Developing an Evidence Guide to Strengthen Public Investment Decisions for Digital Health Technologies in Low- and Middle-Income Countries

Prepared by: Health Intervention and Technology Assessment Program Foundation (HITAP), Hitotsubashi Institute for Advanced Study (HIAS), Department of Tropical Hygiene & Mahidol-Oxford Tropical Medicine Research Unit (MORU), Center of Excellence for Pharmaceutical Care Innovation Universitas Padjajaran (UNPAD) as a part of World Health Organization Asia-Pacific Observatory (WHO APO) Consortium on Digital Health.

Background

Digital health technologies (e.g., wearables, electronic health records, and artificial intelligence tools) are increasingly recognized for their potential to enhance care quality, efficiency, and reach of healthcare services while potentially reducing costs [1]. Landscape reviews have shown increasing investments by governments and other stakeholders in developing digital health technologies. However, there remains a need to assess the value of these rapidly evolving technologies, taking into account that different evidence is needed for different categories of digital health technologies and at different stages of technology maturity, and the need to strike a balance between innovation, affordability, and long-term sustainability [2].

Policymakers often struggle to address these questions using current methods and priority-setting processes, given the unique characteristics of digital health technologies. Evidence is frequently incomplete [3], only applicable to specific settings, highly heterogeneous, or quickly outdated, making it difficult to determine the value of the technology. For low- and middle-income countries (LMIC), these challenges are more prominent, given the limitations in data systems and governance, interoperability within fragile digital ecosystems, and additional barriers such as geographical challenges, cultural acceptability, workforce readiness, regulatory gaps, and limited research, financial, and implementation capacities further complicate the landscape [4-6].

Value frameworks provide a structured, transparent approach to guide evidence production [7,8]. Although some value frameworks to assess digital health technologies exist [9-12], they tend to be country-specific, intended for use in some high-income countries, and few are fully operationalized. Moreover, limited consensus on digital health technology classification further complicates the operationalization. For example, the National Institute for Health and Care Excellence (NICE) evidence standard framework for digital health technologies developed a classification system based on risk level and intended use, and outlines the evidence requirements for each category [12], whereas the World Health Organization (WHO) classification is based on how these technologies address individual and health system needs and advance health goals [13]. Therefore, there is an opportunity to address the gap in operationalizing frameworks in practice, and further assessment is needed to understand applicability to LMIC settings.

Demand for practical, context-appropriate frameworks, along with operationalization guidance (i.e. what evidence is required to demonstrate each value domain for which type of technology), has grown among LMIC policymakers. Thailand's ongoing development of guidance for evaluating digital health

technologies, intended for inclusion in its national health technology assessment guidelines, illustrates the demand to adapt, refine, and operationalize existing frameworks to better align with LMIC contexts.

Overview of the work, objectives, and expected outcomes

We propose an evidence guide, comprised of an adapted or newly developed value framework and a newly developed implementation guide, to operationalize the value framework domains. This evidence guide will help to assess the value of digital health technologies for public investment, highlighting elements of evidence or decision-making criteria that may differ from traditional approaches in health technology assessment (HTA) or used in other settings (for example, high-income countries). This evidence guide aims to bridge methodological rigor with operational realities in lower-resource settings, offering pragmatic guidance for governments seeking to adopt digital health technology innovations.

The value framework will identify which types of evidence are most helpful at different stages of the digital health product lifecycle. The implementation guide will then set out the principles for producing the evidence, considering different options that may be possible in limited-resource contexts. The evidence guide will be designed for policymakers and researchers, providing a structured, adaptable, and practical resource that offers a menu of evidence and evaluation options suited to different levels of data maturity, resource capacity, and investment goals. It is that in subsequent phases of the project, which are beyond the scope of this proposal, case studies in selected LMICs will evaluate the real-world applicability of the evidence guide and refine the guide based on learnings.

This work will contribute to the broader regional and global health agenda by supporting the ASEAN recommendations on Transforming the Digital Health Landscape [14], WHO Global Strategy on Digital Health and advancing Sustainable Development Goal 3.8 on Universal Health Coverage through equitable and efficient technology adoption.

Policy questions to be addressed

This work is motivated by policy questions raised by LMIC governments through informal discussions and will be refined through consultation with an advisory group (see proposed approach, resources, and timeline). Work Packages 1 and 2 of the work will provide structured ways to address the following key questions:

1. How to assess the value of digital health technology to support decisions about its adoption, scale-up, or integration into the health system within LMIC contexts?
2. What methods and outcome measures are appropriate for generating the evidence?

Proposed approach, resources, and timeline

The proposed work will be delivered through four work packages, with this proposal covering Work Packages 1 and 2. Work Packages 3 and 4 (case studies and guide revision) will be conducted in subsequent phases of the project, once additional resources have been secured. Each work package builds on the findings of the previous work packages, allowing for iterative learning and refinement.

An Advisory Group will be convened, comprising digital health and policymaker experts (primarily seeded from our consortia's networks e.g. HTAsiaLink and SAPPHIRE, along with nominations from WHO APO), to provide oversight and guidance across all work packages. The group is expected to have no more than 10 members. Details of the Advisory Group are explained below. **Table 1** summarizes the objectives, methods, outputs, and timelines for each work package.

