DIGITAL TRANSFORMATIONS FOR HEALTH LAB

GOVERNING HEALTH FUTURES 2030

Digital childhood profiles 2026

Faith Murage, February 2026

This report has been made possible by financial contribution from Fondation Botnar, Switzerland, to the Project IMG-22-005 “Digital Transformations of Health Lab (DTH-Lab). Their commitment to advancing global health is deeply appreciated, and this project would not have been possible without their contribution. DTH-Lab is hosted by Université de Genève (UNIGE), Switzerland. DTH-Lab is committed to ensuring and enabling Global Access. The knowledge and information gained from the Project will be promptly and broadly disseminated and its ‘Funded Developments’ will be made available and accessible free of costs. The Global Access Commitments will survive the term of the Project.

Suggested citation: Murage, F. (2026). Digital childhood profiles 2026. Geneva: Digital Transformations for Health Lab.

CONTENTS

1. INTRODUCTION

Digital technologies such as the Internet, mobile devices and social media shape how children and young people access information, connect, learn and seek care. Policymakers should note that one in three global Internet users is a child and nearly 75 per cent of adolescents aged 15–19 own a mobile phone. With over 2.5 billion of the world's population being under 20, there is an urgent need for informed policy to address how digital ecosystems, including interconnected services, platforms and tools, influence the health and well-being of this age group (UNICEF, 2023).

The global digital landscape offers high connectivity but uneven access. According to the Digital 2025 Global Overview, 5.56 billion people use the Internet and 5.24 billion have active social media accounts (DataReportal, 2025. Young people widely use platforms such as YouTube, TikTok and Instagram for entertainment, information and informal learning. These activities influence health behaviours, including help-seeking, diet, sleep and physical activity (Ortiz-Ospina, 2019; Smahel et al., 2025).

Digital transformations present both opportunities and risks. They support health promotion, expand access to services and enable peer support and youth participation in health governance (Kickbusch et al., 2021). However, children also face harmful content, cyberbullying, addictive designs, data extraction and discrimination, often in digital environments not designed to protect their rights.

Facilitated by the Digital Transformations for Health (DTH-Lab) fellowship programme, this project seeks to inform policy by updating the digital childhood typology first developed in 2021 for the Lancet and Financial Times Commission on Governing Health Futures 2030 (Kickbusch et al., 2021) to integrate current evidence on digital determinants of health. This report synthesises the literature and proposes revised digital profiles to inform actions to address access inequalities, children's digital experiences and emerging factors such as artificial intelligence.

2. METHODOLOGY

The updated digital childhood profiles are based on a desk-based review. In this context, “desk-based review” refers to research conducted by collecting and analysing existing published information, rather than generating new data. This review used a structured matrix to compare evidence. Methodological steps included: identifying sources, extracting relevant data and systematically comparing academic articles, institutional reports and datasets published between 2019 and 2025. The datasets were selected for their:

- Focus on children, adolescents, or youth under 25
- Relevance to digital access, use, risks or impacts on health and well-being
- Inclusion of digital determinants such as connectivity, platforms, artificial intelligence (AI) and digital health services
- Attention to vulnerable or marginalised groups where possible
- Availability in English

In total, 20 core documents were systematically mapped into an Excel-based review matrix. The matrix captured the following standard elements in each core document:

- Citation (APA)
- Country or region/context
- Digital determinants identified
- Impacts on children and young people
- Vulnerable populations
- Policy and practice implications
- Evidence and data gaps

Key sources included UNICEF’s analysis of the digital divide, regional evidence on digital health for children and young people, work on digital inclusion, global mobile gender gap data and conceptual work on digital determinants of health. An earlier fellowship stage literature review progress report supported the synthesis. No interviews or primary data collection were conducted; the focus remained on consolidating secondary evidence and clarifying patterns of digital determinants relevant to childhood experience typologies. Draft profiles were shared with DTH-Lab staff and their Regional Youth Champions for review and input.

3. SUMMARY OF FINDINGS

3.1 Digital determinants of health

Across the reviewed literature, digital determinants of children's health and well-being cluster around the following domains:

3.1.1 Access and use

- Availability and affordability of Internet connectivity
- Device ownership and sharing (especially mobile phones)
- Age of first exposure to digital technologies
- Level of digital literacy and confidence online

Studies by UNICEF (2023), GSMA (2025) and Prakash,(2025) show that connectivity and device access are unevenly distributed across income, geography and gender. Children in low- and middle-income countries, rural areas and poorer households are consistently disadvantaged. World Bank Data360 and International Telecommunications Union (ITU) DataHub indicators drawing their conclusions from the UNCTDAD data centre further confirm that, while 3G and higher network coverage has expanded globally, substantial gaps remain between and within countries. Gaps are especially seen in rural and low-income settings (*UNCTADStat Data Centre*, n.d.).

