Building a blueprint for digital first health systems

Findings from global youth consultations

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Executive summary

Digital Transformations for Health Lab (DTH-Lab) is collaborating with young people around the world to develop a **blueprint for digital first health systems**. This blueprint will set out young people's vision for digital first health systems and guide different actors – from policy makers to technology companies – on the steps required to make this vision a reality.

DTH-Lab's work builds on the report of *The Lancet* and *Financial Times* Commission on Governing health futures 2030: Growing up in a digital world. The Commission recommended that for young people's health and well-being to thrive in an age of digital transformations, stakeholders must enfranchise and empower youth to co-design and critically engage with digital first health systems as part of efforts to increase public participation and digital citizenship for health.

This global interim report summarizes the first stage of a three-year project to develop the blueprint. Over nearly a year and a half long process, more than 100 young people under 30 years old from 36 countries were consulted through a social media campaign, call for essays and series of six virtual consultations with global youth networks.

The many rich and diverse contributions make clear that young people know what kind of health futures they want to see, they have expectations of what an equitable digital first health system can achieve, and they want to be actively involved in co-creating the solutions.

For young people's health and well-being to thrive in an age of digital transformations, stakeholders must enfranchise and empower youth to co-design and critically engage with digital first health systems

Global youth priorities for digital first health systems

Principles and values that must underpin digital first health systems

Youth around the world are strongly aligned on the importance of a human rights-based approach and the fundamental values and principles that should shape the design and governance of any digital first health system.

Five core values are considered to be essential to any digital first health system. Young people want their health systems to be: **equitable, trustworthy, humanistic, ethical and inclusive.**

Health issues that a digital first health system should address

Young people want digital first health systems to be effective at predicting and preventing future physical and mental health challenges, as well as supporting young people to promote and manage their health and well-being.

According to youth, digital first health systems need to be designed to address: mental health; fitness and nutrition; sexual and reproductive health; climate-related health issues and non-communicable diseases.

Essential design features to enable a digital first health system to support young people's health and well-being

Young people want high quality personalized health services, delivered through user friendly tools. Digital first health systems should also equip everyone with the knowledge and skills required to make best use of digital health solutions and become confident digital health citizens.

Young people's preferred features for a digital first health system are grouped into four broad categories:

- Knowledge building
- Quality personalized services
- User-friendly tools
- Everyone (inter)connected

Promising tech solutions

Young people imagined many ways for new digital technologies to be integrated into their healthcare journeys but also want to see existing digital health solutions adapted and scaled up so that more people can benefit from them.

The kinds of tech solutions that young people were especially excited about are:

- Digital wearables
- Virtual interactions
- Automation
- Discreet devices
- Tech implants
- Decision support software

Barriers to realizing young people's vision for digital first health systems

Overall, participants felt confident that their digital first health systems could become a reality by 2045. However, they identified many significant barriers that need to be urgently addressed including:

- Weak data governance
- Digital divides
- Under-equipped health workforce
- Fragmented digital health services
- Low political will

Introduction

Digital technologies and data have become fundamental tools for health promotion, enhancing healthcare delivery and improving health outcomes globally. Countries at all stages of economic development and digital maturity are exploring ways to build or strengthen equitable digital first health systems that effectively respond to the health needs of their populations and support their paths to universal health coverage. Lower-income countries with weak health infrastructure and/or acute shortages of health workers are effectively leveraging digital health solutions to expand essential health services to underserved communities. (Olu *et al.,* 2019*)*

As part of their inputs into *The Lancet* and *Financial Times* Commission on Governing Health Futures 2030's (hereon Governing Health Futures 2030) report, young people communicated concerns about the lack of opportunities available to them to meaningfully shape their health futures and build health systems that respond to their needs and priorities. (Wong *et al.,* 2021) The Commission therefore recommended that for young people's health and well-being to thrive in an age of digital transformations, policymakers and other stakeholders must enfranchise and empower young people to co-design and critically engage with digital first health systems as part of efforts to increase public participation and build digital health citizenship. (Kickbusch *et al.*, 2021)

To take forward this recommendation, DTH-Lab is collaborating with young people from across the world to **develop a blueprint for digital first health systems**. The blueprint aims to set out young people's collective vision for equitable digital first health systems that respond to their diverse health needs and priorities. The blueprint will guide stakeholders – from policy makers to technology companies – on the steps required to realize this vision.

> Aiming to understand young people's hopes and concerns about digital transformations of health, and to identify common trends of what an ideal digital first health system might look like for young people across the world, this report introduces the concept of digital first health systems and why youth must play a central role in the co-design process. This report presents the key findings from the first phase of activities to build a blueprint, describes the diverse range of methods used and outlines the next steps for the project.

