



DIGITAL
TRANSFORMATIONS
FOR HEALTH LAB

GOVERNING HEALTH FUTURES 2030



Digitally enabled health systems that address the needs of young people



A framework for
health leaders



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Digitally enabled health systems that address the needs of young people

A framework for health leaders involved in the development and implementation of national digital health strategies

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Glossary

Young people	Refers to adolescents and youth between 10 and 29 years of age, in the transition from childhood to adulthood.
Digitally enabled health system	A digitally enabled health system is a hybrid model of care in which integrated digital solutions and data support health promotion, prevention, diagnosis, treatment, rehabilitation and palliative care. It complements in-person services to improve access, continuity, quality and efficiency, while enabling individuals, providers and public health authorities to engage more effectively. Grounded in strong governance, interoperability, privacy and inclusion, it is designed to be equitable, secure, sustainable and responsive to evolving needs. The term digitally enabled health systems is meant to be fully aligned with the goals of the WHO Global strategy on digital health 2020-2027 and the WHO Global Initiative on Digital Health (GIDH). Digital solutions need to be standards-based and interoperable to ensure continuity of care across digital public infrastructure (DPI) and private sector building blocks of the digitally enabled health system.
Digital determinants of health	Structural conditions that affect health and well-being through digitally mediated infrastructures, business models, design choices and information environments.
Digital citizenship for health	The combination of digital, health and civic literacy and skills which enables individuals to navigate, critically evaluate and actively shape digital health systems.
Data solidarity	An approach that seeks to achieve a more equitable sharing of benefits and risks emerging from data use and other digital practices.
Privacy by design	A proactive methodology that embeds privacy, data protection and security into the architecture of IT systems, business practices and product development from the very beginning.
Online harms	Negative experiences, behaviours or content delivered through digital technologies that affect an individual's safety, physical or mental well-being, reputation or privacy.
Safety by design	Refers to embedding protections, ethical safeguards and risk-mitigation measures into digital and AI-enabled platforms from the outset. This includes age-appropriate protections, safer algorithmic design, privacy safeguards, transparent moderation and accountability measures to reduce misinformation, harmful content, exploitative practices and unsafe AI-generated interactions for young people.

Executive summary

Digital technologies are rapidly transforming health systems worldwide.

More than 125 countries have developed national digital health strategies and global initiatives such as the World Health Organization's (WHO) Global Initiative on Digital Health (GIDH) are accelerating standards-based and interoperable approaches to digital transformation. Yet, despite young people being among the most active users of digital technologies and among the populations most affected by digital environments, their needs remain insufficiently reflected in national digital health strategies. An analysis of the 87 strategies accessible via WHO Global Repository on National Digital Health Strategies showed that **57% of them did not reference young people's needs** and did not mention initiatives addressing young people in their national digital health strategy or policy documents. And out of the **43% of countries that referenced young people**, most referred to children **in the context of broader themes** such as maternal and child health or vaccination programmes supported by digital tools.

This framework, developed by Digital Transformations for Health Lab (DTH-Lab), provides **guidance for health leaders** on how to design and implement digitally enabled health systems that address the needs of young people between 10 and 29 years of age. The framework aligns with the WHO Global Strategy on Digital Health (2020–2027), GIDH and broader global efforts to promote equitable, standards-based and people-centred digital transformation in health systems.

The framework **recognizes that young people face distinct and evolving health challenges** shaped by social, environmental and digital determinants of health. Mental health conditions, sexual and reproductive health needs, certain noncommunicable



diseases (NCDs), the impact of social media and AI-chatbots on young people, climate-related health risks and exposure to misinformation are priority topics for young people. At the same time, young people expect accessible, responsive, confidential and integrated care experiences that combine in-person and digital services.

To address these realities, the framework proposes eight levers for action. The first four focus on **‘what’ digitally enabled health systems should include**: integrated youth-responsive digital health services, service-delivery and financing models embedded across schools, universities, workplaces and communities, digital health literacy and safe engagement with AI and social media and workforce capacity for digitally enabled care for young people. The remaining four focus on **‘how’ systems should be implemented**: meaningful youth participation in governance, equitable and accessible system design, strong privacy, data protection and accountability mechanisms; and robust monitoring, evaluation and learning systems that use real-time data and youth feedback to continuously improve services.

The framework emphasizes that digital transformation should move beyond fragmented pilot projects towards interoperable, sustainable and trusted systems grounded in Health for All values of equity, inclusion, solidarity and human rights. It also highlights the importance of youth-responsive AI governance, including risk-tiered approaches to AI adoption, safeguards for higher-risk applications and mechanisms to ensure transparency, accountability and trust.

Ultimately, the framework positions investment in youth-responsive digitally enabled health systems as both a public health and economic imperative.

By embedding young people’s needs, lived experiences, rights and evolving digital realities into national digital health strategies, countries can build more resilient, equitable and future-ready health systems that improve health outcomes across the life course.

INTRODUCTION

Young people must not be forgotten as health systems become digitized

As countries accelerate the transition towards standards-based, interoperable digitally enabled health systems, it is critical to recognize that young people engage with digital technologies in distinct ways (Banerjee & Holly, 2026). Yet, their needs, risks and lived experiences remain insufficiently embedded in system design, governance and implementation.

Globally, an estimated 2.6 billion people are aged between 10 and 29 years according to the 2025 population estimates from the United Nations Department of Economic and Social Affairs.¹ The majority of these young people live in low- and middle-income countries, where they constitute **more than 40% of national populations in many countries** (UN, 2024). Health is an important topic for young people: findings from a systematic analysis for the Global Burden of Disease Study 2021 identified self-harm, interpersonal

violence, mental disorders and NCDs among the leading causes of disability-adjusted life years (DALYs) for individuals aged 10 to 29 years (Naghavi M. et al., 2024). Complementary insights from global and regional consultations with young people conducted by DTH-Lab further underscore that young people seek integrated health services that are conducive to their health needs and are capable of providing stigma-free continuity of care for five priority health areas: mental health, sexual and reproductive health (SRH), nutrition and fitness, climate-related health issues and NCDs (DTH-Lab 2024, 2025a). In addition, social media, AI chatbots and misinformation on the Internet have a negative impact on young people, an issue which is the subject of discussion in several countries (Chang et al., 2025).

In addition to having specific health needs, young people's evolving capacity during their second and third decades

¹ Based on the median variant projection from the [World Population Prospects 2024](#), which represents the United Nations' central or most likely population projection scenario. The estimate was calculated by aggregating the 10–14, 15–19, 20–24, and 25–29 age groups for both sexes combined.

has implications for how they can engage with health systems. During this period of transition from childhood to adulthood, young people develop a desire and capacity to independently manage their health. Ownership and use of digital devices typically increases during adolescence, enabling young people to access health information online and use digital health services directly. In many parts of the world individuals transition from paediatric to adult health services between the ages of 16 and 18, presenting challenges for continuity of care (David, 2001).

