Global Digital Health Summit
Washington DC
2016

A Recent History of Digital Health from the World Health Organization

Dr. Garrett Mehl, Department of Reproductive Health and Research

November 11, 2015

WHO Global eHealth Evaluation Meeting Consensus Statement Bellagio Call to Action

"**Evidence** equips decision makers with **information for choosing** the most effective and economical approaches to systems, strategies, implementation and training in m/eHealth."

Call to Action on Global eHealth Evaluation

Consensus Statement of the WHO Global eHealth Evaluation Meeting, Bellagio, September 2011

"To improve health and reduce health inequalities, rigorous evaluation of eHealth is necessary to generate evidence and promote the appropriate integration and use of technologies."

ehealth evaluation vidence

September 9th, 2011

The Bellagio eHealth Evaluation Group

Convened by the World Health Organization and Partners In Health

ehealth evaluation vidence

Jointly convened by Harvard University, and World Health Organization

(Fraser, Bailey, Mehl)

WHO Bellagio eHealth Evaluation Call to action, Bellagio, Italy, September, 2011

informed by rigorous and focused evaluation. Used appropriately, eHealth has the potential to catalyze, support and monitor health improvements at scale, and to accelerate achievement of national and global development goals, including the United Nations Millennium Development Goals. **If used improperly, eHealth may divert valuable resources and evencause harm.** To ensure effective and appropriate use of eHealth systems, implementation must be guided by evidence from evaluations at all design and scale-up stages. A small set of studies has shown positive impact of eHealthsolutions in resource-poor environments but more evidence, of better quality, is needed to make the health and investment case for scale-up.

Bellagio Call to Action 2011

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If used improperly, eHealth may divert valuable resources and even cause harm… implementation must be guided by evidence…

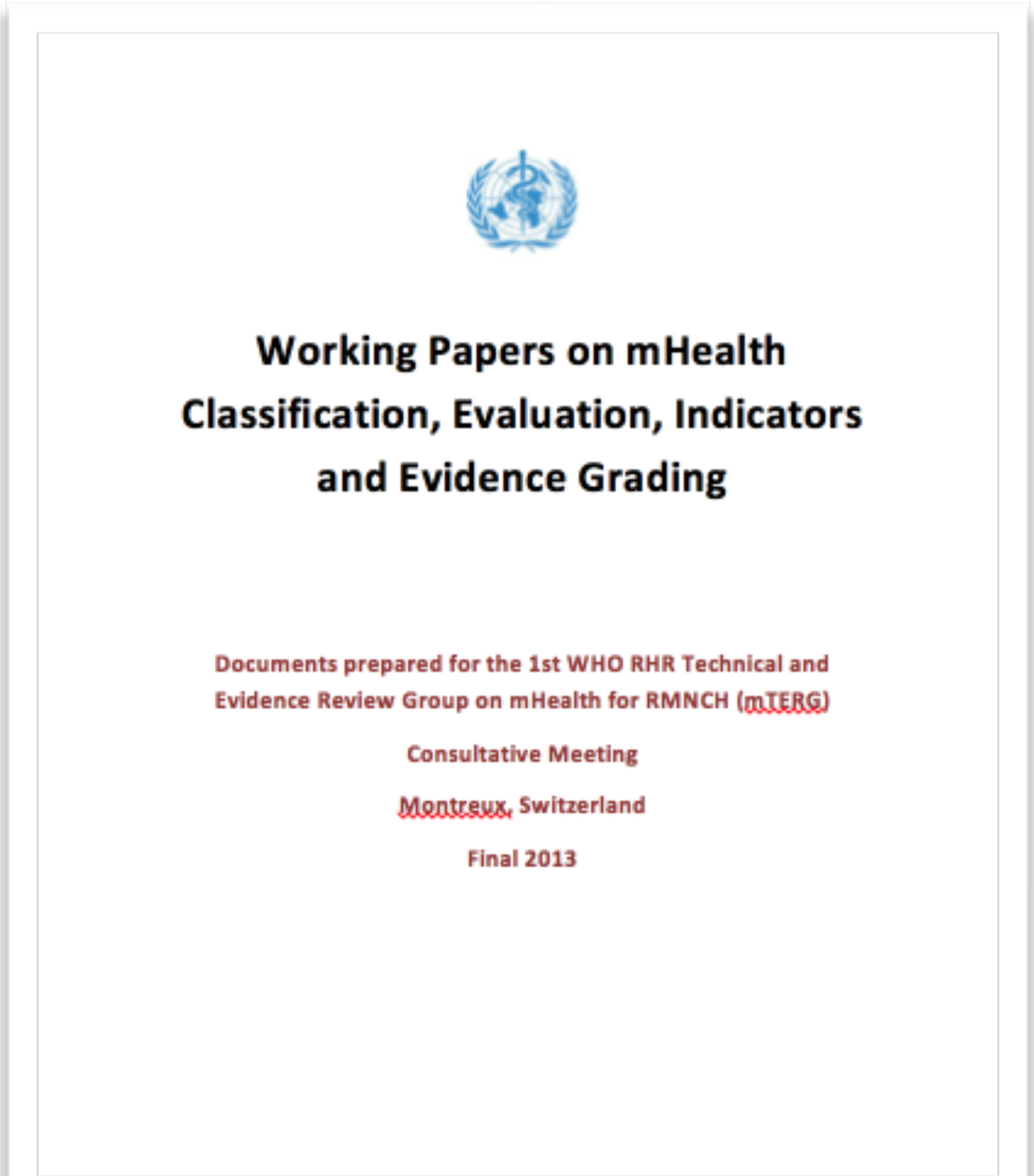
Bellagio Call to Action 2011

WHO mHealth Technical and Evidence Review Group

http://bit.ly/who-mterg

"Providing governments and implementing agencies objective, evidence-based guidance for the selection and scale of mHealth strategies across the reproductive, maternal, newborn and child health continuum"

WHO mTERG Methods



Working Papers on mHealth
Classification, Evaluation, Indicators and Evidence Grading

Documents prepared for the 1st WHO RHR Technical and Evidence Review Group on mHealth for RMNCH (mTERG)

Consultative Meeting

Montreux, Switzerland

Final 2013

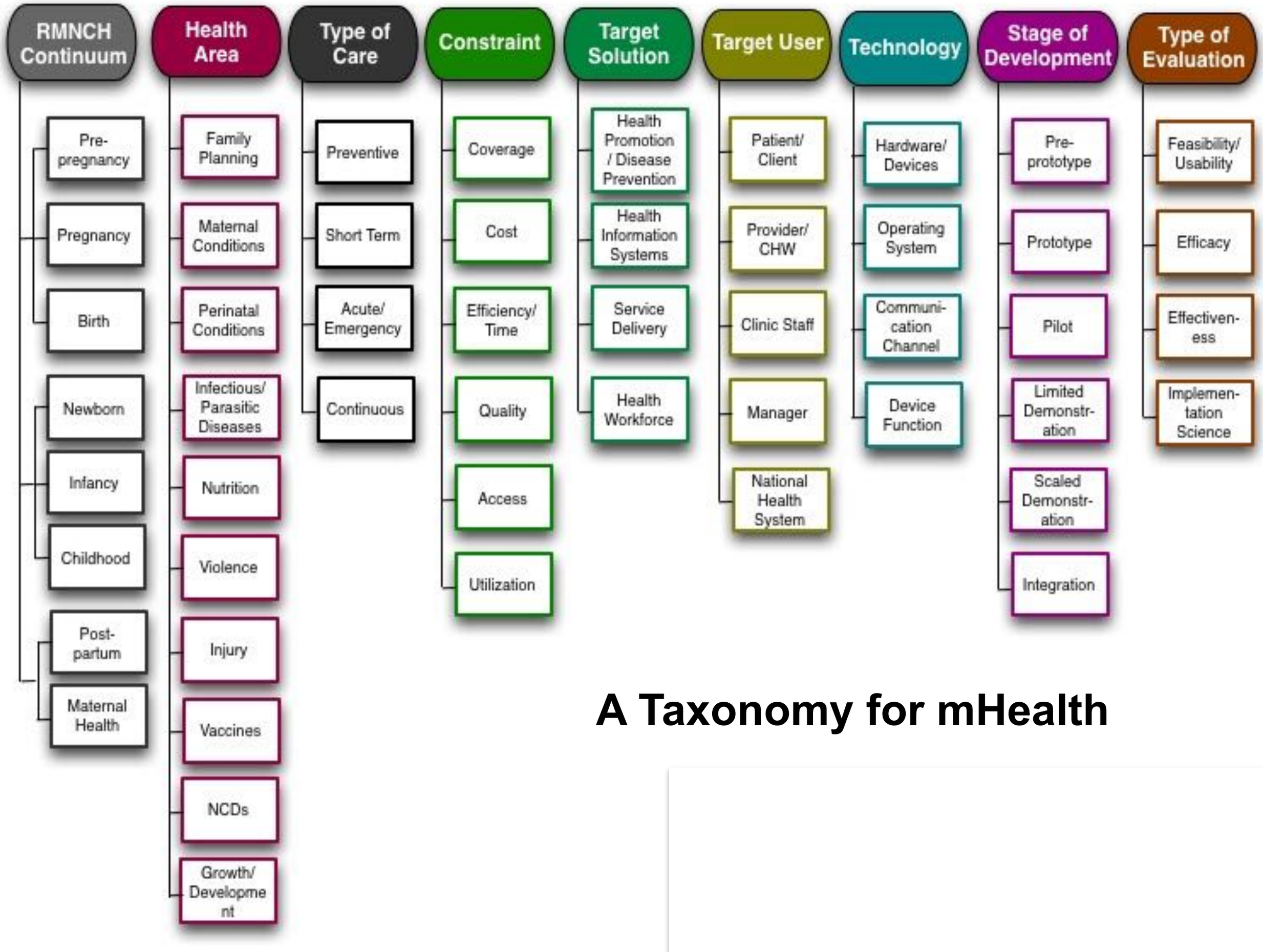
Standardized Language to Describe mHealth