Background: Young people's health and views on digital transformations

The concept of a digital first health system (see Box on page 8) is relatively new and, to our knowledge, there have been no previous attempts to consult young people on how such health systems should be designed and governed. However, previous research and consultations carried out by the Governing Health Futures 2030 Commission and other organizations offer valuable insights into young people's health priorities, their views about the digital transformation of health systems and specific digital health solutions, as well as what digital transformations might mean for their health, well-being and rights.

Whilst young people's individual health needs vary considerably, on average, youth face different health risks and seek different kinds of health services and support compared to younger children and older adults. Injuries, mental health disorders and maternal health conditions are among the leading causes of death and disability among adolescents and youth aged between 10 and 24 years. (World Health Organization, 2023) On a day-to-day basis, young people tend to prioritize preventative care and maintaining healthy lifestyles, and are often characterized as being more health-conscious than earlier generations. (International Food Information Council, 2018) They value a holistic approach to health and well-being that addresses determinants of health such as poverty, education and housing. (World Health Organization, 2023) Learning, education and skills, and a safe and supportive environment have been identified by youth as top priorities for their future well-being. (Partnership for Maternal Newborn and Child Health, 2023)

In a survey of 23,000 young people conducted by the Governing Health Futures 2030 Commission and UNICEF, 88% of respondents reported that they already use some form of digital technology to support their health and well-being. Fitness was found to be the most popular health-related purpose for users of digital technologies (Governing Health Futures 2030 Commission, 2021). Young people believe they could benefit greatly from digital health, yet they often feel excluded or less prioritized in the consultation, content development, and design of digital health interventions. (Transform Health, 2022)

Public health services are often criticized by adolescents and youth for not being responsive to their needs. (Hargreaves *et al,*. 2012) Many youth report that they do not use health services due to fear of stigma, discrimination, lack of health workers, and high out-of-pocket costs (World Health Organization, 2019). An inability to seek medical assistance autonomously deters young people from getting help in a safe and private manner. Young people have expressed the need for a health system that provides youth-friendly support in a non-judgemental manner, while safeguarding their confidentiality. (Walker and Reibel, 2014)

What is a digital first health system?

A digital first health system is one where digital channels and platforms serve as a users' first point of contact, or initial entry point, into a healthcare system. In a digital first health system, digital technologies and data are primary and foundational elements of health promotion, prevention and healthcare delivery. A digital first health system can expand the traditional framing of a health system towards a broader ecosystem of interconnected tools and services to fulfil a variety of health and well-being needs.

Digital solutions offer benefits for both users and healthcare professionals because of their potential to improve health system accessibility, outcomes and efficiency. Instead of travelling to a health facility for a face-to-face medical appointment, a digital first health system allows an individual to access a range of personalized health services and health information from any location through digital tools and platforms. These include virtual consultations with healthcare professionals, online patient support groups, wearable sensors to monitor vital signs, and AI-assisted health information tools. Public health authorities can share timely and targeted prevention and health promotion messages and tools directly with individuals via their mobile phones and social media platforms.

A unique feature of digital first health systems is the range of opportunities available for social connectivity and community building. Digital platforms and tools can not only facilitate more regular two-way communication with health professionals, but they also provide access to wider online communities that offer social support, empowerment and a sense of belonging. Digital first does not mean digital only: a digital first health system can also include hybrid elements (blended digital and non-digital methods of care) and enhance important non-digital aspects of care and support.

Digital environments can – if designed and used appropriately – provide a safe and confidential space for youth to seek health advice and overcome some of their priority health concerns. Half of the respondents to the Governing Health Futures 2030/ UNICEF survey thought that accessing health information was the biggest way that digital technologies can help young people manage their health and well-being, yet inaccurate health information was also young people's biggest concern about digital health solutions, followed by concerns about their privacy, and use of digital technologies contributing to poor health, for example by making them less physically active.

Overcoming potential drawbacks of digital first health systems

Digital first health systems aim to harness the transformative potential of digital technologies to create more responsive, user-centered and efficient healthcare ecosystems. Whilst digital first health systems offer advantages for both individualized healthcare and wider health systems, these benefits are yet to be fully realized. Particularly in low- and middle-income countries, divides in access to and effective use of digital health technologies, coupled with uneven levels of digital health literacy and weak governance, are exacerbating health inequalities and risk undermining people's trust in digital health solutions. (Kickbusch *et al.*, 2021)

More inclusive approaches to health system governance can address many of the potential drawbacks of digital first health systems by ensuring that their design and implementation is people-centred, participatory and equitable. By actively involving marginalized and under-represented groups in the design and governance of health systems, inclusive approaches can help mitigate the impact of universal or biased policies that may disproportionately affect different groups, build trust and improve access to healthcare services, ultimately reducing health disparities.