At school level, the work of the United Nations Educational, Scientific and Cultural Organization (UNESCO) on digital and AI readiness indicates that high-income countries are more likely to have connected schools and structured teacher training in digital tools. In contrast, many low- and middle-income countries still face infrastructure, capacity and skills gaps (UNESCO, 2025). These education initiatives are highly relevant to health. Schools are central settings where children can access digital health information, skills and services.

3.1.2 Risks and harms

- Exposure to harmful content (e.g., self-harm, eating disorders, sexual content, hate speech)
- Cyberbullying and online abuse
- Addictive or manipulative design features
- Data harvesting, surveillance and privacy breaches

Evidence links exposure to digital risks, such as online sexual abuse or bullying, to poor mental health outcomes, especially for adolescents (Yelizarova et al., 2025).Whilst developments in digital technologies can promote children's rights, they can also present new threats, placing greater emphasis on the need to protect children as digital health expands.

3.1.3 Engagement patterns

- Screen time and time spent on social media
- Types of platforms and content used
- Motivations for use (for example, information, socialising, news, entertainment)

Research indicates that the impact of social media use on well-being is nuanced and reciprocal, rather than linearly associated with time spent online. The nature and quality of children's online experiences, rather than the duration of online engagement, matter most. Platform use is increasingly diverse and integrated into daily life (Smahel et al., 2025).

3.1.4 Sociocultural and structural moderators

- Gender norms and intra-household dynamics
- Parental mediation and digital parenting styles
- Socioeconomic status, rural-urban location and education
- National regulation and platform governance

Structural factors such as gender, poverty and education drive disparities in digital opportunities and vulnerabilities. High-income countries demonstrate stronger digital well-being outcomes, while barriers in low-income contexts determine which children benefit or remain at risk as documented by sync global.

3.2 Access to digital health services as a determinant

Access to digital health services is a key digital determinant of health for children and young people. It includes not only connectivity but also the ability to use digital tools for health needs such as mental health support, vaccination reminders, telehealth nutrition and sexual and reproductive health education (UNICEF, 2023).

UNICEF (2023) reports that, in low- and middle-income countries, especially among poorer households, children have less reliable Internet access and fewer devices. This limits their use of digital health platforms. The State of the World's Children 2024

highlights the potential of digital technologies to reach marginalised children. However, many still lack the required connectivity, device access and protections (UNICEF, 2024). Schools are often underused for digital health. Regardless of connectivity levels, the regular use of digital tools for learning and health education remains limited, which constrains skill development (Artificial Intelligence in Education, 2026a)

Prakash adds that rural residence, low income and gender norms further reduce adolescents' ability to access and benefit from digital services (Prakash,2025).Adolescent girls may be more restricted in device ownership and online activity due to the parental controls put in place to monitor their activities online and younger children depend on adult gatekeepers who may not prioritize digital health. World Bank Data360 connectivity data and ITU child-focused ICT indicators underscore that these patterns are not isolated. They are part of wider gaps in infrastructure and affordability that limit the meaningful use of digital services in many low- and middle-income countries as they draw conclusions from the UNCTAD data centre (UNCTADStat Data Centre, n.d.)

Alongside these structural barriers, global health guidance has begun to influence what constitutes effective and equitable digital health interventions as expounded by The World Health Organization's 2019 recommendations on digital interventions for health system strengthening describe how digital tools such as client reminders, telemedicine, digital provider decision support and targeted communication can widen the reach of health promotion and services if they are integrated into health systems and designed with equity, privacy and data protection in mind (DHI, 2019). For children and adolescents, this means that digital health access is not only about whether they can access the Internet, but also about whether the systems they encounter are designed to protect their rights, respond to their needs and be usable in real-life contexts.

The WHO's Regional Office for Europe notes that adolescents increasingly use digital platforms to seek mental health information, join peer support communities and find resources that may not be available offline (DHI, 2019). These spaces can support early help-seeking and social connection, but they can also expose young people to misleading or harmful content if not well-moderated. Van Kessel et al. (2025) argues that digitally enabled, data-driven health systems can help reduce inequities and improve quality of care, especially for younger, more digitally-connected populations, but only if access barriers and safety concerns are addressed.

Taken together, the literature and dataset findings suggest a dual challenge: in high-connectivity settings, children and young people may have expanding opportunities to use digital health tools but face heightened exposure to commercial, algorithmic and content-related risks, whilst in low-connectivity settings children are mostly excluded from digital health opportunities altogether. Both trajectories risk widening global inequalities in child health and well-being, if not addressed.