Classification Taxonomy

Criteria for describing Implementation and Evidence Grading Methods

Standardized Indicators on mHealth Maturity

Garrett Mehl: mehlg@who.int



A Taxonomy for mHealth

HEALTH SYSTEM CHALLENGES

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INFORMATION

- 4.1.1 Lack of population denominator
- 4.1.2 Delayed reporting of events
- 4.1.3 Lack of quality/reliable data
- 4.1.4 Communication roadblocks
- 4.1.5 Lack of access to information or data
- 4.1.6 Insufficient utilization of data and information
- 4.1.7 Lack of unique identifier

AVAILABILITY

- 4.2.1 Insufficient supply of commodities
- 4.2.2 Insufficient supply of services
- 4.2.3 Insufficient supply of equipment
- 4.2.4 Insufficient supply of qualified health workers

QUALITY

- 4.3.1 Poor patient experience
- 4.3.2 Insufficient health worker competence
- 4.3.3 Low quality health commodities
- 4.3.4 Low Health worker motivation
- 4.3.5 Insufficient continuity of care
- 4.3.6 Inadequate supportive supervision
- 4.3.7 Poor adherence to guidelines

ACCEPTABILITY

- 4.4.1 Lack of alignment with local norms
- 4.4.2 Programs which do not address individual beliefs and practices

UTILIZATION

- 4.5.1 Low demand for services
- 4.5.2 Geographic inaccessibility
- 4.5.3 Low adherence to treatments
- 4.5.4 Loss to follow up

EFFICIENCY

- 4.6.1 Inadequate workflow management
- 4.6.2 Lack of or Inappropriate referrals
- 4.6.3 Poor planning and coordination
- 4.6.4 Delayed provision of care
- 4.6.5 Inadequate access to transportation

COST

- 4.7.1 High cost of manual processes
- 4.7.2 Lack of effective resource allocation
- 4.7.3 Client-side expenses
- 4.7.4 Lack of coordinated payer mechanism

Accountability

- 4.8.1 Lack of patient engagement
- 4.8.2 Unaware of service entitlement
- 4.8.3 Absence of community feedback mechanisms
- 4.8.4 Lack of transparency in commodity exchange
- 4.8.5 Poor accountability between the levels of the health sector
- 4.8.6 Low knowledge of the characteristics population to which you are responsible

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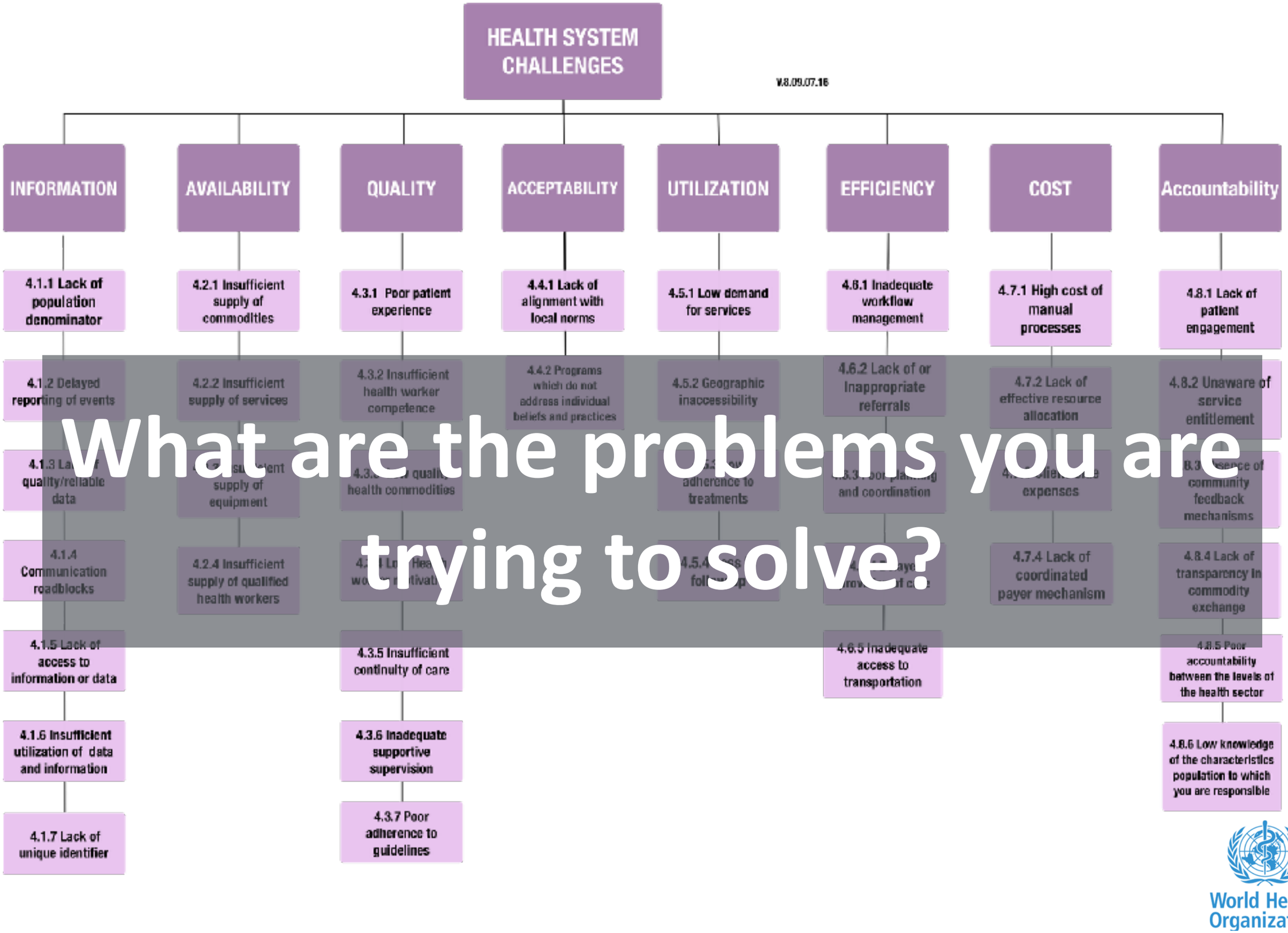

What are the problems you are trying to solve?

World Health Organization

mHealth strategies as catalysts for valid health interventions

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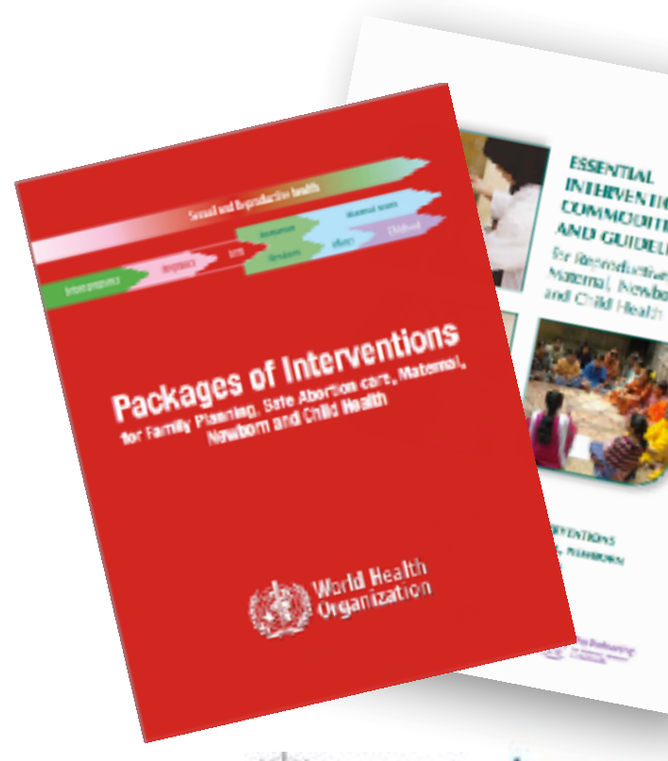
mHealth strategies as catalysts for valid health interventions