Why youth must play a central role in co-designing digital first health systems

The importance of including and institutionalizing youth participation in both digital and non-digital health programmes is being recognized by policymakers. For example, WHO guidance on youth-centred digital health interventions recommends the meaningful and sustainable involvement of young people at every stage of the design and implementation process. (World Health Organization, 2021) Young people are eager to see such recommendations put into practice.

Growing up in an era of significant digital transformation, today's youth have different expectations of health systems – and the role of technologies in those systems – compared to older populations. Young people's expectations and experiences of digital transformations vary within and between countries. However, in general, those who access the internet and use devices such as smartphones at an early age are proficient at leveraging a range of digital health technologies, such as apps and wearables, to monitor and manage their health. Digitally-connected youth also proactively use social media and other digital platforms to seek

health information, connect to others to share lived experiences and emotional support, as well as to produce health promoting content of their own. (Lupton, 2021) In parallel, young people's overall experiences of digital environments and datification are impacting their health and well-being in both positive and negative ways. (Holly *et al.*, 2023)

Investing in young people's health will accelerate progress towards universal health coverage. (World Health Organization, 2019) However, since adolescents and youth are often perceived as a healthy cohort, their health services are given lower priority by policymakers and funders (Goodburn and Ross, 2000). In lower-and-middle income countries where up to 45% of young people can face difficulties in accessing services, this is a large population that is currently underserved. (UNICEF, 2023) As health systems become increasingly digital first, these systems must not only respond to the needs and expectations of today's 1.8 billion young people aged 10–24 but also anticipate and adapt to address future health-related benefits and risks of digital transformations.

Co-creating a digital first health system with youth is not about creating a health system only for young people but rather a system where adults and youth actively work together as co-creators, leveraging the unique experiences and contributions of different generations. By involving youth, stakeholders can also design health systems that are fit for all with specific health services available to address young people's unique health needs. More inclusive design and accountability processes can improve desired health outcomes for everyone while simultaneously improving the sustainability of the healthy system for generations to come.

Methodology: Garnering youth insight on digital first health systems

Conceptualizing digital first health systems with young people

In the year following the publication of the Governing Health Futures 2030 report, young people participated in translating the Commission's recommendations into action through advocacy and dissemination of the report's findings. This included taking forward recommendations to enfranchise young people and other under-represented communities in the co-design and implementation of digitally transformed health systems.

On International Youth Day 2022, the GHFutures2030 Youth Network launched the #MyHealthFutures campaign, aimed at creating space for young people under 35 years to share their hopes, concerns and ideas for improving health futures. During the campaign, young people were invited to share responses to the questions: "What does a digital first health system mean to you?" and "How could a system deliver better health futures for young people?".

Through this campaign, youth shared their insights through various channels including social media platforms, online polls and two calls for essays. Fourteen essays were submitted from authors aged under 30 from 11 countries (see Annex 1).

Futures thinking with global youth networks

To have more in-depth discussions with young people about their ideal digital first health systems, virtual consultative workshops were organized in partnership with five global youth networks focused on global health and digital transformations: One Young World, Young Experts: Tech 4 Health, AI Future Lab, the International Federation of Medical Students' Associations (IFMSA) and two cohorts of Governing Health Futures/DTH-Lab Regional Youth Champions.

Youth were invited to participate in 90 minute workshops on a virtual conferencing site (Zoom), which consisted of interactive sessions and tools ranging from polls, breakout rooms, virtual whiteboards and plenaries. The methodology for the workshops incorporated future-thinking tools and approaches to encourage young people to think beyond current realities and constraints. Ahead of these sessions, participants were asked to imagine what their ideal digital first health system would look like in the year 2045 (this year being chosen because it is around one generation in the future).

The global consultations, held between September 2022 and January 2024, **brought together 97 young professionals under 30 from 36 countries across all regions of the world.**

During the session, participants were asked to consider the following questions with the year 2045 in their mind:

1. What are young people's **biggest health priorities** likely to be?
2. What **principles or values** have been embedded in digital first health systems?
3. What **essential design features** are in place to enable the digital first health system to support young people's health and well-being?
4. If you could time travel, what kind of **artefact** would you bring back to the present that symbolizes a digital first health system in 2045?
5. What are some **risks and challenges** arising from digital first health systems that you hope would get addressed by 2045?
6. How **confident** are you about digital first health systems becoming a reality by 2045?

Participants' inputs and ideas were collated from each workshop through various mediums including virtual whiteboards, online polls and written notes taken by assigned rapporteurs. Inputs from all six workshops were compiled and grouped into themes.

The global consultations brought diverse groups of young professionals together from all regions of the world. In total, six consultations were held between September 2022 and January 2024 involving 97 young people under 30 years old from 36 countries (see Annex 2 for participant information).