From fragmented pilots to system transformation

Over the past decades, many health systems have experimented with an array of digital health solutions – many of them as **digital health pilots and fragmented solutions** that have proven difficult to scale or sustain. This fragmentation has raised important questions about the tangible value and system-level impact of digital health investments. Emerging evidence, however, is promising. In a 2021 analysis of 204 academic publications that quantitatively addressed digital health, 163 studies (80%) demonstrated the benefit of digital health systems. Of these positive studies, 77% showed a benefit in health status of the patient, 20% showed time savings for healthcare professionals and 3% showed cost savings for the health system or higher economic efficiency (Müller, et al., 2022).

While there is growing evidence that digital tools can improve outcomes for patients and save time and money for health systems, the uptake of digital health offerings has been inconsistent. While some offerings (such as online appointment booking with healthcare providers) have been broadly popular, other offerings have had mixed uptake (e.g., electronic patient records or video consultations) (Paré et al., 2014, Jones et al., 2022).

In recent years, there has been a positive shift from fragmented digital health solutions towards **standards-based, interoperable digital health solutions** as drivers of progress towards digitally enabled health systems. This is outlined by WHO in its Global Strategy on Digital Health, 2020–2025 (the World Health Assembly endorsed its extension to 2027 and approved the next phase for 2028–2033) and by the World Bank in their report Digital-in-health: Unlocking the value for everyone (WHO, 2021; World Bank, 2023; Mehl et al., 2023). Similarly, many **health insurers and healthcare providers** have expanded their digital health offerings which focus on prevention, acute care and chronic disease management.

In addition, the direct and indirect effects of digital health solutions on people's health and well-being have been recognized as **digital determinants of health** (Kickbusch & Holly, 2023). The profound challenges and opportunities of digital tools require thoughtful design and governance of digitally enabled health systems, which should be grounded in “core Health for All values of democracy, equity, solidarity, inclusion and human rights” (Kickbusch et al., 2021).

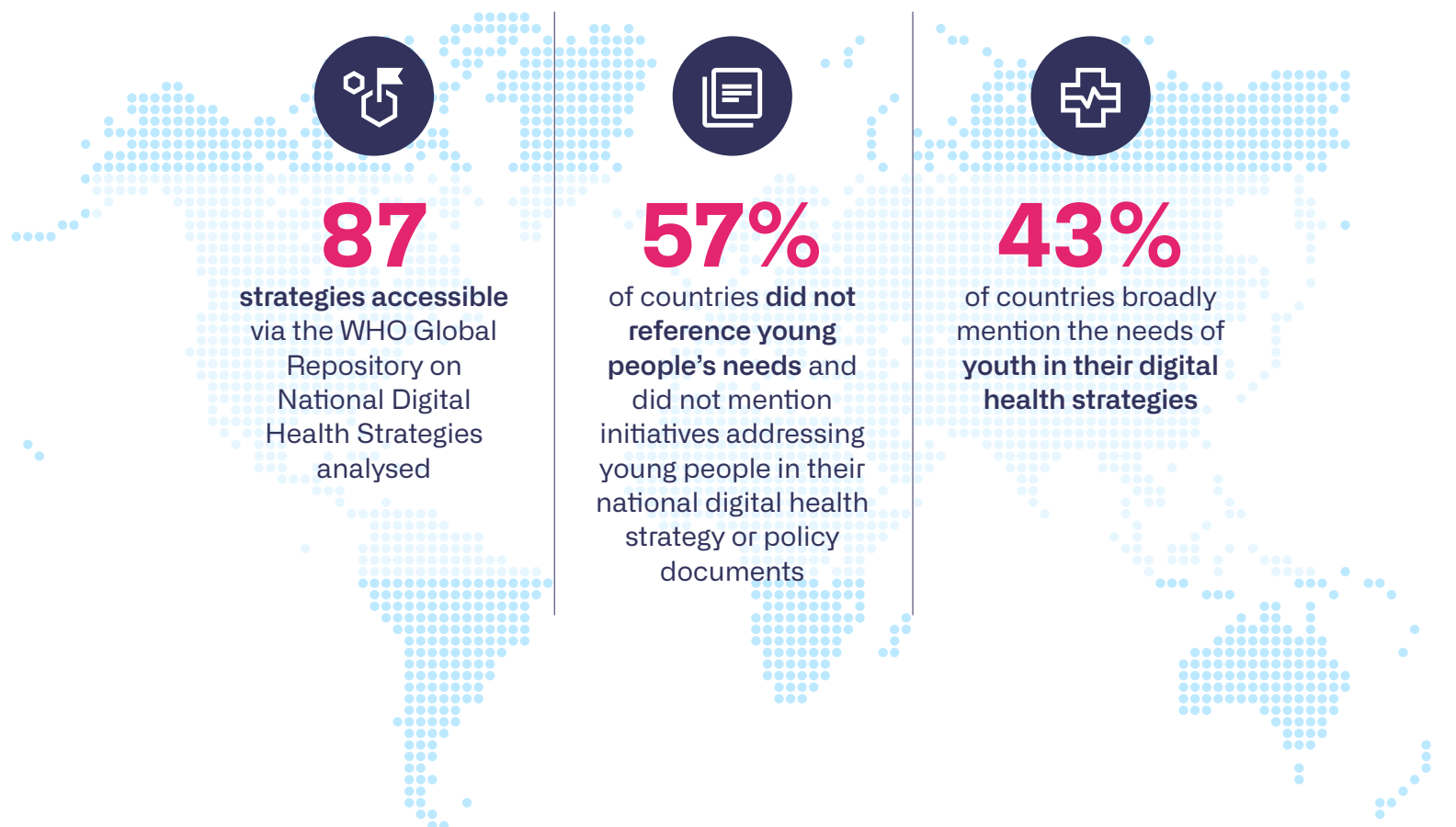
Future-proofing digitally enabled health systems for young people

So far, more than 125 countries have developed **national digital health strategies** and the Global Initiative for Digital Health by WHO (GIDH) has started to coordinate digital health work across countries (WHO, 2024). However, few of these strategies explicitly address the health of young people. An analysis of the 87 strategies, accessible via the

WHO Global Repository on National Digital Health Strategies showed that **57% of them did not reference young people's needs** and did not mention initiatives addressing young people in their national digital health strategy or policy documents (Mitra & Silberzahn., 2026). Out of the **43% of countries that referenced young people**, most referred to children **in the context of broader themes** such as “maternal and child health” or “vaccination programmes” supported by digital tools. [Refer to Figure 1].

Only a few countries were more specific – a positive example is **Sweden, which has included online health**

Figure 1: Analysis of National Digital Health Strategies



information for young people in their national e-health strategy since 2010. Sweden established the website UMO.se for young people between the ages of 13 and 25 years. The website provides answers to questions about the human body, sexual health, mental health, alcohol and drugs, self-esteem and relationships. It also includes a catalogue of youth clinics and is run on behalf of Sweden's regions and municipalities without the use of advertising on the website.