QUALITY & COVERAGE OF HEALTH INTERVENTION

INTERVENTION OF KNOWN EFFICACY



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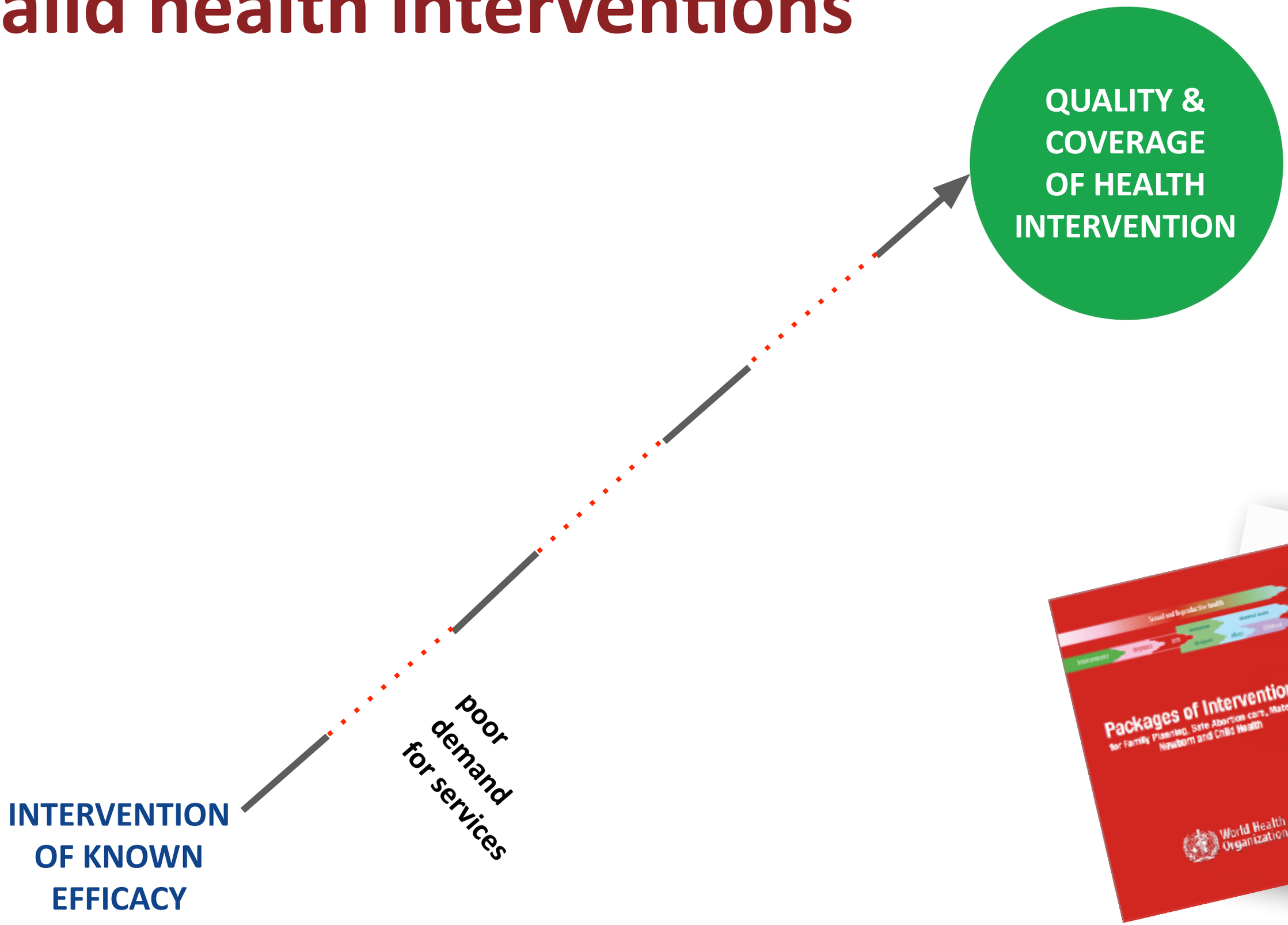

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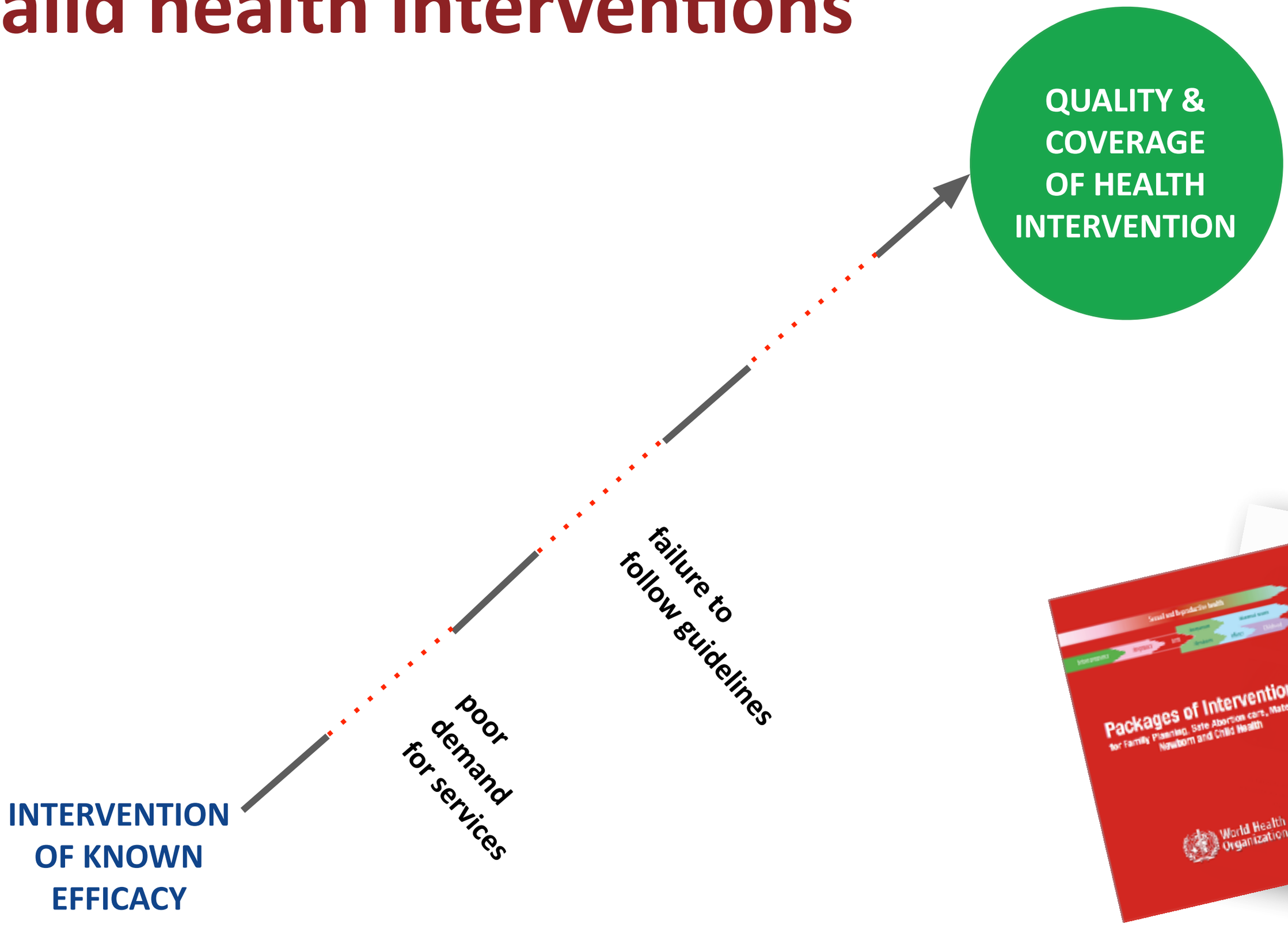

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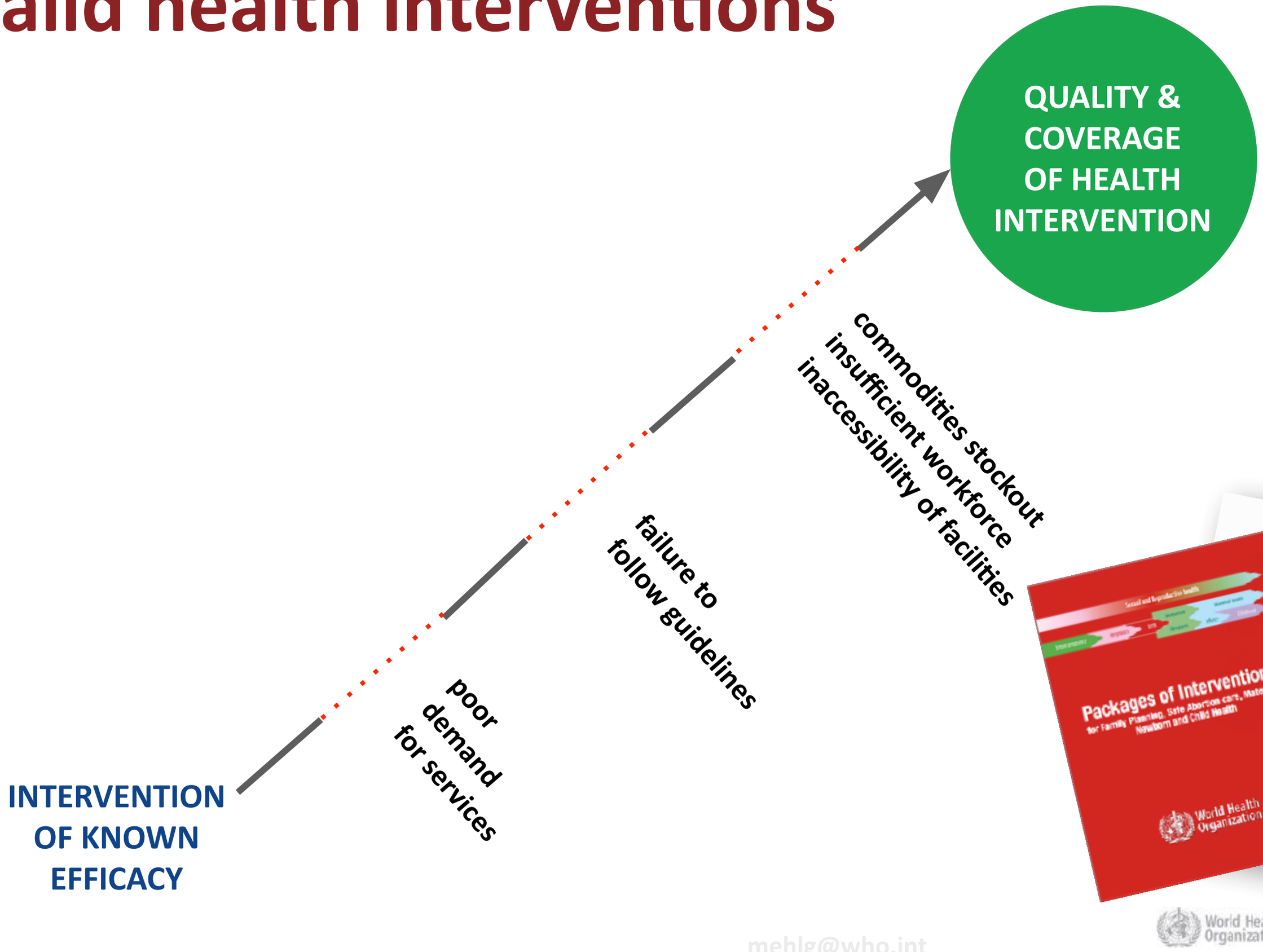