Key findings

Ideas and themes shared through the workshops, essays and other channels were fairly consistent, indicating that young people have many common expectations of their future health system, regardless of the context they are coming from. Although each participant holds a unique lived experience, a general consensus arose on the values, features and health issue areas that need to be considered when designing an ideal digital first health system that meets the needs of young people.

"AI could help young people better control their health 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."

Lydia Gara

Regional Youth Champion sub-Saharan Africa (2023–2024), DTH-Lab

Health priority areas that a digital first health system should address

Workshop participants highlighted five health issues that they believe will be of greatest priority to youth globally in the year 2045 and that digital health systems need to be designed to address: mental health; fitness and nutrition; sexual and reproductive health; climate-related health issues; and non-communicable diseases. These are the same issues that concern youth today with mental health and sexual and reproductive health, in particular, being highlighted as priority issues in several youth essays as well as other global consultations. (World Health Organization, 2023)

Beyond addressing specific health priority areas, youth also indicated that a digital first health system should be effective at predicting and preventing future physical and mental health challenges, including building resilience against pandemics, as well as promoting ways for young people to stay as healthy as possible.

46%
Fitness and Nutrition

● **10.5%**
Infectious Diseases
(HIV, Coronavirus, etc.)

39.5%
Sexual and Reproductive Health

75%
Mental Health

53.5%
Climate-related Health Issues

Non-Communicable Diseases **46.5%**

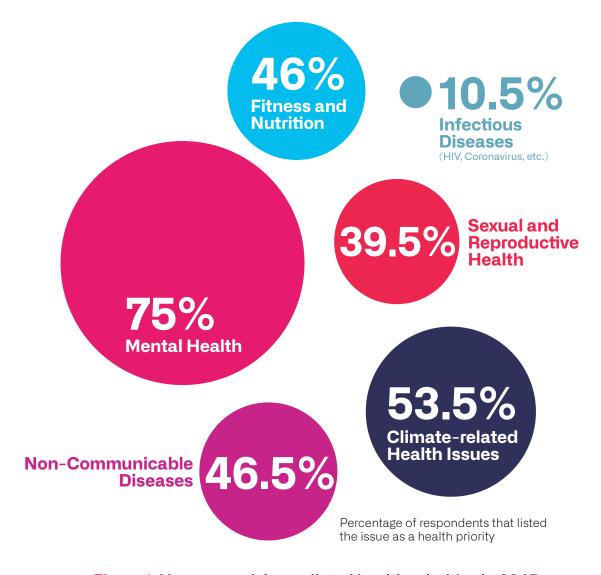Percentage of respondents that listed the issue as a health priority

Figure 1: Young people's predicted health priorities in 2045

Core values and principles that should underpin a digital first health system

Human Rights
based approach to digital first health systems

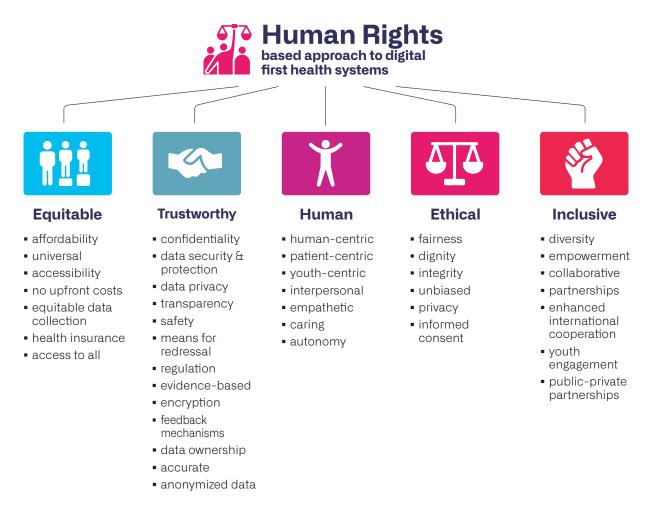| Equitable	Trustworthy	Human	Ethical	Inclusive
▪ affordability ▪ universal ▪ accessibility ▪ no upfront costs ▪ equitable data collection ▪ health insurance ▪ access to all	▪ confidentiality ▪ data security & protection ▪ data privacy ▪ transparency ▪ safety ▪ means for redressal ▪ regulation ▪ evidence-based ▪ encryption ▪ feedback mechanisms ▪ data ownership ▪ accurate ▪ anonymized data	▪ human-centric ▪ patient-centric ▪ youth-centric ▪ interpersonal ▪ empathetic ▪ caring ▪ autonomy	▪ fairness ▪ dignity ▪ integrity ▪ unbiased ▪ privacy ▪ informed consent	▪ diversity ▪ empowerment ▪ collaborative ▪ partnerships ▪ enhanced international cooperation ▪ youth engagement ▪ public-private partnerships

Figure 2: Essential values for a digital first health system

Across all six consultations, participants agreed on the fundamental values and principles that should shape the design and governance of any digital first health system. There was a strong consensus that a **human rights-based approach** to digital first health systems is essential for promoting and protecting their right to health and addressing health inequalities. A human rights-based approach to health allows youth and others in their communities to be recognized as rights-holders and involves holding governments and other duty bearers accountable for realizing universally agreed norms and legal obligations.