3.3 Artificial intelligence as a digital determinant

Artificial intelligence (AI) is rapidly becoming part of the everyday digital environment in which children and young people live. The Digital 2025 Global Overview analysis indicates that AI tools such as ChatGPT and Google's Gemini have reached tens to hundreds of millions of active users, with ChatGPT alone attracting more than 300 million unique visitors per month on the web by late 2024 (Idcom & Idcom, 2025)

Key findings show that while AI can enhance personal care, early diagnosis, and health system efficiency for young people, it also poses significant risks. These include the reinforcing of existing inequalities, perpetuating a lack of transparency and new forms of digital influence on health (Pokorny & Bartl-Pokorny, 2025)

From the perspective of children, this means that AI increasingly shapes the information that they see, the health resources that they are nudged toward or away from and how digital health systems assess and respond to their needs (Pokorny & Bartl-Pokorny, 2025)Children in highly-connected, high-income environments are more likely to encounter AI-mediated health experiences, while those in low-connectivity settings may be largely excluded from them. Therefore, the most digitally active children, who are by implication also the children who benefit the most from digital technology, may also be the most exposed to AI-driven harms, including profiling and targeted advertising (van Kessel et al., 2025).

4. PROPOSAL FOR UPDATED PROFILES

Building on the original 2021 digital childhood typology and updated evidence from this review, six revised digital childhood profiles are emerging. These are not fixed labels for individual children, but lenses to describe common patterns in how digital determinants cluster in different contexts.

1. Digitally invisible

Children with limited or no access to connectivity, devices or digital skills due to structural inequities such as weak infrastructure or financial barriers are digitally invisible. They are largely absent from digital health services and rely almost entirely on offline care and information. This profile is more common in rural, low-income or marginalised communities, particularly in low- and middle-income countries. In remote areas and among groups such as indigenous or impoverished households, Internet penetration often falls below 20 per cent and device ownership is shared or nonexistent.

These children face “digital exclusion traps”, missing out on telemedicine, health apps, remote learning and crisis alerts (e.g., during pandemics) which exacerbates health disparities like delayed vaccinations or untreated malnutrition. Globally, ~1.5 billion youth under 25 lack meaningful Internet access, widening gaps in skills for future jobs and civic participation. To bridge this divide, interventions must prioritize affordable connectivity, access to shared school devices and health tools adapted for offline use.

2. Digitally guardrailed

Children who have some access to devices and the Internet, but under close adult control, with strong restrictions on time, content or platforms can be described as digitally guardrailed. These restrictions may be driven by parental safety concerns, gender norms or political decisions. These children may benefit from the protection against some online harms but will have fewer opportunities to develop independent digital skills or to engage directly with digital health resources. Parents often impose guardrails out of safety concerns, such as to prevent exposure to inappropriate content or online risks, with over 80 per cent using controls like screen time locks or social media bans until the ages of 13–16. Gender norms, especially in conservative or low- and middle-income contexts, result in tighter restrictions for girls, often limiting device ownership and unsupervised access. Political and regulatory factors, including laws like the UK’s Online Safety Act 2023 and the EU Digital Services Act 2022, mandate age verification and content filters to protect minors. Religious and cultural values may also drive restrictions, with families blocking platforms that conflict with moral codes or enforcing bans during school and

prayer hours. Academic priorities lead schools and parents to limit recreational use to protect study time, sleep and cognitive development. While these guardrails – a combination of technology, policy and family mediation – seek to protect children, overly rigid approaches may hinder digital fluency.

3. Digitally fluid

Digitally fluid children and adolescents move comfortably between online and offline spaces, have moderate access and relatively supportive environments. They use digital tools for school, socialising and some health-related information, but their experiences are shaped by inconsistent access and platform design as well as social norms.They use apps for homework (e.g., Google Classroom), casual chatting on Snapchat or TikTok, and basic health queries like symptom checkers, averaging 3-5 hours daily online. Platform algorithms often dictate content, exposing them to unfiltered trends or misinformation, while social norms (e.g., peer pressure to join group chats) amplify anxiety. Supportive homes provide guidance, yet gaps like data costs or school Wi-Fi limits hinder consistency, fostering fragmented habits rather than deep skill-building.

4. Digitally saturated

Young people with high levels of connectivity and device access, often in urban or high-income contexts, spend substantial portions of their day online and become digitally saturated. They have greater access to digital health services. However, they are also at greater risk of exposure to harmful content, addictive platform design and algorithmic pressures, particularly around body image and mental health.