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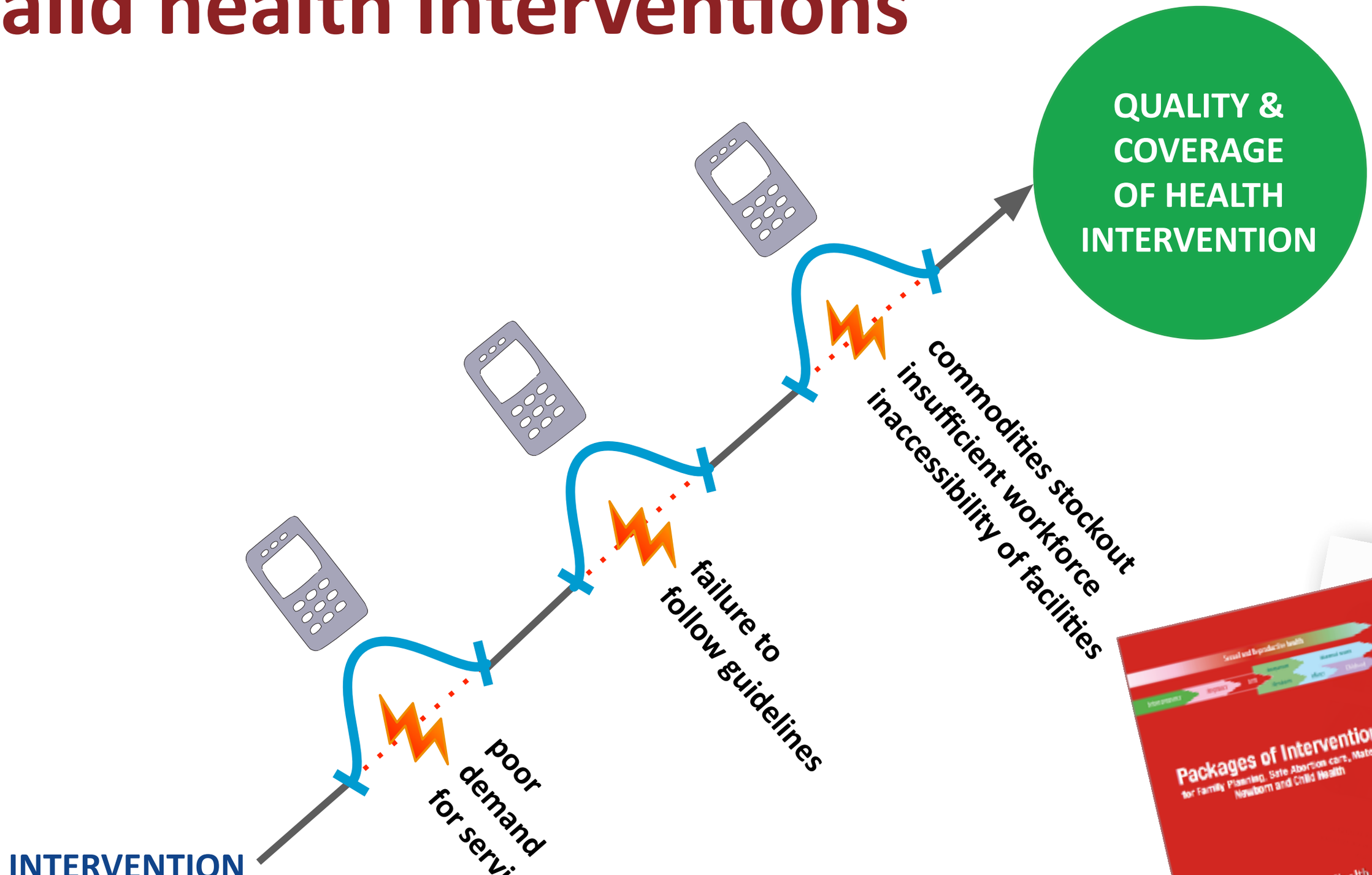

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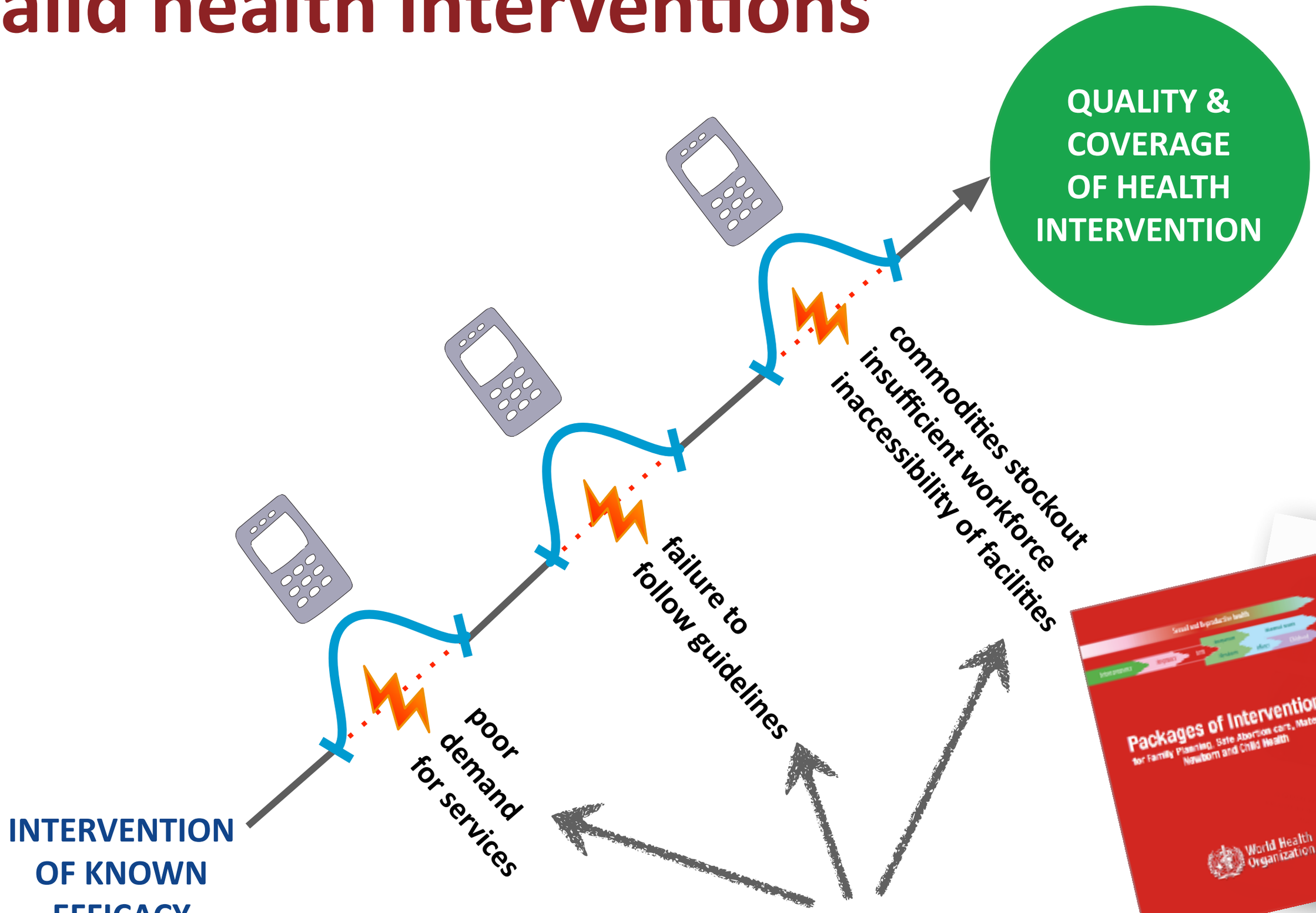