Five core values are considered to be essential to any digital first health system. Young people want their health systems to be: **equitable, trustworthy, humanistic, ethical and inclusive.**

Equitable: A very strong recommendation from youth is that they want digital first health systems to make health services and health outcomes more equitable. Youth demand that digital innovations improve healthcare accessibility for underserved or marginalized groups, including people with disabilities. Moreover, these services must be affordable and covered by national insurance programmes.

Trustworthy: A trustworthy digital first health system is absolute. Young people need to trust the health system not only because their personal health information and data will be shared but also because the system will not be used effectively if this value is not adhered to by all stakeholders. Transparency about how information is being used and decisions are made is key to building trust. Young people also want to see stronger legal and regulatory frameworks in place for data and digital technologies so they can be assured that digital health services are effective and safe and that their data is not being misused.

Humanistic: Young people noted that certain non-digital elements of a health system are essential to the human experience and therefore must be retained. For example, they expressed a desire for health services to be provided in a caring and empathetic way and wanted to see technology augment, rather than replace, personal connections and non-technological aspects of healthcare. Services provided by the health systems must be based on the human factor meaning they are user or patient-centred. Digital first health systems and digital transformations of health more broadly must prioritize the health needs of the public and not always assume that digital solutions are the best option.

Ethical: Participants discussed many of the ethical issues faced by the integration of health technologies, such as concerns around privacy, data protection, exclusion, discrimination and bias. Ethical considerations are essential for young people to ensure that digital first health systems are developed and used in a way that respects the rights and dignity of patients, healthcare providers, and other stakeholders.

Inclusive: Meaningful involvement of young people from different backgrounds in the design and governance of digital first health systems was deemed to be essential for ensuring that systems are accessible and beneficial for all. More inclusive processes will also help to make digital health services more user-friendly and responsive to young people's priorities. Young people also wanted to see greater collaboration and partnership between the public and private sectors and between countries in developing digital first health systems.

The values highlighted by youth are closely intertwined. This value system is reinforced by many of the principles that countries have committed to through human rights instruments and agreements on the Sustainable Development Goals and Health for All. They also align with the value-based approach to governance that was put forward by the Governing Health Futures 2030 Commission (Kickbusch *et al.*, 2021). The consultations reiterate the relevance and importance of this value-based system to health being realized in practice.

Features and user experience of a digital first health system

Knowledge building
(for increased awareness)
- Capacity building
- Health literacy
- Digital literacy
- Health education
- Education

Technical features
(how services are delivered)
- Quick response system
- Localized
- Efficient
- Precise (predictive)
- Functionality
- Reliability
- Quality
- Transformative
- Innovative
- Adaptable and flexible

Design features *(for improved use)*
- Tailored services
- Portability
- Comprehensive bundling of services
- Gamified features
- Hybrid model
- Interactive
- Intuitive interface
- Easy to use and understand

Systems strengthening
(support for delivering services)
- Physical and digital infrastructure
- Connectivity
- Service that transcends boundaries

Figure 3: Ideal features and attributes of a digital first health system

The experience of a digital first health system is shaped by the features and attributes of the system. Key features highlighted by young people included both those relating to the overall health system and specific digital, data-driven products or services that need to be in place to address young people's health priorities.

Young people's preferred features for a digital first health system are grouped into four broad categories:

Knowledge building: Young people want digital first health systems to have strong education and capacity building components so that everyone can use digital tools and make informed decisions about which services to choose, which health information is reliable and how to protect their personal health data. In

addition, youth want to see improved investment in health workers' digital skills and better use of digital tools for their training.

Quality personalized services: Many of the features proposed by participants corresponded to their expectations of health services and how they should be delivered. For example, youth desire an efficient, quick and reliable health system, which can meet their health needs in a timely fashion. The system must be flexible and adaptable to provide localized and contextual health services that are tailored to the individual needs and backgrounds of each person. Finally, young people want to see health systems become more precise in their predictions about both individual and public health risks and accurately recommend appropriate, high quality services.

User-friendly: User experience was a recurring feature of digital first health systems identified by young people in the consultations. Youth want a one-stop digital health platform where they can access multiple services. These services should be designed with young people to ensure they are user-friendly, accessible and non-discriminatory. The interface of digital health solutions should not only be intuitive but also have gamified features to improve user engagement and create a fun experience. Participants were cognizant of the fact that digital may not always be the only solution and that a hybrid model with some physical components will ensure seamless service delivery in situations where beneficiaries may not have access to digital devices or prefer face-to-face interactions.

