology such as mobile phones and the internet to create awareness and amplify health information in Africa. Young people in Africa continue to experience unmet needs, including SRHR information and services, HIV/AIDS, contraceptives/pregnancy prevention and other sexually transmitted infections.

Digital health information in the context of SRHR plays a crucial role in reaching and informing diverse populations, especially those who may have limited access to traditional healthcare services. Digital health has empowered young people with information to make informed decisions about their sexual and reproductive health and connect them with relevant resources and support where necessary. Kemisola Bolarinwa, a Nigerian, developed a “[Smart Bra](#)” that can detect breast cancer in an early stage, potentially saving African women long journeys to access screening services, thus saving them time.

In this current era, where technological tools have advanced rapidly, the intersection between digital technology and advocacy for SRHR has become increasingly pivotal. Young

people will no longer face stigmatisation when procuring contraceptives: the integration of digital tools has not only transformed communication but has also played a significant role in amplifying and advancing groundbreaking discussions around SRHR in Africa. Leveraging innovative approaches that break down traditional boundaries and foster positive regional change. Furthermore, ethically designed artificial intelligence (AI) can improve health services and healthcare delivery worldwide. For example, AI could help young people better control their health by bridging gaps in access to sex education by providing timely, accurate, personalised and confidential answers to SRHR questions. This is a game-changer, especially in settings where these issues are still taboo.

Access to comprehensive reproductive healthcare services in Africa is essential as it empowers women and young people to make informed decisions regarding when to be sexually active, contraceptive use, menstruation, growth and development. It plays a vital role in promoting sexually healthy lifestyles and preventing sexually transmitted diseases.

Digital transformations in SRHR advocacies in Africa

Over the decade, there has been a high number of maternal deaths and teenage pregnancies in Africa, which reflects inadequate access to healthcare services and information as a result

of gender inequality. The leading drivers of these concerns include poverty and lack of relevant information, among other factors that have led to unintended pregnancies, restricted access to contraceptives/family planning and denied access to affordable, safe abortion services and quality post-abortion care.

Digital technology has significantly impacted SRHR advocacies in Africa, enabling them to reach a wider audience, disseminate accurate information, improve access to services and amplify marginalized voices through social media, mobile apps and online platforms. Some of these platforms include [Frisky by EVA](#), [The Health City Online](#), and [iCareSRHR](#), which provide SRHR information to young people and access to services in Africa.

Integrating SRHR platforms into national health systems in Sub-Saharan Africa is a complex issue with varying levels of progress and challenges across different countries. While some countries have made significant strides in working towards integration, others are still in the early stages of implementation or facing barriers to integration. Overall, the integration of digital SRHR platforms into national health systems in Africa has the potential to transform the delivery of SRHR services and improve health delivery outcomes.

Data science and research For digital health technologies



Philip Injendi Yauma

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As a Regional Youth Champion (RYC) based in Nairobi, Kenya, focusing on data science and research for digital health technologies, I am eager to delve into the imperative of developing a digital first health system tailored to the needs of young people in Sub-Saharan Africa.

Defining digital first in youth health

In the context of Sub-Saharan Africa, a digital first health system means leveraging technology to address the specific health concerns of youth. My primary focus area is mental health, recognizing its growing significance among the youth in this region.

Customized solutions for youth needs

A digital first health system should prioritize mental health support, offering user-friendly applications providing resources, counselling services, and personalized interventions. Accessibility is crucial, especially considering the diverse socio-economic backgrounds prevalent in the region.

Investments for success

Successful implementation requires substantial investments at both national and community levels. Financial resources are essential for developing and maintaining robust technological infrastructure, ensuring seamless connectivity. Simultaneously, investing in human resources, including training healthcare professionals and

community health workers, is vital for effective utilization and outreach.

Transforming sub-Saharan Africa's health systems

Sub-Saharan Africa is undergoing a transformative shift toward digital first health systems. Telemedicine, mobile health apps and data-driven strategies are being adopted to enhance healthcare delivery. Strengths lie in improved accessibility to remote areas and efficient healthcare delivery. Challenges include inadequate infrastructure, limited digital literacy and disparities in technology access.

Navigating strengths and weaknesses

Digital transformation's strengths in Sub-Saharan Africa include bridging healthcare gaps, especially in rural areas, through initiatives like telemedicine. However, weaknesses such as the digital divide and cybersecurity concerns must be addressed. Collaborative efforts are essential to ensure equitable access and safeguard sensitive health information.

Achieving a digital first health system requires tailoring solutions to the unique needs of young people. Prioritizing mental health, ensuring accessibility and addressing challenges specific to Sub-Saharan Africa are key. Success demands strategic investments in financial and human resources, coupled with an understanding of transformational strengths and weaknesses.

As RYC, I am committed to contributing to this dialogue, fostering collaboration and advocating for policies prioritizing the digital well-being of Sub-Saharan Africa's youth.

Through collective action, we can pave the way for a future where digital health technologies catalyse positive change in healthcare delivery for the benefit of all.



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