5. Digitally adaptive/autonomous

Digitally adaptive or autonomous adolescents and young adults have relatively strong digital literacy and some agency over their technology use. They actively curate their feeds by blocking different ads, blocking toxic and unwanted pages, seek out health information like period tracker apps, and may use digital tools to self-manage aspects of their mental or physical health like Samsung Health, while still navigating risk.

6. Digitally influential

Young people who create content, moderate communities, or otherwise shape digital spaces that others rely on can be described as digital influencers. They may act as informal health messengers or peer supporters, sometimes without formal training or

support. Their role highlights both the opportunities and the responsibilities associated with youth-led digital spaces. These influencers adeptly navigate digital risks through advanced skills in privacy settings, content moderation and risk recognition, distinguishing credible health info from misinformation while sidestepping cyberbullying, predatory direct messages (DMs) and algorithmic traps that ensnare less savvy peers. By curating safe communities (e.g., mental health-themed Discord servers, TikTok wellness challenges), they model resilience, turning potential harms into opportunities for teaching and advocacy for example, a teacher explaining different concepts of a certain subject and instances of period health advocacy going on in the media that empower broader networks of digitally vulnerable children.

5. REFLECTIONS AND RECOMMENDATIONS

The six updated digital childhood profiles have evolved from the original 2021 Lancet and Financial Times typology by incorporating evidence from 2022 onwards on AI integration, digital health access disparities and nuanced engagement patterns. Previous profiles emphasized broad access divides. These revisions add granularity, for example using the term "guardrailed" instead of "restricted" to accommodate reference to family mediation interventions, as well as legally imposed ones. The concept of digital saturation is broken down into different overexposure risks and the term "influential" is introduced, referring to youth agency in content creation and peer support. The realities of low- and middle-income countries (LMIC) are foregrounded, along with the influence of gender norms and algorithmic harms, which were absent from earlier frameworks.

Preliminary reflections from this phase highlight several priorities for stakeholders – such as health ministries, tech platforms, UNICEF, WHO, schools and parents – including the need to:

1. Provide centres for young people in digital health governance. Many frameworks acknowledge children as a vulnerable group, but fewer treat them as active stakeholders. There is a need to embed youth voices into the design of digital health tools and policies (Kickbusch et al., 2021).
2. Treat access to digital health services as a core determinant of health. Connectivity, affordability and digital skills are foundational, but access to safe, age-appropriate digital health services needs to be more explicitly recognized and measured, particularly in LMICs (Chaudhary et al., 2024).
3. Engage with AI explicitly. AI is not a future concern but a present determinant shaping children's digital health experiences through generating recommendations, triage systems and automated decision-making (van Kessel et al., 2025). Policy frameworks should reflect this.
4. Address evidence gaps. There is still limited longitudinal evidence, underrepresentation of LMICs and relatively little focus on positive and protective digital experiences. More nuanced research is needed as to how specific groups of children experience digital determinants differently.

REFERENCES

Anderson, M., Pitchforth, E., Asaria, M., Brayne, C., Casadei, B., Charlesworth, A., Coulter, A., Franklin, B. D., Donaldson, C., Drummond, M., Dunnell, K., Foster, M., Hussey, R., Johnson, P., Johnston-Webber, C., Knapp, M., Lavery, G., Longley, M., Clark, J. M., . . . Mossialos, E. (2021). LSE–Lancet commission on the future of the NHS: re-laying the foundations for an equitable and efficient health and care service after COVID-19. *The Lancet*, *397*(10288), 1915–1978. https://doi.org/10.1016/s0140-6736(21)00232-4

Artificial intelligence in education. (2026a, January 19). AI | UNESCO. https://www.unesco.org/en/digital-education/artificial-intelligence

Banerjee, P. (2025). *Digital Interventions for Youth Health: Insights from a Comprehensive Scoping Review*. Digital Transformations for Health Lab. Geneva. https://dthlab.org/wp-content/uploads/2025/01/Preetika-Banerjee-Digital-Interventions-for-Youth-Health.pdf

Kemp., S. (2025) . *Digital 2025: Global overview report.* DataReportal, in partnership with We Are Social and Meltwater. https://datareportal.com/reports/digital-2025-global-overview-report

Digital Health and Innovation (DHI). (2019, June 6). Recommendations on digital interventions for health system strengthening. https://www.who.int/publications/i/item/9789241550505