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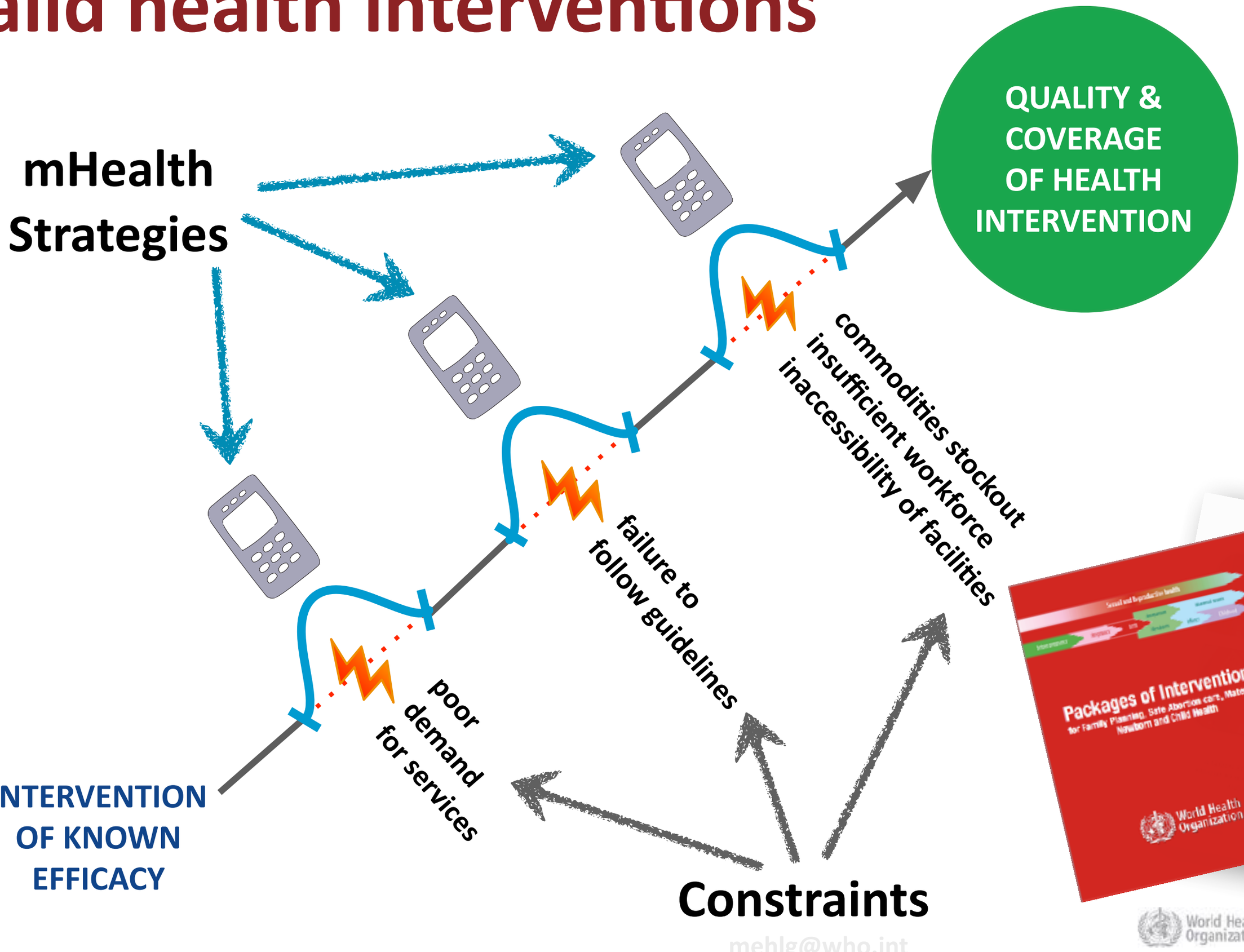

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mHealth Framework for Health Systems Strengthening

GLOBAL HEALTH: SCIENCE AND PRACTICE
Dedicated to what works in global health programs
OPEN ACCESS

TECHNICAL CONCEPT

mHealth innovations as health system strengthening tools: 12 common applications and a visual framework

Alain B Labrique,[a] Lavanya Vasudevan,[a] Erica Kochi,[b] Robert Fabricant,[c] Garrett Mehl[d]

This new framework lays out 12 common mHealth applications used as health systems strengthening innovations across the reproductive health continuum.

The rapid proliferation of mHealth projects—albeit mainly pilot efforts—has generated considerable enthusiasm among governments, donors, and implementers of health programs.[1] In many instances, these pilot projects have demonstrated conceptually how mHealth can alleviate specific health system constraints that hinder effective coverage of health interventions.

Large-scale implementation or integration of these mHealth innovations into health programs has been limited, however, by a shortage of empirical evidence supporting their value in terms of cost, performance, and health outcomes.[1–4] Governments in low- and middle-income countries face numerous challenges and competing priorities, impeding their ability to adopt innovations.[2] Thus, they need robust, credible evidence about mHealth projects in order to consider mHealth alongside essential health interventions, and guidance about which mHealth solutions they should consider to achieve broader health system goals.[2] Their tolerance for system instability or failure can be low, even when the status quo may be equally, or more, unreliable.

Current larger-scale effectiveness and implementation research initiatives are working to address the evidence gaps and to demonstrate the impact of mHealth investments on health system targets.[1] Other efforts are underway to synthesize such findings.[5]

MHEALTH AS A HEALTH SYSTEMS STRENGTHENING TOOL

Recent mHealth reviews have proposed that innovators focus on the public health principles underlying mHealth initiatives, rather than on specific mHealth technologies.[6] International agencies and research organizations have also endeavored to frame mHealth interventions within the broader context of health system goals or health outcomes.[2] The term "health system" includes all activities in which the primary purpose is to promote, restore, or maintain health.[7] Some elements of a framework for evaluating health systems performance by relating the goals of the health system to its essential functions have been proposed previously, which we believe can serve as a model for articulating and justifying mHealth initiatives and investments.[7]

Applying a health systems lens to the evaluation of mHealth initiatives requires different indicators and methodologies, shifting the assessment from whether the mHealth initiative "works" to process evaluation or proxy indicators of the health outcome(s) of interest. This new way of thinking would facilitate selection of mHealth tools that are appropriate for identified challenges. In other words, it would drive people to first identify the key obstacles, or constraints, to delivering proven health interventions effectively, and to then apply appropriate mHealth strategies that could overcome these health system constraints.[8]

Presenting mHealth as a range of tools for overcoming known health system constraints, as a health systems "catalyst," may also improve communication between mHealth innovators and health program implementers. Communicating mHealth technologies as tools that can enhance delivery of life-saving interventions through improvements in health systems performance, such as coverage, quality, equity, or efficiency, will resonate with health decision-makers.[7]

Hence, rather than being perceived as siloed, stand-alone solutions, mHealth strategies should be viewed as integrable systems that should fit into existing health system functions and complement the health

[a] Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA
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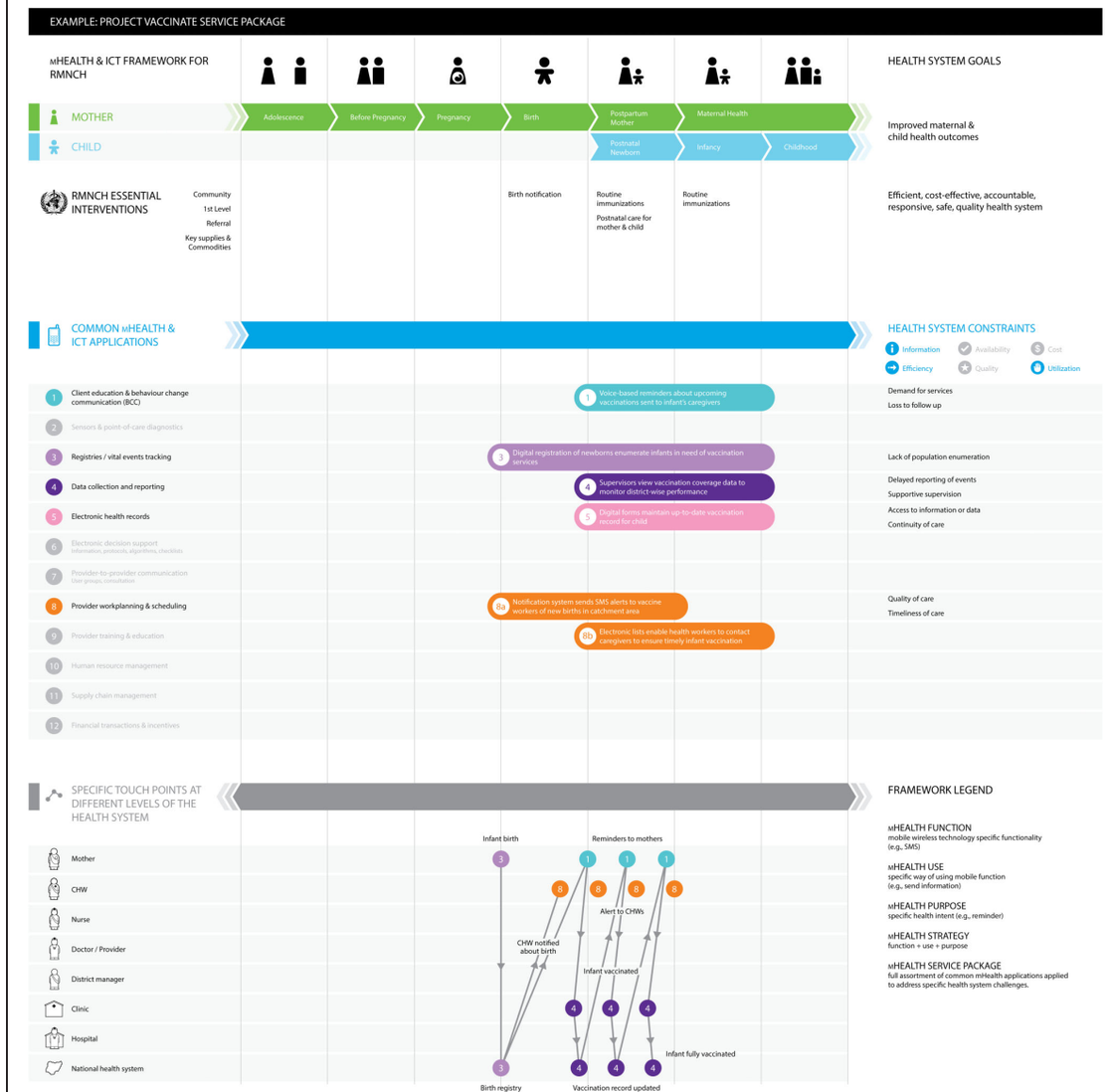
[c] frog Design, New York City, NY, USA
[d] World Health Organization, Geneva, Switzerland
Correspondence to Garrett Mehl (mehlg@who.int).