Addressing young people's needs is a significant opportunity for health leaders to **future-proof** the digitally enabled health systems that are currently being developed and implemented. Based on the recommendations of the Lancet and Financial Times Commission in *Governing health futures 2030: growing up in a digital world*, this framework outlines a vision based around eight levers for how countries can shift

to digitally enabled health systems which consider young people and their needs. The framework is intended to be consistent with the WHO Global Strategy on Digital Health, the work of Global Initiative for Digital Health (GIDH) and other efforts to drive the equitable digital transformation of health systems including Transform Health's *Roadmap to 2030: Health for All in the Digital Age*.

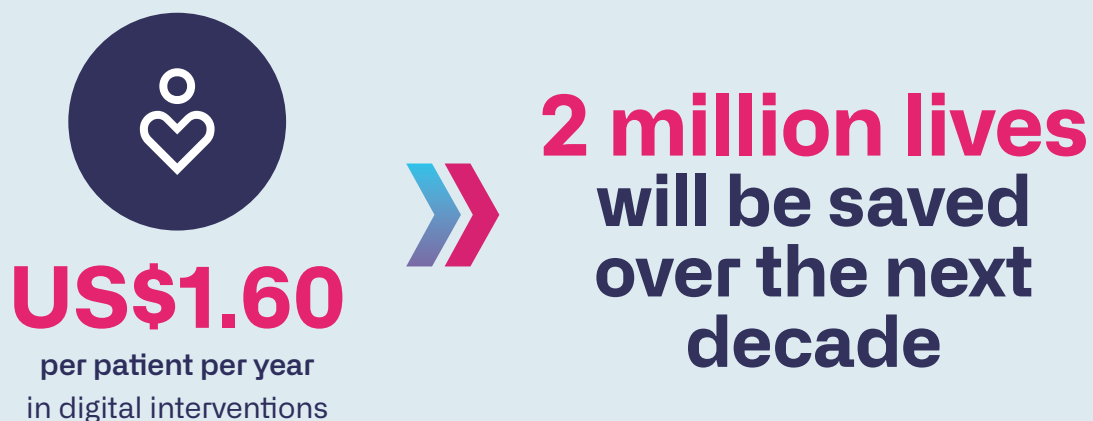
The target audience for the framework is health leaders who are involved in developing, reviewing, updating and implementing national digital health strategies.

A case study of digital health interventions for NCDs

Why invest in a digitally enabled health system that supports the needs of young people?

Investment in digital health systems represents a high-leverage opportunity to break the self-reinforcing cycle of avoidable disease burden globally, particularly among young people who carry a disproportionate share of preventable morbidity and mortality.

WHO suggests that investing US\$1.60 per patient per year in digital interventions like telemedicine, mobile messaging and chatbots now, means that more than two million lives will be saved over the next decade, with a highly favourable return on investment of US\$ 2.02–24.68 for every US\$ 1 invested.



This is evident in countries in Latin America and the Caribbean. In this region, 67.5% of adults are overweight or obese, the highest globally. The prevalence of obesity among children and adolescents rose from 21.5% in 2000 to 30.6% in 2016, exceeding 35% in countries such as Argentina, Chile and Mexico by 2025 (PAHO, 2024); (UNICEF Latin America and the Caribbean Regional Office, 2023); (PAHO, 2025). These early risk patterns are projected to result in productivity losses of US\$7.3 trillion in South America between 2020 and 2050, equivalent to roughly one year of regional GDP (PAHO, 2025). Yet digital NCD interventions costing as little as US\$0.24 per patient per year are projected to have returns of up to 830:1, with the potential to save two million lives and generate US\$199 billion in economic benefits over a decade, illustrating the scale of impact achievable through targeted digital investment (WHO & International Telecommunication Union, 2024).

THE VISION

A digitally enabled health system that meets the needs of young people

A **digitally enabled health system** that meets the needs of young people is a hybrid system of digital health and in-person healthcare where:

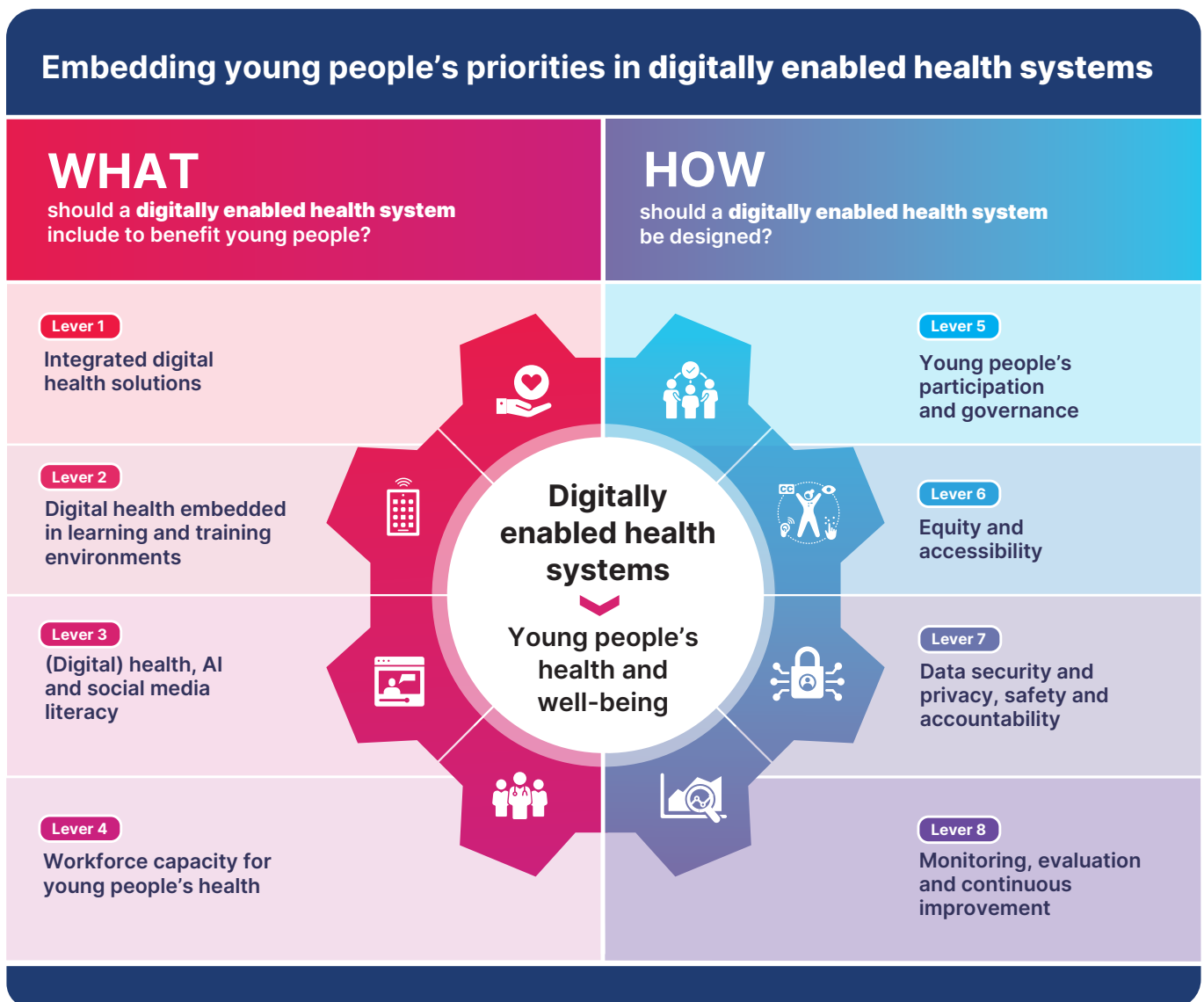
- Young people are offered age-appropriate information and solutions that meet their evolving needs in terms of prevention, acute care and chronic disease management to advance their health and well-being;
- Social and digital determinants of health are taken into account, to ensure that young people can easily and equitably access quality health information and services;
- Digital and data governance is participatory and inclusive with the active engagement of young people (and other parts of society) to ensure that innovations in health and other sectors contribute to the greatest possible standard of health and widespread benefits of digital transformation, a prerequisite to increasing people's trust in a digitally enabled health system;
- Digital health architecture is interoperable, standards-based, secure and sustainable (aligned with the WHO Global Strategy on Digital Health) to support quality and continuous care for all young people.