Work packages

Work Package 1: Review and comparative analysis of current value frameworks and consensus workshop

Work Package 1 will identify, compare, and map existing value frameworks for digital health technologies. This includes examining their structure, scope or intended use (including type and lifecycle of technology), target users, value domains, evidence requirements, methodological approaches used globally, and documented limitations. The analysis will focus on the key similarities and differences between frameworks to understand what type of evidence is needed for which type of digital health technologies at which stage of development.

Given the limited consensus on the taxonomy for assessing digital health technologies and the use of different taxonomies across countries, our work will map the taxonomies used in value frameworks and seek to ensure that the evidence guide is flexible to different taxonomies that may be in place at the country level.

A Delphi panel of subject-matter experts will be convened to assess the relevance of the findings, particularly for LMICs (e.g., whether current value frameworks account for constraints commonly faced in LMICs). Experts include researchers with extensive experience in evaluating digital health technologies for government policy (i.e., digital health technology experts), researchers responsible for producing such evidence for digital health in LMICs, and policymakers in LMICs, particularly those involved in evidence deliberation when introducing the technology to the public program. The results of this Delphi will then be reviewed and discussed by the Advisory Group for finalization.

Results of the Work Package 1 and inputs from the Advisory Group will guide the workflow in Work Package 2. Specifically, Work Package 1 will clarify whether (a) an existing value framework is fit for purpose, (b) one or more existing frameworks are promising but require adaptation, or (c) no suitable framework currently exists. In the case that (a) an existing value framework is fit-for-purpose, we will proceed directly to developing the implementation guide in Work Package 2. In the case that (b) one or more frameworks are promising but require adaptation, then Work Package 2 will consist of first refining, integrating, and/or contextualizing the value framework(s) followed by developing the implementation

guide. In the case of (c) where no existing framework is suitable, Work Package 2 will consist of developing a new LMIC-focused value framework, followed by developing the implementation guide.

Work Package 2: Refining the framework and developing the implementation guide

Work Package 2 is an essential component of the project and will be undertaken in all scenarios, with Work Package 1 shaping the specific activities to be conducted. In Work Package 2, the team will use or adapt an existing framework or develop a new framework (based on our preliminary scoping work, developing a new framework is the least likely scenario), and then adapt or develop methodological tools and approaches to operationalize framework domains, conduct targeted literature reviews to fill evidence gaps, and draft the implementation guide.

The proposed outline for the implementation guide includes a) translating policy questions into research questions, b) identifying appropriate evidence by technology type and maturity, c) examples of the evidence, and d) communicating results for policy use. The guide is intended to be flexible, to allow countries adapt it to their institutional and resource contexts.

Advisory Group

An Advisory Group will be convened to ensure policy relevance and flexibility of the evidence guide across LMICs settings. This group will provide direction to the work and is expected to support the dissemination of report(s). Members will consist of policy and digital health experts, with a maximum of 10 individuals.

Members of the advisory group will serve voluntarily. We will consult with our consortia networks (for example, HTAsiaLink, SAPPHIRE and WHO APO) to seek nominations for advisory group members and we will consult with WHO APO for review of nominees and for further suggestions. We aim to ensure diverse representation from policymaking, technical, and implementation perspectives, notably to understand perspectives from LMICs.

The advisory group will be engaged through a combination of in-person and virtual meetings and email to ensure continuous communication throughout the project. A minimum of four meetings will be held, with two being held in person:

1) a kick-off meeting to consult on the project scope and design (including the refinement of the policy and research question and country/jurisdiction scope) and agree on the expectations for their roles (virtual meeting),

2) a meeting at the end of Work Package 1 to review findings and guide the decision on whether to adapt, adopt, or develop a new framework (in-person meeting),

3) ad-hoc consultation(s) at key milestones (virtual meetings), and

4) final consultation to share feedback on the draft framework and implementation guide at the end of Work Package 2 (in-person meeting).

Between meetings, members will be invited to provide written feedback on analyses and draft documents. HITAP will act as the secretariat of this Advisory Group.

Table 1. Work packages and timeline

Work Package	Objective(s)	Brief of key activities	Timeline
1. Review and comparative analysis of current value frameworks and consensus workshop	• Understand taxonomies of and value frameworks for digital health technologies investment in public sector. • Assess suitability of the frameworks for LMICs settings. • Identify methodological gaps to assess each value, especially where existing approaches are absent or underdeveloped for digital health technologies.	• Establish an advisory group (policymakers, academia, implementers)* • Conduct a literature review • Map and compare existing value frameworks • Conduct consensus panel (e.g., Delphi)	Up to October 2026
2. Refine framework and develop implementation guide to operationalize the value framework	Adapt/develop a value framework for LMICs and an accompanying implementation guide	• In-person advisory group meeting • Adapt or develop the value framework • Conduct a targeted literature review to fill methodological gaps • Develop implementation guide • Conduct online survey with potential users to check usability and flexibility of the implementation guide	October 2026 – September 2027
Outside of the scope of this concept note			
3. Application and testing through case study(ies)	Test the value framework and implementation guide through real-world application.	• Implement case studies in selected countries or programs • Collect feedback from policymakers, implementers, and innovators	12 months per case study
4. Validation and refinement	Validate and refine the value framework and implementation guide using feedback from case studies and stakeholder consultation.	• Refine the framework from feedback from users and case study reports. • Conduct stakeholder consultations. • Knowledge translation/dissemination activities.	6 months

*The advisory group will be established for the overall work packages (not limited to work package 1)

**Outputs will be disseminated through multiple channels/platforms (e.g., webinar, social media, etc.), and the type of outputs could be discussed at a later stage.

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