FIGURE 3. Sample Application of the mHealth and ICT Framework for RMNCH



Abbreviations: CHW, community health worker; ICT, information and communications technology; RMNCH, reproductive, maternal, newborn, and child health.

The fictional "Project Vaccinate" is an mHealth system that integrates 6 of the 12 common mHealth applications to identify newborns and support families and community health workers in ensuring timely and complete vaccination.

mHealth Framework for Health Systems Strengthening

FIGURE 3. Sample Application of the mHealth and ICT Framework for RMNCH

FIGURE 2. Twelve Common mHealth and ICT Applications

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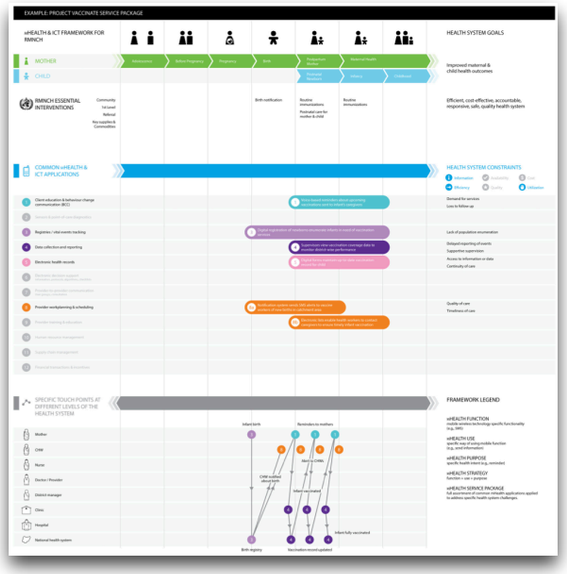
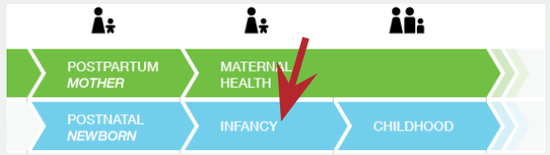
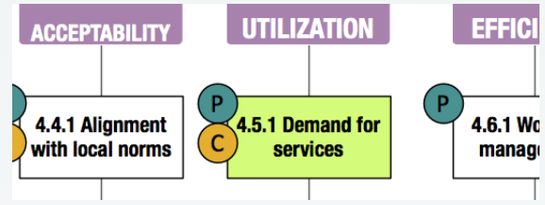
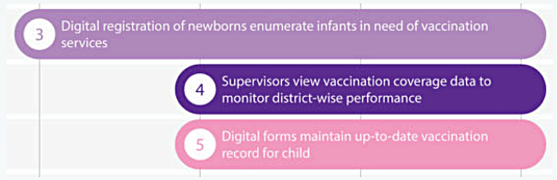
mHealth Framework for Health Systems Strengthening Components

WHO mHealth and ICT framework for RMNCH



Questions	Illustrative Options	Example	Visual on Framework
When is mHealth applied along the life course?	Adolescence Pregnancy Birth Childhood	During infancy	
What Health Interventions are being enhanced?	Malaria treatment PMTCT, breastfeeding, micronutrient supplementation, tobacco cessation	Postpartum care	
Which health constraint(s) are being overcome?	Geographic inaccessibility, poor demand for services, client-side expenses	Low Demand for Services	
How is mHealth applied (technology function, use, purpose)?	Client education and behavior change, sensors and point of care diagnostics	SMS reminder messages about upcoming vaccinations	
Where does mHealth implementation engage actors (facilities, providers, clients)?	Home, PHC, district facility, client, provider, laboratory, national health information system	SMS reminder message about upcoming appointment is sent to client's phone	

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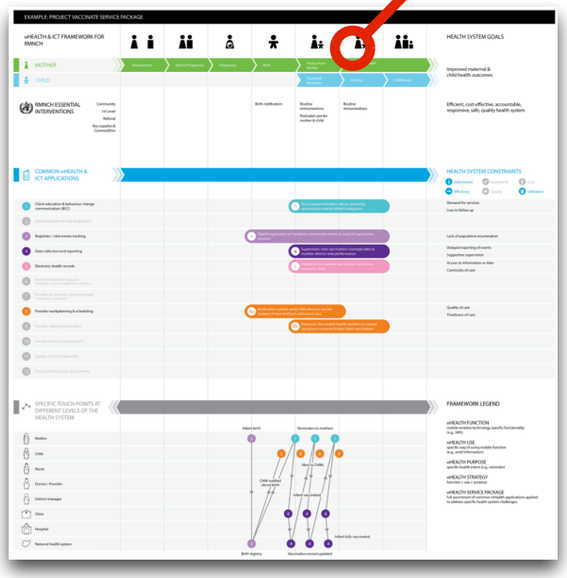

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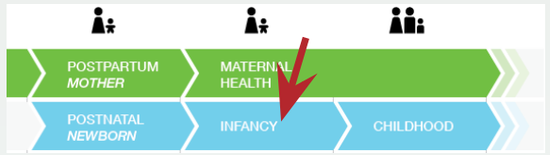
When is mHealth applied along the life course?	Adolescence Pregnancy Birth Childhood	During infancy	
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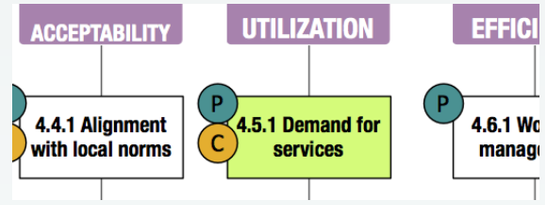
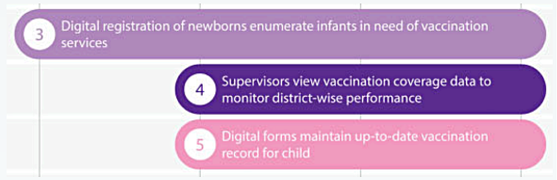
Which health constraint(s) are being overcome?	Geographic inaccessibility, poor demand for services, client-side expenses	Low Demand for Services	
How is mHealth applied (technology function, use, purpose)?	Client education and behavior change, sensors and point of care diagnostics	SMS reminder messages about upcoming vaccinations	
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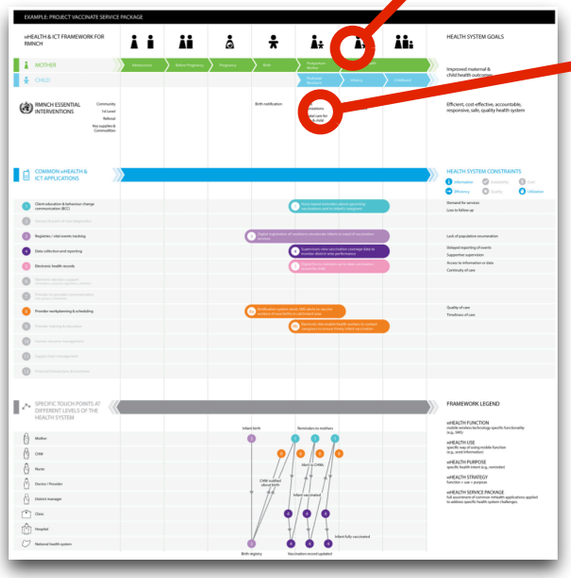