To bring this vision to life, the following framework provides eight levers for national health leaders to consider.

Framework with eight levers to ensure national digital health strategies address the needs of young people

To translate this vision into action, countries must consider young people as a population group with distinct health needs and an evolving capacity for participation in relation to digital health systems. Countries must move beyond fragmented digital health initiatives and national digital health strategies that mainly digitize existing healthcare infrastructure or workflows, instead they must redesign comprehensive health systems that intentionally consider the needs of its young people.

Figure 1 outlines eight levers that provide a practical **framework** to guide health leaders in embedding young people's needs, rights and lived realities in national digital health strategies. Together, they outline what must be in place to ensure that the digital transformation of healthcare delivers equitable, trusted and effective health outcomes for young people. To support implementation, a **checklist** of guiding questions is included at the end of this document to help policymakers identify opportunities to improve existing digital health strategies.



THE WHAT

What a digitally enabled health system should include to benefit young people

Lever 1

Lever 2

Lever 3

Lever 4



Lever 1



Integrated digital health solutions

Young people consistently emphasize their need for **accessible, confidential and comprehensive health services** that reflect the complexity of their lived experiences. Young people's physical health, mental health and well-being concerns often intersect with systemic risk factors shaping the societies they live in, such as digitalization, climate change, conflict and urbanization. Findings from a systematic analysis for the *Global Burden of Disease Study 2021* identified self-harm, interpersonal violence, mental disorders and NCDs among the leading causes of disability-adjusted life years (DALYs) for individuals aged between 10 and 29 years (GBD 2021 Diseases and Injuries Collaborators, 2024). Complementary insights from global and regional consultations with young people conducted by DTH-Lab further underscore that young people seek **integrated health services that are conducive to their health needs and** are capable of providing stigma-free continuity of care for five priority health areas: **mental health, SRH, nutrition and fitness, climate-related health issues and NCDs** (DTH-Lab 2024 & 2025a).

To respond to these realities, a health system that provides **integrated and continuous digitally enabled healthcare** needs to provide a continuum of youth-friendly health promotion, prevention, treatment and rehabilitation services. It must link key health domains such as SRH, mental health and acute care through standards-based and interoperable digital health solutions, ensuring that services are easily accessible and evolve with users as they transition from adolescence into adulthood. It needs to acknowledge that the nature and integration of these services are not static across the broad age span of young people as a group. The health needs, decision-making autonomy and patterns of service use of a younger adolescent (e.g. 10–15 years) differ significantly from those of older youth (e.g. 20–29 years), creating a requirement for differentiated service configurations within an integrated system.

Importantly, young people increasingly expect health systems to be accessible at any time of day, which underscores the value of round-the-clock telehealth and digital triage systems that can guide users to the appropriate level of care in real time. Therefore continuity of care and interconnected digital health solutions are of high importance.

What governments should consider

- **Alignment between needs of young people and digital-health priorities:**

Governments should examine whether national digital health strategies meaningfully reflect the needs that young people identify as most relevant. Digital health practitioners must work closely with child, adolescent and youth health specialists to ensure that digital health strategies help to address major risk factors and causes of poor health for young people, as well as to anticipate future health challenges. This would also include recognizing heterogeneity within the 10 to 29 age group and avoiding one-size-fits-all digital health solutions, by explicitly defining age-segmented use cases (e.g. early adolescence, late adolescence, young adulthood) within national strategies.

- **Enable integrated, interoperable and continuous care pathways:**

The needs of young people for easy (online) access and continuity of care call for a standards-based, secure and interoperable digital health architecture in line with the WHO Digital Health Strategy. The Full-STAC framework (Standards, Technology, Architecture and Content) proposed by Mehl et al., 2023, would enable effective integration of youth-friendly digital health services into a broader digitally enabled health system: Standards define the rules for data exchange and interoperability; Technology provides the secure infrastructure and tools such as application programming interfaces (APIs), cloud services and cybersecurity protocols that enable real-time connectivity; Architecture organizes how systems and stakeholders interact across ministries and service providers; and Content ensures that information, interfaces and clinical guidance remain inclusive, evidence-based and accessible. Together, these components form a coherent ecosystem where data flows safely, users can transition

between services without disruption and healthcare is responsive to the evolving needs of young people.

Beyond enabling immediate service integration, interoperability represents a long-term investment in strengthening health systems. As digitally enabled health systems evolve, interoperable and standardized data systems enable the creation of large, consistent datasets that strengthen the precision and applicability of AI in integrated care (Williams et al., 2023; Unger & Kather, 2024). At the same time, these systems support the development of longitudinal health records that follow individuals across different stages of life, enabling continuity of care, more accurate clinical decision-making and improved anticipation of health risks as young people transition into adulthood.

- **Responsiveness and 24/7 availability:**

Young people increasingly expect health systems to be responsive at any hour of the day. From a digital health perspective, this could be achieved by making available round-the-clock telehealth and digital triage mechanisms that can connect users to professional or peer support when needed.

- **Age-appropriate information and empowerment:**

An integrated system should empower young people to make informed decisions as they transition through life and become more independent. This includes curating content and services that evolve with young people from childhood to adolescence, through to adulthood. For example, younger adolescents may require stronger integration with parental or caregiver engagement whereas older youth can navigate services more independently. Embedding this continuity supports WHO's vision of person-centred, life-course health systems.