Everyone (inter) connected: Participants recognized that thriving digital first health systems depend on a foundation of strong digital and health infrastructure as well as seamless interoperability between digital health services and providers. To reap the benefits of digital health innovations, young people want to see barriers to reliable internet access and digital devices resolved. They also want greater international collaboration so they can use digital tools to connect with health providers, patients and communities across the globe, transcending traditional geographical and social boundaries.

"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 system."

Yifan Zhou

Regional Youth Champion Europe and North America (2023–2024), DTH-Lab

Promising tech solutions for a digital first health system

Future thinking exercises generated insights into possible technology-driven solutions that could be incorporated into a digital first health system. Participants were mainly inspired by artefacts that are already available today – such as wearable devices – but that are not yet being used to their full potential for health promotion and delivery. Participants believe there is scope for existing digital health solutions to be scaled up, upgraded and used in new ways. For example, gamification features and greater personalization of digital health solutions could make them more appealing to young users.

There is a strong demand for digital solutions that are integrated seamlessly and discreetly into young people's everyday lives. These technology driven solutions must adhere to the core values outlined by young people while taking into account the features and experience young people want to see in digital first health systems. In both the consultations and essay contributions, youth entrepreneurs were highlighted as being key to driving future innovations that are not just technologically sophisticated but also practical and applicable within local contexts.

DIGITAL WEARABLES

smartwatches, wearable devices that enable health monitoring

VIRTUAL INTERACTIONS

telemedicine services, metaverse/AR hospitals, VR pods, digital self-tests, online medication/pharmacy services

AUTOMATION

medical assistance chatbots, drone delivery, robot surgery, nano bots, haptic tech

DISCREET DEVICES

smartphones/devices that enable private data exchange, paperless databases with huge amounts of data, biometric security systems

TECH IMPLANTS

smart implants, microchips inside body, gene data

DECISION SUPPORT SOFTWARE

AI-powered clinical support for doctors, mobile applications for patients (condition/ lifestyle management)

Digital First Health System

Figure 4: Technology solutions to incorporate into digital first health system

The kinds of tech solutions that young people were especially excited about are categorized below:

Virtual interaction-based services: From telemedicine and metaverse-based hospitals to virtual reality healing pods and digital self-tests, young people are keen for technology to facilitate remote interactions with healthcare providers and ancillary services such as diagnostic centres and pharmacies.

Decision support software: Decision support software, such as clinical support systems for doctors and mobile applications for lifestyle management and monitoring is an important part of the backbone of digital first health systems that must be strengthened and scaled up.

Automation: Young people see many benefits of automation for improving the efficiency of health systems and improving user experience. Many existing or emerging technologies, such as chatbot-powered medical assistance and counselling services as well as other automated services such as delivery of medication by drones, robot surgery, nanobots, and haptic technologies need to be scaled up to benefit more people.

Wearable devices: Wearable devices such as watches, rings, patches and glasses, connected to smart phones or computers, already allow young people to track their own health information and share data with trusted health professionals. There is scope for such tools to be applied to other areas of health and not just traditional avenues of seeking health care.

Connecting to other social networks with shared lived experiences or focusing on preventative behaviours and healthy habits are other ways in which young people expect these technologies to support their overall health and well-being although they are not focused on health service delivery.

Tech implants: Going beyond the idea of wearable devices, young people were also open to digital devices being used in the body such as artificially grown organs, smart implants or tattoos, and microchips to collect information.

Discrete devices: Young people value discrete systems and devices that enable a private and secure exchange of health data. Many respondents shared their desire to move from paper records to more digital health records which can be easily accessed through portable devices. To keep their electronic data safe, several respondents proposed the increased use of biometric security systems .

Additionally, compact, paperless databases and devices that can hold large amounts of data were also seen as desirable ways to record inventions.

Recommendations and key takeaways

The core values and priority features expressed by young people for an ideal digital first health system are a reflection of their concerns about the potential negative consequences of these systems.

Across all six consultations, young people identified significant barriers and challenges that need to be addressed urgently.

1 Addressing bias and discrimination across

Addressing any potential bias and discrimination within digital first health systems, particularly those arising from the introduction of AI and machine learning, was a particular concern for young people. Frequent references to features such as interoperability and comprehensive services indicated young people's desire for digital first health systems to provide a fully integrated and connected suite of services. However, some were concerned that connecting different systems and data sets without careful oversight could allow inherent biases to spread. It is therefore critical that action is taken to eradicate bias in all parts of the wider digital health ecosystem and to make data more representative.