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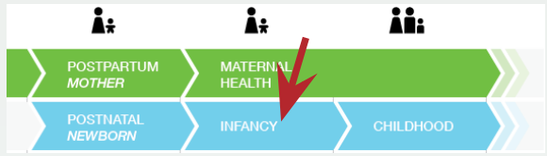
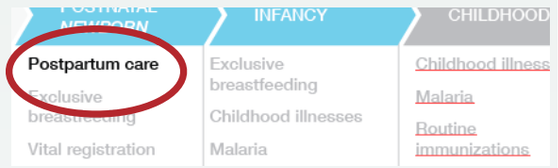
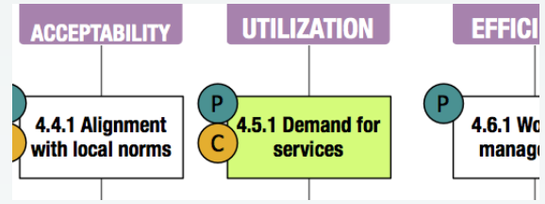
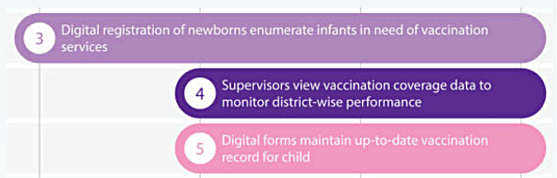
When is mHealth applied along the life course?	Adolescence Pregnancy Birth Childhood	During infancy	
What Health Interventions are being enhanced?	Malaria treatment PMTCT, breastfeeding, micronutrient supplementation, tobacco cessation	Postpartum care	
Which health constraint(s) are being overcome?	Geographic inaccessibility, poor demand for services, client-side expenses	Low Demand for Services	
How is mHealth applied (technology function, use, purpose)?	Client education and behavior change, sensors and point of care diagnostics	SMS reminder messages about upcoming vaccinations	
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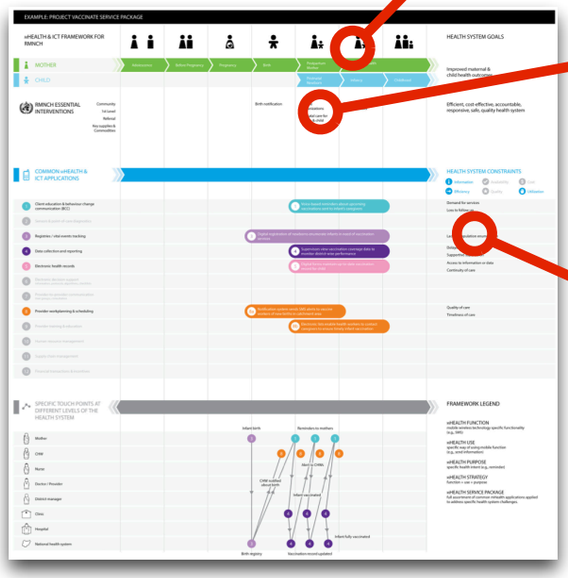

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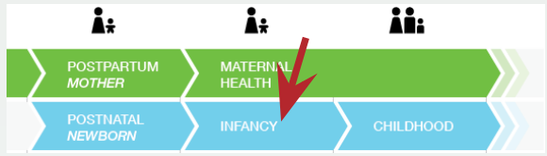
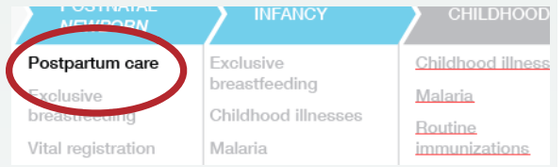
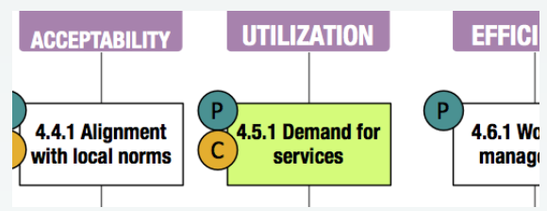
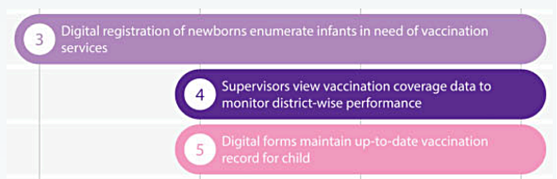
When is mHealth applied along the life course?	Adolescence Pregnancy Birth Childhood	During infancy	
What Health Interventions are being enhanced?	Malaria treatment PMTCT, breastfeeding, micronutrient supplementation, tobacco cessation	Postpartum care	
Which health constraint(s) are being overcome?	Geographic inaccessibility, poor demand for services, client-side expenses	Low Demand for Services	
How is mHealth applied (technology function, use, purpose)?	Client education and behavior change, sensors and point of care diagnostics	SMS reminder messages about upcoming vaccinations	
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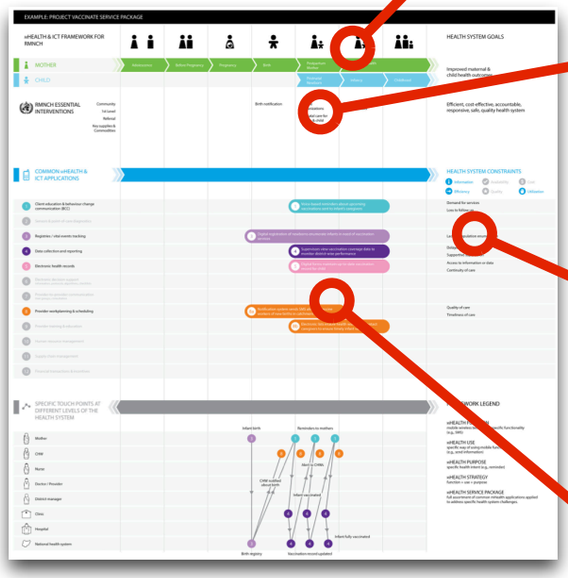

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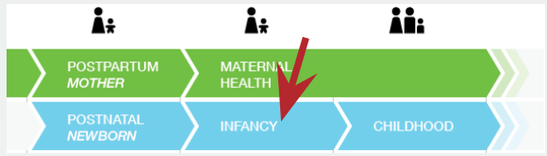
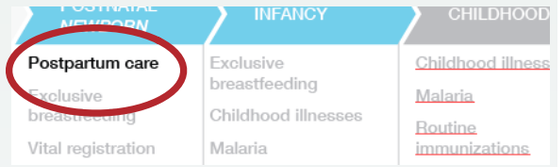
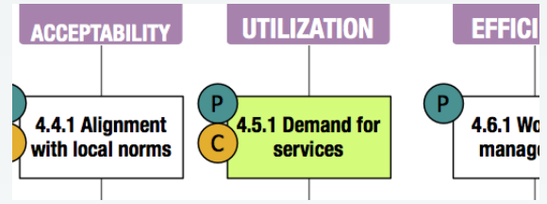
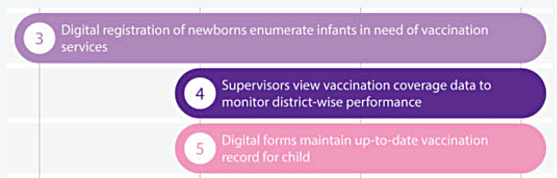
When is mHealth applied along the life course?	Adolescence Pregnancy Birth Childhood	During infancy	
What Health Interventions are being enhanced?	Malaria treatment PMTCT, breastfeeding, micronutrient supplementation, tobacco cessation	Postpartum care	
Which health constraint(s) are being overcome?	Geographic inaccessibility, poor demand for services, client-side expenses	Low Demand for Services	
How is mHealth applied (technology function, use, purpose)?	Client education and behavior change, sensors and point of care diagnostics	SMS reminder messages about upcoming vaccinations	
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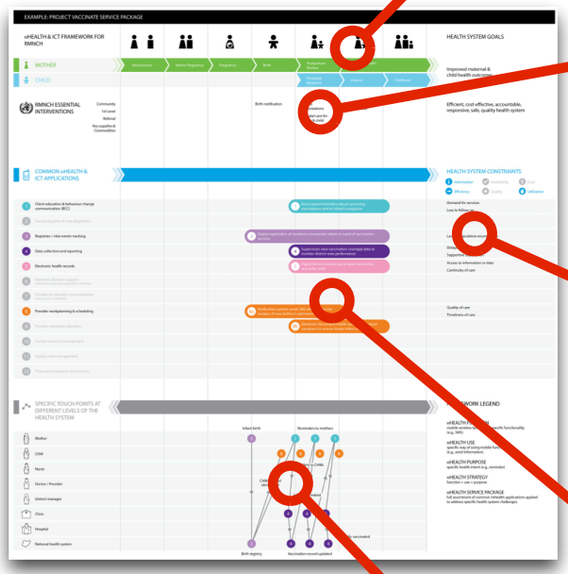
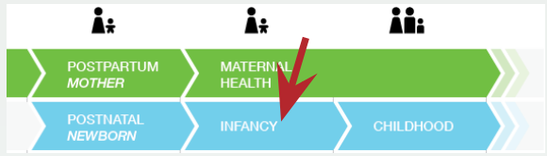
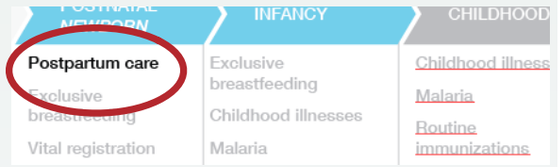
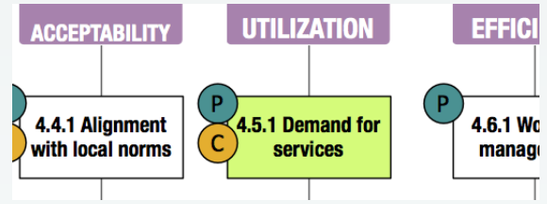
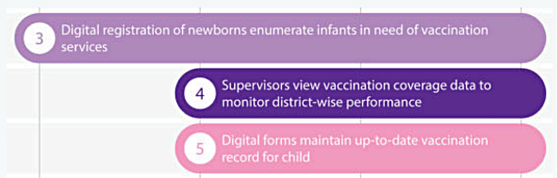
mHealth Framework for Health Systems Strengthening Components

WHO mHealth and ICT framework for RMNCH



Questions	Illustrative Options	Example	Visual on Framework
When is mHealth applied along the life course?	Adolescence Pregnancy Birth Childhood	During infancy	
What Health Interventions are being enhanced?	Malaria treatment PMTCT, breastfeeding, micronutrient supplementation, tobacco cessation	Postpartum care	
Which health constraint(s) are being overcome?	Geographic inaccessibility, poor demand for services, client-side expenses	Low Demand for Services	
How is mHealth applied (technology function, use, purpose)?	Client education and behavior change, sensors and point of care diagnostics	SMS reminder messages about upcoming vaccinations	
Where does mHealth implementation engage actors (facilities, providers, clients)?	Home, PHC, district facility, client, provider, laboratory, national health information system	SMS reminder message about upcoming appointment is sent to client's phone	

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mHealth Evidence
by K4Health

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What is mHealth Evidence?

mHealth is the use of mobile information and communication technologies for improving health. It can be used for a wide range of purposes, including health promotion and illness prevention, health care delivery, training and supervision, electronic payments, and information systems. Many believe that it has the potential to shift the paradigm on when, where, how and by whom health services are provided and accessed.