Lever 2



Digital health embedded in learning and training environments

Schools, colleges, vocational training centres and apprenticeship programmes represent some of the most consistent and structurally reachable environments in the lives of adolescents and young adults. Evidence shows that adolescents frequently rely on school-based or campus-based touchpoints for mental-health counselling, SRH information and first contact for injuries or stress-related concerns (Bains & Diallo, 2016; Itriyeva, 2024). Where youth health centres, university health centres or school clinics exist, these spaces often serve as initial entry points into the health system, but coverage can remain uneven, staffing limited and there can be confidentiality challenges, especially for SRH and mental-health concerns (Anderson & Lowen, 2010; Werdhani et al., 2025; WHO & UNESCO, 2021). In addition, evidence consistently shows that out-of-school populations and young adults in informal work environments are best reached through a combination of direct digital channels, community-mediated access (such as community health workers, NGOs, peers) and integrated system platforms.

Youth consultations conducted by DTH-Lab indicated persistent barriers within these touchpoints for young people, such as, long waiting times,

stigma in face-to-face settings, lack of privacy in supervised environments and highly inconsistent referral pathways between school-based services and external providers (Digital Transformations for Health Lab, 2024). Many young people also report concerns that their health information and counselling histories are not portable as they transition from one setting to another (e.g., transitioning from school to college), forcing them to “start over” repeatedly (Psihogios et al., 2022).

Studies show that adolescents often prefer anonymous, flexible digital services especially when dealing with sensitive issues over formal in-person systems (Garrett et al., 2024; Wong et al., 2019). A digitally enabled health system can address these gaps by embedding interoperable digital health services within the systems which young people are already using. Digital services integrated into school or university portals, university counselling platforms, or vocational-training solutions can provide safe access to confidential health information, anonymous triage, teleconsultations, mental-health self-help tools and discreet referrals for treatment.

What governments should consider

- **Institutional integration across learning and training environments:** Governments should assess how the needs of schools, colleges, vocational institutes and apprenticeship programmes are addressed in their national digital health strategies and the extent of their integration with national digital health infrastructures. The Global Strategy on Digital Health 2020–2027 stresses that digital transformation must occur across the entire health ecosystem, requiring strong inter-ministerial collaboration. Ministries of health, education, information and communications technology (ICT) and labour should jointly define how digital health services such as digital health promotion, digital triage, video consultation, digital mental health solutions and SRH information modules are embedded into institutional systems that young people interact with daily. Countries may consider integrating digital health *access points* into university portals, school health services or platforms used in vocational training programmes.
 - **Reaching underserved young people through integrated, multi-channel delivery systems:** Evidence shows that out-of-school populations and young adults in informal work environments are most effectively reached through integrated, multi-channel approaches rather than standalone solutions, due to persistent barriers including digital literacy gaps, device constraints and uneven connectivity (March et al., 2018). Evidence further indicates that community health workers (CHWs), peer networks and local organizations play a critical bridging role in extending the reach of digital health interventions (Zettergren et al., 2024). Digitally enabled CHW programmes improve service delivery by combining digital tools with in-person engagement, while multi-channel communication strategies, which integrate interpersonal, digital and mass media approaches, have been shown to increase uptake and trust.
 - **Sustainable and predictable financing models:** Governments should consider dedicated budget lines that sustain digital health services, maintenance, human support and data-security infrastructure in school and training settings. Financing mechanisms might include: inclusion of youth digital health in Universal Health Coverage (UHC) benefit packages; results-based financing agreements between ministries; pooled education-health budgets; and partnerships with telecom providers to subsidize data use for youth-health platforms. The World Bank's framework *Digital-in-Health* (2023) emphasizes that predictable financing is foundational for scaling digital health services equitably, particularly for adolescents who often have limited individual purchasing power.
- Financing models should also reflect governance structures, with clearly defined roles, budget allocations and spending authority across national, provincial and local levels to ensure effective implementation and accountability, particularly in decentralized systems where service delivery or school budgets are managed at local levels.

Lever 3



(Digital) health, AI and social media literacy

Many young people actively seek health information and advice online, particularly through social media platforms and AI chatbots. However, limited health and digital literacy can affect their ability to interpret symptoms, evaluate risks, verify online information, understand algorithmic influence or assess data consent (Asari et al., 2025; Stifjell et al., 2025; UNICEF, 2021; You & Ahn, 2025). These gaps increase exposure to misinformation, harmful content and unsafe digital behaviours, ultimately shaping whether young people can meaningfully access and benefit from digitally enabled health systems (Naeem & Boulos, 2021; Khayru,

2025.; Nugrahani, 2022). Strengthening digital health literacy is therefore critical for health promotion and prevention, particularly as early habits related to technology use, sleep, nutrition, mental well-being and sexual health influence long-term health outcomes (Fitzpatrick, 2023; WHO, 2016). Beyond functional skills, this requires advancing digital citizenship for health, equipping young people to exercise agency, understand their rights and responsibilities, navigate data and consent, recognize harmful digital design and engage ethically and safely within digital health ecosystems (DTH-Lab, 2025c).

What governments should consider

- **Integration of digital health literacy into formal education systems through coordinated investment:**

Governments should embed health literacy, digital literacy and critical media literacy within national curricula from early adolescence onward, including through digital citizenship education frameworks. This should combine foundational health topics with practical digital competencies such as managing personal technology use, evaluating online health information, verifying sources, understanding algorithmic influence and assessing the credibility

of health apps, influencers and AI-generated content. Strengthening these competencies is critical to tackling misinformation and enabling young people to identify and utilize trustworthy and reliable health information in increasingly complex digital environments (Mukhtar et al., 2025).

Sustained progress requires coordinated investment across ministries of health, education, ICT, youth and information rather than isolated short-term projects. Cross-sector collaboration can support national standards for curriculum

content, evidence-based health messaging, verification protocols for digital health information and ethical data governance guidelines. Such system-wide approaches are essential to counter misinformation ecosystems and reduce risks associated with predatory health apps, unsafe AI-generated advice and harmful digital content targeting youth. Shared investment aligns with GIDH's emphasis on governance, national ownership and system-wide alignment across sectors (WHO, 2023).

- **Ensuring safe and responsible use of social media and AI chatbots for health promotion:** Social media and generative AI can serve as valuable tools for youth health promotion, health information access and peer support when designed with safety and accountability as core principles rather than engagement maximization. However, evidence shows that current platform designs can contribute to harmful outcomes, including misinformation, disrupted sleep, problematic use behaviours and manipulative engagement practices (Carah et al., 2024; Tefera et al., 2025; Kickbusch, 2026).

Governments should also establish stronger accountability frameworks for technology companies through mandatory transparency reporting on usage patterns, independent oversight mechanisms and clear regulations addressing harmful algorithmic practices and unsafe AI-generated interactions. Algorithmic systems must prioritize well-being and trustworthy health

communication rather than maximizing engagement. This includes reducing exploitative youth-targeted advertising and improving moderation of harmful content (Carah et al., 2024; Tefera et al., 2025). Complementary investments in digital and AI literacy are equally important to help young people critically assess health information, understand algorithmic influence and navigate social media and AI-enabled platforms safely and responsibly.