2 Equitable access not greater divides

Surprisingly, there was not a strong focus on creating additional digital health solutions; rather, participants focused on the need to expand equitable access to existing health technologies. There is a persistent, shared concern about whether divides in digital infrastructure and digital literacy will be closed by 2045. Regardless of their current situation and experience with the digital transformation of health, young people from low-income and fragile settings alongside youth from high income countries are equally concerned that the benefits of the digital transformations in health will be shared by all and not just perpetrate further health inequities.

3 Equipped health workforce

Participants highlighted the important role that health workers of all cadres play in deploying technology-driven services. However, particularly in low and middle-income countries, young people noted that the – predominantly female – health workforce lacked the knowledge and skills to leverage digital tools effectively to support young people's health and well-being. The capacity of all health workers, and particularly those providing primary health care, must be improved so they can efficiently carry out their roles within digital first health systems whilst preserving the critical human elements of healthcare that young people value. The views and experiences of health professionals must also be taken into account in the design and testing of digital health solutions as well as the wider digital transformation of health systems.

4 Strengthened health data governance

Policymakers and tech companies must strengthen data health governance to balance the benefits of sharing health data with young people's desire to withhold privacy and confidentiality. The next phase of this project will explore how incorporating a solidarity-based approach to data governance could allow digital first health systems to address young people's concerns, for example, risks associated with data breaches, misuse of personal data and abuses of privacy.

5 Political will to listen to youth

Although the majority of young people are fairly confident that their ideal digital first health system will be a reality by 2045, there is still a large group of young people who have low confidence. With key concerns related to political instability and resistance to change, a concerted effort is required from multiple stakeholders to not only engage young people in the design and governance of digital first health systems, but to listen to and act upon their recommendations. Greater investment in education, mentorship and innovation spaces is needed to foster the next generation of health workers, entrepreneurs and political leaders. Fostering digital health citizenship can play a crucial role in addressing the lack of enfranchisement experienced by young people in relation to digital transformations of health. Promoting digital health citizenship among children and youth not only increases their ability to thrive in the digital age but also equips them with essential skills to shape their health futures.

Learning and limitations

Several key learnings from this first phase will need to be assessed moving forward in the development of a blueprint for digital first health systems.

Firstly, the global youth networks consulted are highly knowledgeable and experienced with the ins and outs of global health governance health systems strengthening and/or digital transformations. Sampling such a group of well-informed young people may have framed the discussions, use of language and overall findings in a particular way. Secondly, consultations amongst global groups do not allow for national or context-specific issues to be discussed in detail. To overcome these limitations phase two of this project will need to bring additional diversity of lived experience to reach context-specific solutions.

Lastly, a key limitation to this phase of work was the superficial dive into *how* to achieve the ideal digital first health system. By focusing on the overall values, health priorities, key features and challenges of a digital health system, there was little time to adequately unpack these ideas and capture solutions on how these ideals could be put into practice. With the limited time available, it was challenging for workshop participants to fully harness their imaginations and think far beyond current digital health solutions and the barriers and challenges that youth face in seeking health care services or health promotion in general. Future consultations will therefore use the global findings as a launch pad to formulate concrete and actionable recommendations for stakeholders to take in realizing digital first health systems.

Act on youth priorities now!

Young people agree on the health future they want and the essential elements of a digital first health system.

They also know they are the rightful co-creators of this future and want greater opportunities and support to fulfil this role. As the development phase of the blueprint is underway, policymakers and other stakeholders can already begin to incorporate young people's views into governance decisions and ensure that their health, well-being and aspirations for the future are at the forefront of the digital transformation of health systems.

Next steps in building a blueprint for digital first health systems

2021	2022	2023
	Workshops with global youth networks	
	#MyHealthFutures campaign	
	———————————	
Governing Health Futures 2030 Commission report	Pilot workshop at One Young World Summit	

Phase 1

Global consultations – Creating a vision (**2022–2024**)

This first phase of this project painted a picture of young people's vision for digital first health systems and the barriers that need to be overcome to achieve it. The findings from these consultations reinforced the Governing Health Futures 2030's recommendation of putting young people at the centre of digital transformations of health by involving them in each step of the process from co-creation to solution generation for them to be active digital health citizens. Participants' inputs also validated the Governing Health Futures 2030's recommendations around closing digital divides, building trusted digital health ecosystems and strengthening data governance to ensure that the value of health data is harnessed for public good. These findings reinforce the urgency of DTH-Lab's work to translate the Commission's recommendations into action.

2024

Global report on young people's priorities for digital first health systems

2025

Regional and national level report

Blueprint for designing digital first health systems

Regional and national workshops

This global interim report summarizes the first stage of a three-year project to develop a blueprint for designing digital first health systems that lay out tangible actions stakeholders can take in establishing equitable, inclusive and sustainable digital first health systems.