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., Eirug, A., Galanos, V., Ilavarasan, P. V., Janssen, M., Jones, P., Kar, A. K., Kizgin, H., Kronemann, B., Lal, B., Lucini, B., .Medaglia, R., Williams, M. D. (2019). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, *57*, Article 101994. https://doi.org/10.1016/j.ijinfomgt.2019.08.002

GSMA. (2025). *The mobile gender gap report 2025.* https://www.gsma.com/mobilefordevelopment/resources/the-mobile-gender-gap-report-2025/

Idcom, & Idcom. (2025, April 29). Digital 2025 – Global Overview Report - IDCOM. IDCOM - Business transformation driven by data. https://idcom.us/digital-2025-global-overview-report/

Statistics. (n.d.). ITU. https://www.itu.int/en/ITU-D/Statistics/pages/stat/default.aspx

Kickbusch, I., Piselli, D., Agrawal, A., Balicer, R., Banner, O., Adelhardt, M., Capobianco, E., Fabian, C., Gill, A. S., Lupton, D., Medhora, R. P., Ndili, N., Ryś, A., Sambuli, N., Settle, D., Swaminathan, S., Morales, J. V., Wolpert, M., Wyckoff, A. W., Wong, B. L. H. (2021). The Lancet and Financial Times Commission on governing health futures 2030: growing up in a digital world. *The Lancet*, *398*(10312), 1727–1776. https://doi.org/10.1016/s0140-6736(21)01824-9

Pokorny, F. B., & Bartl-Pokorny, K. D. (2025). Editorial: Artificial intelligence for child health and wellbeing. Frontiers in Digital Health, *7*, 1685788. https://doi.org/10.3389/fdgth.2025.1685788

Prakash, O. (2025). Is it time for India to set social media age limits for adolescents? Indian Journal of Psychiatry, 67(2), 267–273. https://doi.org/10.4103/indianjpsychiatry.indianjpsychiatry_1012_24

Ortiz-Ospina, E. (2019). Are Facebook and other social media platforms bad for our well-being? *Our World in Data*. https://ourworldindata.org/social-media-wellbeing

Smahel, D., Lebedikova, M., Lacko, D., Kvardova, N., Mýlek, V., Tkaczyk, M., Svestkova, A., Gulec, H., Hrdina, M., Machackova, H., & Dedkova, L. (2025). *Tech & teens: Insights from 15 studies on ICT's impact on well-being*. EU Kids Online. . https://doi.org/10.21953/lse.g4asyqkcrum7

SYNC Global. (n.d.). Global digital wellbeing index. https://www.syncglobal.com/digital-wellbeing-index

UNCTADStat Data Centre. (n.d.). https://unctadstat.unctad.org/datacentre/

United Nations Children's Fund (UNICEF). (2023). *Children and the digital divide.* UNICEF Innocenti - Global Office of Research and Foresight. https://www.unicef.org/globalinsight/reports/children-digital-divide

United Nations Children's Fund (UNICEF). (2024) State of the World's Children. https://www.unicef.org/reports/state-of-worlds-children/2024

Van Kessel, R., Seghers, L., Anderson, M., Schutte, N., Monti, G., Haig, M., Schmidt, J., Wharton, G., Roman-Urrestarazu, A., Larrain, B., Sapanel, Y., Stüwe, L., Bourbonneux, A., Yoon, J., Lee, M., Paccoud, I., Borga, L., Ndili, N., Sutherland, E., . . . Mossialo, E. (2025). A scoping review and expert consensus on digital determinants of health. *Bulletin of the World Health Organisation*, *103*(02), 110-125H. https://doi.org/10.2471/blt.24.292057

Yelizarova, O., Stankevych, T., Parats, A., Yelizarov, V., Puzanova, O., Lebedynets, N., Hozak, S. (2025). Digital exposure in early childhood: Health risks and protective strategies. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*. *62*. https://doi.org/10.1177/00469580251390766

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).

Leadership Team

Aferdita Bytyqi, DTH-Lab Executive Director and Founding Member.

Ilona Kickbusch, DTH-Lab Director and Founding Member.

Anurag Agrawal, DTH-Lab Founding Member. Dean of Biosciences and Health Research, Ashoka University.

Rohinton Medhora, DTH-Lab Founding Member. Professor of Practice, McGill University's Institute for the Study of International Development.

Njide Ndili, DTH-Lab Founding Member. Country Director for PharmAccess Nigeria.

DIGITAL TRANSFORMATIONS FOR HEALTH LAB

GOVERNING HEALTH FUTURES 2030

Digital Transformations for Health Lab (DTH-Lab)
Hosted by: The University of Geneva
Campus Biotech, Chemin des Mines 9
1202 Geneva, Switzerland

www.DTHLab.org