- **Youth-led behaviour-change campaigns:** Governments can fund and co-design national campaigns where young people lead the creation of content and formats – especially relating to sensitive issues such as body image, SRH stigma, online harassment, misinformation and mental well-being. Youth-driven design increases relevance and cultural resonance, particularly across socio-linguistic and rural-urban divides. Platforms like U-Report and Safe Online initiatives show that co-created digital campaigns enhance reach and credibility among adolescents (Lancet Digital Health, 2020). Ministries may provide regulatory oversight, funding and institutional amplification, while youth networks can guide narrative framing and digital dissemination. Positioning young people as co-creators reinforces digital citizenship by strengthening their capacity to challenge misinformation and advocate for healthier digital environments within their communities (DTH-Lab, 2025b).

Lever 4



Workforce capacity for young people's health

A digitally enabled health system for young people is only as effective as the workforce delivering it. Young people consistently report that trust in digital health services depends not just on technology, but on whether health workers are knowledgeable about their health needs, sensitive and non-judgmental in their interactions and competent in using the digital tools young people rely on (Hardin et al., 2021; Jarva et al., 2022; Wong et al., 2020). Evidence from global youth consultations highlights persistent concerns around inaccurate information, lack of confidentiality and dismissive or moralizing attitudes from health providers, particularly in digital and remote settings, which can undermine confidence in both services

and systems (Governing Health Futures 2030, 2021).

A workforce serving young people must therefore be grounded in a balanced skill set: (1) strong clinical competence in health guidelines related to issues that affect young people, (2) empathetic, rights-based engagement with young people's lived realities and (3) practical proficiency in digital health tools, platforms and data practices. When these capabilities are aligned, digitally enabled care can enhance continuity, responsiveness and credibility, strengthening young people's trust and willingness to engage with public health systems.

What governments should consider

- **Building age-specific and digitally enabled workforce capacity through continuous learning:** Governments should ensure that health workers delivering services to young people are trained in adolescent and young adult health guidelines alongside practical skills for delivering care through digital health solutions such as video consultations, messaging and digital triage systems. The WHO, alongside the United Nations Population Fund

(UNFPA), United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations Children's Fund (UNICEF), released the 2020 *Youth-centred digital health interventions* framework, which outlines steps for planning, developing and implementing digital tools tailored for young people (WHO, 2020). The framework emphasizes training health workers on youth engagement in digital design, understanding platform

preferences (e.g., social media for information-seeking) and adapting interactions for virtual formats such as privacy prompts and non-verbal cue navigation.

Training should also cover digital ethics, adolescent rights, consent, online safeguarding, privacy-by-design and data protection to help providers build trust and reassure young people about confidentiality and safe use of digital systems. Continuing professional development (CPD) platforms and micro-learning approaches can support ongoing training in adolescent health, SRH, mental health, climate-health risks, digital determinants of health, digital ethics and emerging digital innovations affecting young people. These flexible learning approaches are particularly valuable in resource-constrained and remote settings, helping providers continuously update their skills and keep pace with evolving digital health tools and risks. Evidence from mobile-social learning interventions and micro-learning CPD applications shows that such approaches are acceptable to clinicians and well-suited to rapidly evolving fields such as digital health, adolescent mental health and data ethics (Guillaume et al., 2022; Slinger et al., 2025).

- **Preparing the workforce for multi-channel service delivery and building providers' confidence in digital health and AI solutions:** Digitally enabled care for young people often spans school-based services, community outreach, mobile clinics and online platforms. Governments should prepare providers to deliver coordinated care across these channels, ensuring seamless transitions between online and offline services as young people move between education, training and work environments.

Similarly, health workers' confidence in digital health systems is critical for sustained uptake, as when providers doubt reliability, usability or value, they often revert to paper records or avoid digital tools, undermining digital transformation and data quality. A 2024 systematic review and meta-analysis on digital health in low- and middle-income countries found that concerns about system stability, data quality, limited technical support and increased workload significantly reduced adoption, even where infrastructure existed (Wang et al., 2025). Evidence from trust and implementation studies indicates that comprehensive training, clear guidelines, visible leadership support and co-design with clinicians improve perceived usefulness and ease of use, thereby strengthening trust and willingness to integrate digital tools into routine care (Adjekum et al., 2018; Xiong et al., 2024).

- **Capacity building for educators, counsellors and training supervisors:** Teachers, counsellors and apprenticeship supervisors are often the first adults young people turn to for health concerns. However, many lack training in both health and digital health or in supporting youth who are experiencing sensitive issues such as depression, anxiety, contraceptive questions or issues relating to online harm. Governments should consider systematic capacity-building programmes that equip school and university staff with competencies in (digital) health, for example digital triage solutions and referral pathways, privacy-preserving communication with youth, mental-health first aid, SRH information navigation and safeguarding and use of AI-enabled tools aligned with ethical guidelines.

THE HOW

How a digitally enabled health system should be implemented with young people

Level 5

Level 6

Level 7

Level 8



Level 5



Young people's participation and governance

Young people are among the most frequent users of digital platforms, yet they are rarely involved in shaping how digital health services are designed, governed or evaluated (Third et al., 2021.; Yang, 2025). Evidence from global youth consultations indicates that services developed without young people's input often fail to reflect young people's lived experiences, communication preferences and expectations around privacy and trust, resulting in low uptake and limited confidence in public digital health systems (Raeside, 2025; Yang, 2025).

Beyond inclusion, youth participation is a critical governance mechanism that can strengthen system performance. Adolescents and young adults are well-positioned to identify usability gaps, exclusionary design choices and emerging digital risks that may not be visible through conventional monitoring processes. Consistent with the Global Initiative on Digital Health (GIDH), institutionalizing youth participation throughout the lifecycle of digital health initiatives – from strategy and design to implementation and evaluation – supports more transparent, responsive and accountable digital health governance, particularly for rapidly evolving youth needs.

What governments should consider

- **Institutionalizing youth participation in digital health governance:** Governments should establish formal youth councils or advisory bodies linked to ministries of health, digital health units or national eHealth agencies, while also integrating adolescents and young adults into digital health steering committees, ethics boards and data governance councils. Young people should have clearly defined roles in reviewing digital health strategies, products and services, advising on youth-facing solutions and identifying risks related to privacy, exclusion, misinformation and system safeguards to strengthen accountability and ensure youth perspectives shape system priorities and decision-making.
- **Institutionalizing co-design through human-centred design approaches:** Digital health services for young people should be co-designed with young people through structured design sprints, usability testing and iterative feedback cycles. Governments may require youth-testing protocols and impact assessments for digital health services, ensuring that interfaces, language, consent flows and escalation pathways are accessible, age-appropriate and culturally relevant and that any negative unintended consequences for young people are mitigated.