Phase 2

Regional and country-level consultations – Making tangible action (2024–2025)

In moving forward, phase two of this work will harness the insights and imagination of more young people, including medical students and young healthcare professionals, on the future design and governance of digital first health systems with a stronger emphasis on capturing different regional and national perspectives. This phase will also focus on outlining key actions that stakeholders can take to create digital first health systems that respond to young people's priorities. The findings from this phase will be published in a regional interim report in early 2025.

Phase 3

Stakeholder consultations – Testing a youth-designed blueprint (2024–2025)

In phase three, key stakeholder groups including international organizations, academia and private actors will be consulted to ensure the blueprint and its recommendations are operational and reflective of current strategies. This phase aims to build the buy-in and readiness of different actors to take forward young people's recommendations in creating digital first health systems built for young people.

Note: timeline correct at time of original publication in May 2024.

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Annex 1: Youth-authored essays on digital first health systems

Series 1, published in December 2022

Health futures: Digital first health systems for and with young people.

- Abdullah Rajeeb Al-Khafajy (Iraq). Youth-led digital first health systems: Challenges and opportunities in the age of the disruptive entrepreneur.

- Babajide Babayeju (Nigeria). Improving treatment outcomes via electronic prescribing.

- Dominique Guillaume and colleagues (USA). Centering community perspectives in the development of digital health interventions: A case example of an HIV prevention application.

- Jade Murray (Trinidad and Tobago). Closing the digital health gap in the Caribbean: A call for digital transformation of the health sector in the region.

- Janil Devani (India). Digital health: The key to overcoming disparities in health.

- Joseph Bruce (Ghana). Youth-focused digital first health systems in Africa.

- Taofeekat Adigun (Nigeria). Advancing digital health systems and governance.

Series 2, published in April 2024

Creating and sustaining digital first health systems: Special priority areas for young people

- Caroline Knop (Germany). Empowering Tomorrow's Health: The Transformative Potential of Digital First Health Systems in Boosting Health Literacy.

- Imane Lakbachi (Morocco). Digital Literacy's Central Role in Deploying Effective Digital First Health Systems.

- Lydia Jummai Gara (Nigeria). Sexual and Reproductive Health and Rights and Digital Health.

- Nojus Saad (Iraq). Youth Entrepreneurship: Redefining Digital Healthcare in Emerging Economies.

- Philip Injendi Yauma (Kenya). Data Science and Research For Digital Health Technologies.

- Soe Yu Naing (Myanmar). Empowering Communities: A Digital First Health System Approach to Pandemic Preparedness through Citizen Science.

- Yifan Zhou (Canada). Digital health and intersectionality: Ensuring equity and inclusion of marginalized youth.

Annex 2: Global consultation data

Date	Group	Number of participants	Countries represented
07/09/2022	One Young World	20	Australia, Cameroon, Canada, Hong Kong (China), Japan, Mexico, Netherlands, Nigeria, Sweden, Thailand, UK, USA. (12)
05/12/2022	YET4H & Regional Youth Champions (2022/23 cohort)	12	Cameroon, Canada, Egypt, Germany, Indonesia, Jamaica, Kenya, Lithuania, Mexico, Solomon Islands, UK. (11)
31/01/2023	AI Future Lab – group 1	12	Canada, Italy, Mexico, Nigeria, South Africa, Trinidad and Tobago, USA. (7)
01/02/2023	AI Future Lab – group 2	12	Czech Republic, Italy, India, Indonesia, Kenya, Netherlands, Nigeria, Trinidad and Tobago, UK. (9)
06/12/2023	Regional Youth Champions (2023/24 cohort)	15	Cameroon, Canada, Germany, Hong Kong (China), India, Iraq, Jamaica, Kenya, Morocco, Myanmar, Nigeria, Portugal, Switzerland, UK. (14)
30/01/2024	IFMSA	26	Brazil, Cameroon, Egypt, Germany, Ghana, India, Iran, Kenya, Morocco, Nepal, Nigeria, Oman, Sudan, Ukraine. (14)

All countries represented in global consultations

Categorized according to World Bank classification

Low income countries	Lower-middle income countries	Upper-middle income countries	High income countries
Sudan	Cameroon	Brazil	Australia
	Egypt	Indonesia	Canada
	Ghana	Iraq	Czech Republic
	Kenya	Jamaica	Germany
	India	Mexico	Hong Kong (China)
	Iran	South Africa	Italy
	Morocco	Thailand	Japan
	Myanmar		Lithuania
	Nepal		Netherlands
	Nigeria		Oman
	Solomon Islands		Portugal
	Ukraine		Sweden
			Switzerland
			Trinidad and Tobago
			United Kingdom
			United States