Level 6



Equity and accessibility

In most countries, access to healthcare has been restricted by two main factors: availability and affordability. The physical location of healthcare infrastructure and the corresponding distance between healthcare infrastructure and citizens has been one of the most obvious hurdles. Similarly, financial coverage of healthcare costs (either in the form of eligibility to use healthcare services or accessibility and affordability of health insurance schemes) has been a major factor for access to healthcare.

In a digitally enabled health system, digital channels can either help to improve equitable access to healthcare for young people or they can further deepen the divide by excluding certain segments of society. Therefore, it is important to design digitally enabled health systems in a way that they improve equity and accessibility.

Considering that societies consist of population groups with different needs and preferences, there is no one-size-fits-all solution when designing a digitally enabled health system.

What governments should consider

- **Uncovering the access needs and preferences of different population groups by using people-centred design methodology:** Digitally enabled health systems should be designed to avoid exacerbating existing inequities related to gender, disability, income, geography, language or connectivity barriers. The creation of, inclusive and systematic approach to identifying, prioritizing and selecting healthcare access channels can be achieved

by applying people-centred design methodology. For example, Stop TB Partnership successfully used this methodology when re-designing digitally enabled tuberculosis care services in Uganda and Vietnam. Based on the strong interest of ministries of health and other stakeholders, they codified the methodology and made it available as an easy-to-use people-centred design toolkit: <https://www.rtc.stoptb.org/rtc-toolkit/>

- **Think multi-channel as a main principle for the architecture of the digitally enabled health system – including digital and non-digital channels:** Equitable access requires that services are easily usable by all people, including young people. Naturally, this also includes young people in low-connectivity or socially disadvantaged settings. To reach these different social groups, a multi-channel strategy with both digital and non-digital channels is required. Countries should prioritize a multi-channel architecture (mobile, web, interactive voice response (IVR), short message service (SMS), pharmacies, schools, community health centres and health kiosks) as a crucial principle of their digitally enabled health system’s architecture. Furthermore, each channel needs to be multilingual to prevent exclusion of citizens based on language.
- **Adolescent-inclusive electronic health records (EHRs) with clear safeguards:** Governments should consider designing or refining national EHR systems so that adolescents are explicitly included as users in their own right, rather than treated as an extension of parental records. The creation of

EHRs for adolescents is crucial to ensure seamless continuity of access to digital health systems and healthcare services as they transition from paediatric to adult care. Well-designed EHRs can support continuity of care as young people move between school, university, vocational training and employment, reducing information loss and the need to repeatedly start over with new providers. However, literature highlights specific challenges for minors, including risks to confidentiality when parents or guardians have proxy access to online patient portals, difficulties segmenting sensitive data (e.g. SRH or mental health information) and legal variations in age of consent and access rights (Bayer et al., 2015; You et al., 2023). Solutions such as the Finnish or Estonian tiered access models where adolescents gain record access with electronic IDs and parental access is phased out based on maturity assessments, combined with clear consent frameworks, robust authentication and education initiatives, effectively protect adolescent privacy while supporting continuity and engagement in care (Hagström, Blease et al., 2024; Hagström et al., 2022; Hagström, Hägglund, et al., 2024).

Lever 7



Data security, privacy, safety and accountability

Digital health policies must uphold stringent privacy and data-protection standards. Legislators should enforce privacy-by-design protocols, algorithmic transparency and consent frameworks suited to young people, supported by independent oversight and accessible grievance-redress mechanisms.

Privacy, data security and accountability need to be cornerstones of the design of a digitally enabled health system, given the sensitivity of young people's health data. As mentioned above, a foundational element of a digitally enabled health system typically is a (national) longitudinal health record where different types of health data are stored securely over time. Other foundational elements of digitally enabled health systems are unique individual identifiers, identity management solutions or digital wallets and in some countries e-prescription or digital payment solutions that can

be used for healthcare services. Often, these solutions are established as digital public infrastructure – therefore, governments are well placed to ensure that they are designed and implemented with the needs of young people in mind.

During regional consultations with more than 600 young people aged under 30, from 80 countries, young people indicated that privacy, data security and accountability are of high priority for them. Young people strongly advocated for a values-based approach to health and a core set of six values forming the foundational pillars of a digitally enabled health system: 1. Equitable, 2. Trustworthy, 3. Humanistic, 4. Ethical, 5. Inclusive, 6. Accountable (DTH-Lab, 2025a). When designing and implementing digitally enabled health systems, these six values offer helpful guidance from both a technical and governance perspective.

What governments should consider

- **Strengthening transparency, ensuring accountability and establishing grievance-redress mechanisms to build trust:** For a digitally enabled health system to be trustworthy, transparency is required: Transparency – on who accesses (personal) health data, how information is being used and the decisions being taken about it – is a key feature, necessary for young people to improve their trust. This should be complemented by a mechanism where people can decide who gets access to their health data – ideally via management of granular health data access rights within the (national) electronic health record.
- **Enforcing youth-responsive AI governance and technical standards:** AI integration is already evolving rapidly and is becoming an important component of digitally enabled health systems, with growing applications across health service delivery, system efficiency and user engagement. To ensure that its adoption strengthens rather than fragments care, the integration of AI should be guided by a risk-tiered approach, based on both the level of direct clinical impact on patient health and the technical complexity of data required.

Similarly, there must be accessible, safe and youth-friendly channels for raising concerns, reporting harm, or seeking remedies. This may include digital ombudspersons, complaint mechanisms or independent review bodies with the authority to act on reported issues.

- **Embedding privacy-by-design and safety-by-design across digital health systems:** On a practical level, privacy-by-design approaches can be used for the design of digitally enabled health systems. Beyond trust, this could also have medical benefits: evidence shows that anonymity and discretion increase uptake and sustained engagement in digital-mental-health programmes (Lehtimaki et al., 2021). According to young people from the regional workshops, a digitally enabled health system should uphold data privacy, data solidarity and confidentiality if it is to attract young users.
- DTH-Lab conducted a global consultation with young people from 18 youth-led organizations to observe how they would rank different AI applications in healthcare based on risk. At the lower end of the spectrum, low-risk applications, such as administrative automation and provision of general health information can be more readily adopted to improve efficiency and expand access. Medium-risk applications, including digital triage tools and preventive health chatbots, offer greater potential to support early intervention and continuity of care, but require appropriate safeguards related to data quality, user protection and clear escalation pathways. At the higher end, high-risk applications such as diagnostics and clinical decision-support systems necessitate stringent regulatory oversight, robust validation and well-defined accountability mechanisms due to their direct implications for patient outcomes. Strategy for AI in Healthcare for India (SAHI) provides extensive guidance on this.

Adopting a risk-tiered approach would support stronger governance, regulation and redressal processes and also provides a practical roadmap for the gradual integration of AI into health systems. A phased progression from low to high-risk applications can enable capacity-building within the health workforce, generate early evidence of effectiveness and build trust among users and providers (Workum et al., 2026).

- **Establishing ethical governance structures:** Ethical considerations are important for young people to ensure that digital health solutions are developed and used in a way that respects the rights and dignity of patients, healthcare providers and other stakeholders. A growing concern for young people at regional and national levels is improved ethical governance. Young people called for governance guided by shared principles and values, rather than solely by legal or technical requirements.

Lever 8



Monitoring, evaluation and continuous improvement

Governments should institutionalize robust monitoring, evaluation and learning systems for the digitally enabled health system that integrate real-time data and participatory feedback of different population groups, including young people. Digital tools enable more timely monitoring and analysis and therefore reducing the delay before identified issues can be addressed. These systems should enable continuous assessment of accessibility/reach, user experience, quality, efficiency and trust, to support adaptive decision-making and sustained improvement more so than periodic reporting.

Insights from youth consultations conducted by DTH-Lab highlight the importance young people place on transparency, accountability and visible responsiveness. Young people want assurance that their feedback leads to tangible and prompt system improvements. Monitoring systems that integrate real-time data, participatory feedback and learning mechanisms can strengthen trust, improve service quality and enable more equitable health systems.

What governments should consider

- **Strengthening monitoring frameworks and decision-making cycles to reflect the perspective of young people:**

Governments should ensure that monitoring and evaluation frameworks for digitally enabled health systems meaningfully capture issues that matter to young people, including access, quality, trust, safety and continuity of care. This requires refining existing indicators or introducing complementary measures that reflect youth experiences across diverse contexts. Analysis of digital-service utilization trends, disaggregated by age, gender, geography and vulnerability, should be complemented by qualitative youth feedback.

Perspectives of young people should be systematically integrated into monitoring and reporting through age-appropriate feedback tools, participatory mechanisms and digital engagement channels. Embedding the insights of young people within routine performance reviews and planning processes strengthens responsiveness, supports adaptive management and ensures that services evolve in line with young people's needs and lived experiences.

- **Leveraging data for intelligence and system improvement:** Governments should move beyond static monitoring approaches and actively use

interoperable, real-time data systems to generate actionable intelligence for predictive decision-making and continuous system optimization. Integrating predictive analytics, machine learning, digital dashboards and interoperable data systems can help health systems shift from reactive reporting towards more proactive and adaptive models of care. Evidence demonstrates that these approaches can strengthen outbreak detection and early warning systems, improve patient-flow and workforce planning and enable earlier identification of emerging health risks (Adeleke, 2022; Ramos et al., 2024).

The use of AI-enabled and data-driven systems can further support continuous learning and improvement within digitally enabled health systems by helping providers anticipate risks, optimize service delivery and respond more rapidly to evolving health needs (Aerts & Bogdan-Martin, 2021). Interoperable systems and longitudinal datasets are particularly important to help ensure that insights can be generated across services and over time rather than remaining siloed within individual programmes or platforms. Realizing the benefits of data-driven and AI-enabled health systems requires sustained investment in interoperable infrastructure, high-quality data systems, workforce capacity, governance mechanisms and privacy protections, particularly in low- and middle-income countries where these gaps remain significant (Adeleke, 2022).

- **Expanding evaluation practices beyond systems to digital health solutions to ensure child safety:**

Governments should establish child- and adolescent-specific evaluation frameworks for digital health and

AI-enabled solutions to ensure that technologies deployed within health systems are safe, equitable and developmentally appropriate. Emerging evidence shows that existing AI evaluation and regulatory frameworks often fail to adequately address the unique ethical, clinical and developmental considerations associated with children and adolescents (Muralidharan et al., 2024). In response, newer frameworks such as ACCEPT-AI¹ have highlighted the importance of incorporating age-specific considerations, consent and assent processes, communication needs, equity and technological safeguards into the evaluation of pediatric AI systems (Muralidharan et al., 2024).

Evaluation processes should extend beyond technical performance and include continuous assessment of bias, unintended harms, safety risks and real-world clinical outcomes. Evidence indicates that AI tools used in child-focused contexts can be vulnerable to bias due to heterogeneous or unrepresentative datasets. This reinforces the need for larger, validated and contextually relevant data systems (Ciobanu, 2025). Governments should therefore require ongoing monitoring, independent safety audits, transparency mechanisms and human oversight throughout implementation. Evaluation frameworks should also assess whether digital health and AI systems support child rights, privacy, safety and equitable access, while ensuring that risks and unintended consequences are identified and mitigated before large-scale deployment (Magrabi et al., 2016).

¹ A framework of recommendations for the safe inclusion of pediatric data in artificial intelligence and machine learning (AI/ML) research. It has been built on fundamental ethical principles of pediatric and AI research and incorporates age, consent, assent, communication, equity, protection of data and technological considerations.

Checklist for national health leaders

What should a digitally enabled health system include to address the needs of young people?

- | | | |
|----------------|--|--|
| Lever 1 | Integrated digital health solutions | <input checked="" type="checkbox"/> Have you assessed whether the health system in your country provides the digital health solutions that young people need most, in a young person-friendly way? |
| Lever 2 | Digital health embedded in learning and training environments | <input checked="" type="checkbox"/> Are (digital) health-related services for young people embedded in the places where they learn and work, for example in schools, apprenticeships, community settings and universities? |
| Lever 3 | (Digital) health, AI and social media literacy | <input checked="" type="checkbox"/> Are young people being equipped with the digital, health and civic literacy and skills needed to be healthy in a digital world?
<input checked="" type="checkbox"/> How are social media and youth-facing AI chatbots regulated in your country to prevent negative impact on young people? |
| Lever 4 | Workforce capacity for young people's health | <input checked="" type="checkbox"/> Does the health workforce serving young people have the right balance of skills and knowledge – and do teachers and university counsellors have adequate knowledge of (digital) health? |

How should a digitally enabled health system be implemented to address the needs of young people?

- | | | |
|----------------|---|--|
| Lever 5 | Young people's participation and governance | <input checked="" type="checkbox"/> Is young people's participation ensured through the approach to design and governance of the digital health-related solutions created for them? |
| Lever 6 | Equity and accessibility | <input checked="" type="checkbox"/> Can young people easily access digital health solutions irrespective of their location or connectivity levels? |
| Lever 7 | Data security and privacy, safety and accountability | <input checked="" type="checkbox"/> Do digital health policies address the stringent privacy and data-protection standards that are required for young people? |
| Lever 8 | Monitoring, evaluation and continuous improvement | <input checked="" type="checkbox"/> Are there monitoring systems in place to evaluate the effectiveness, efficiency, safety and accessibility of relevant digital health solutions for young people? |

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About DTH-Lab

DTH-Lab is a global consortium of partners working to drive implementation of The Lancet and Financial Times Commission on Governing Health Futures 2030's recommendations for value-based digital transformations for health co-created with young people. DTH-Lab operates through a distributive governance model, led by three core partners: Ashoka University (India), DTH-Lab (hosted by the University of Geneva, Switzerland) and PharmAccess (Nigeria).

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