But mHealth is a young field and much of the evidence on "what works" is still emerging. Even the evidence that exists can sometimes be difficult to find.

BROWSE MHEALTH EVIDENCE TOPICS

- Beneficiary Age Range
- Care Model
- Health Domain
- Health System Constraint
- Location
- mHealth Application
- Special Population
- Stage of Development
- Stage of Evaluation
- Target User
- Technology

VIEW MOST RECENT RECORDS

- Temporal motifs reveal homophily, gender-specific patterns, and group talk in call sequences.
- Tobacco smoking surveillance: is quota sampling an efficient tool for monitoring national trends? A comparison with a random cross-sectional survey.
- Mobile Phone-based Syndromic Surveillance System, Papua New Guinea.
- Design and Test of a Hybrid Foot Force Sensing and GPS System for Richer User Mobility Activity Recognition.
- Mobile phone tracking: In support of modelling traffic-

mHealthEvidence.org

Guidelines for reporting of health interventions using mobile phones: mobile health (mHealth) evidence reporting and assessment (mERA) checklist

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To improve the completeness of reporting of mobile health (mHealth) interventions, the WHO mHealth Technical Evidence Review Group developed the mHealth evidence reporting and assessment (mERA) checklist. The development process for mERA consisted of convening an expert group to recommend an appropriate approach, convening a global expert review panel for checklist development, and pilot testing the checklist. The guiding principle for the development of these criteria was to identify a minimum set of information needed to define what the mHealth intervention is (content), where it is being implemented (context), and how it was implemented (technical features), to support replication of the intervention. This paper presents the resulting 16 item checklist and a detailed explanation and elaboration for each item, with illustrative reporting examples. Through widespread adoption, we expect that the use of these guidelines will standardise the quality of mHealth evidence reporting, and indirectly improve the quality of mHealth evidence.

SUMMARY POINTS

To improve the reporting of mobile health (mHealth) interventions, the WHO mHealth Technical Evidence Review Group developed a checklist on mHealth evidence reporting and assessment (mERA)

The checklist aims to identify a minimum set of information needed to define what the mHealth intervention is (content), where it is being implemented (context), and how it was implemented (technical features), to support replication of the intervention

Through widespread adoption, these guidelines should standardise the quality of mHealth evidence reporting, and indirectly improve the quality of mHealth evidence

Mobile technologies have the potential to bridge systemic gaps needed to improve access to and use of health services, particularly among underserved populations. mHealth—defined as the use of mobile and wireless technologies for health—aims to capitalise on the rapid uptake of information and communication technologies (ICT) to improve health system efficiency and health outcomes. Over the past decade, global enthusiasm and the interest of development agencies, researchers, and policy makers have led to the rapid proliferation of mHealth solutions throughout developed and developing countries. The World Bank reported that there were more than 500 mHealth projects in 2011 alone.[1] Despite the emergence of hundreds of mHealth studies and initiatives, there remains a lack of rigorous, high quality evidence on the efficacy and effectiveness of such interventions.[2 3] The current mHealth evidence is disseminated in multiple forms including peer reviewed literature, white papers, reports, presentations, and blogs. The evidence base is heterogenous in quality, completeness, and objectivity of the reporting of mHealth interventions—thus making comparisons across intervention strategies difficult. This has led to a call for a set of standards that can harmonise and improve the quality of future research publications, to facilitate screening of emerging evidence and identification of critical evidence gaps. Such improvements in reporting of evidence can support policy makers in making decisions around mHealth intervention selection.[4]

The value of standardised guidelines is well accepted and several tools exist to assess the quality and to standardise the reporting of scientific evidence. For example, the grading of recommendations assessment, development, and evaluation (GRADE) approach rates the quality of evidence and the strength of recommendations, and is routinely used by international organisations such as the World Health Organization and Cochrane Collaboration.[5] In other fields, the consolidated health economic evaluation reporting standards (CHEERS) statement provides reporting guidance for economic evaluations.[6] Other tools have also been developed to standardise the reporting of systematic reviews and meta-analyses (eg, preferred reporting of systematic reviews and meta-analyses (PRISMA)),[7] and assess their methodological quality or reliability (eg, assessing methodological quality of systematic reviews (AMSTAR)).[8] The consolidated standards for reporting trials (CONSORT) statement provides a 22 item checklist for reporting of randomised controlled trials.[9] Other evidence reporting and synthesis approaches exist for

mERA:

mHealth Evaluation, Reporting and Assessment Guidelines

mERA:

mHealth Evaluation, Reporting and Assessment Guidelines

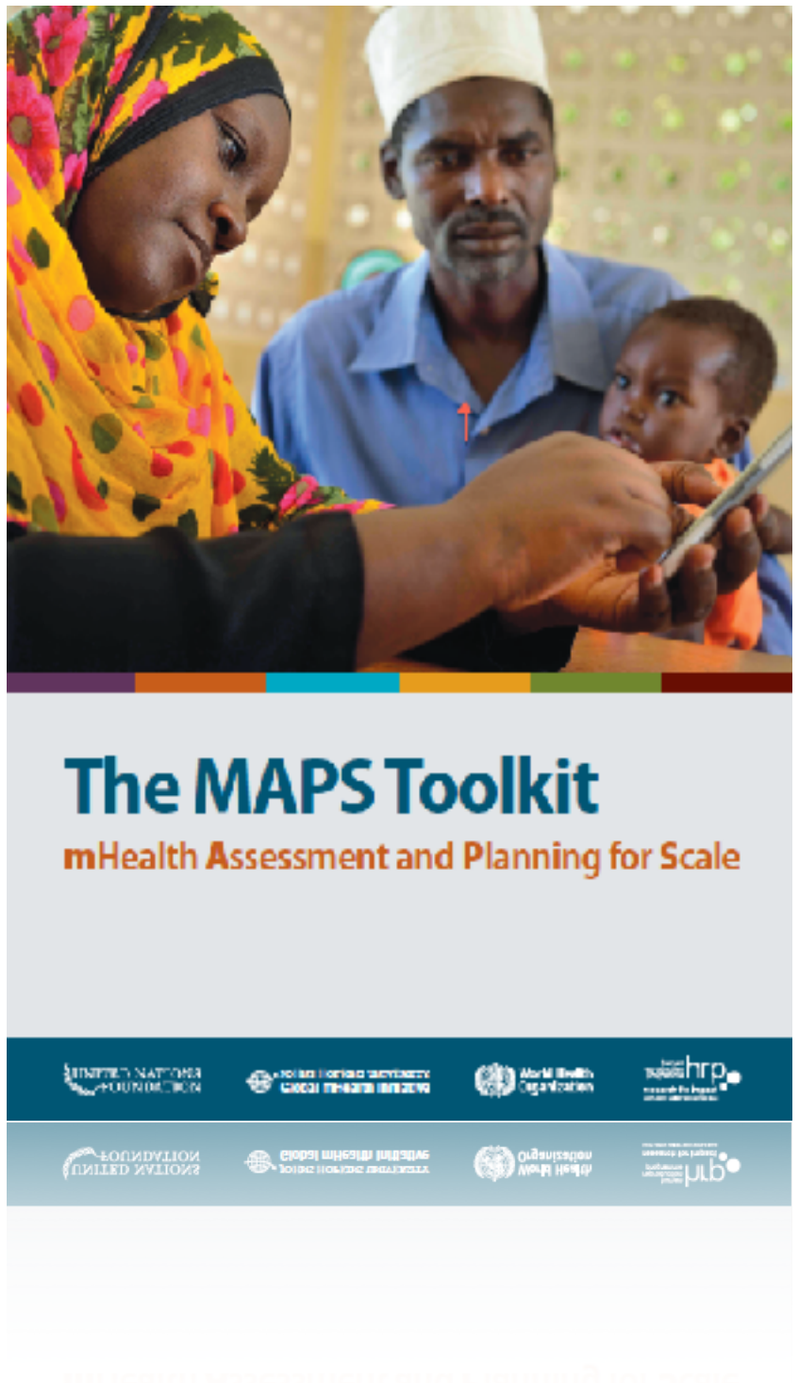
WHO mTERG complement to PRISMA / CONSORT

A pragmatic approach that promotes high-quality reporting of mHealth innovation research, across varied study designs to facilitate evidence synthesis and development of guidance

- **Domain 1: Research Methodology Reporting**
- **Domain 2: Essential mHealth (Technology, Functionality, Delivery) Reporting**

Domain	Description	No.
Domain 1.1	General Reporting and Methodology Criteria	23
Domain 1.2	Quantitative Criteria	4
Domain 1.3	Qualitative Criteria	3
Domain 2	mHealth Criteria	14

mHealth Assessment and Planning for Scale (MAPS) toolkit for Maturity Assessment

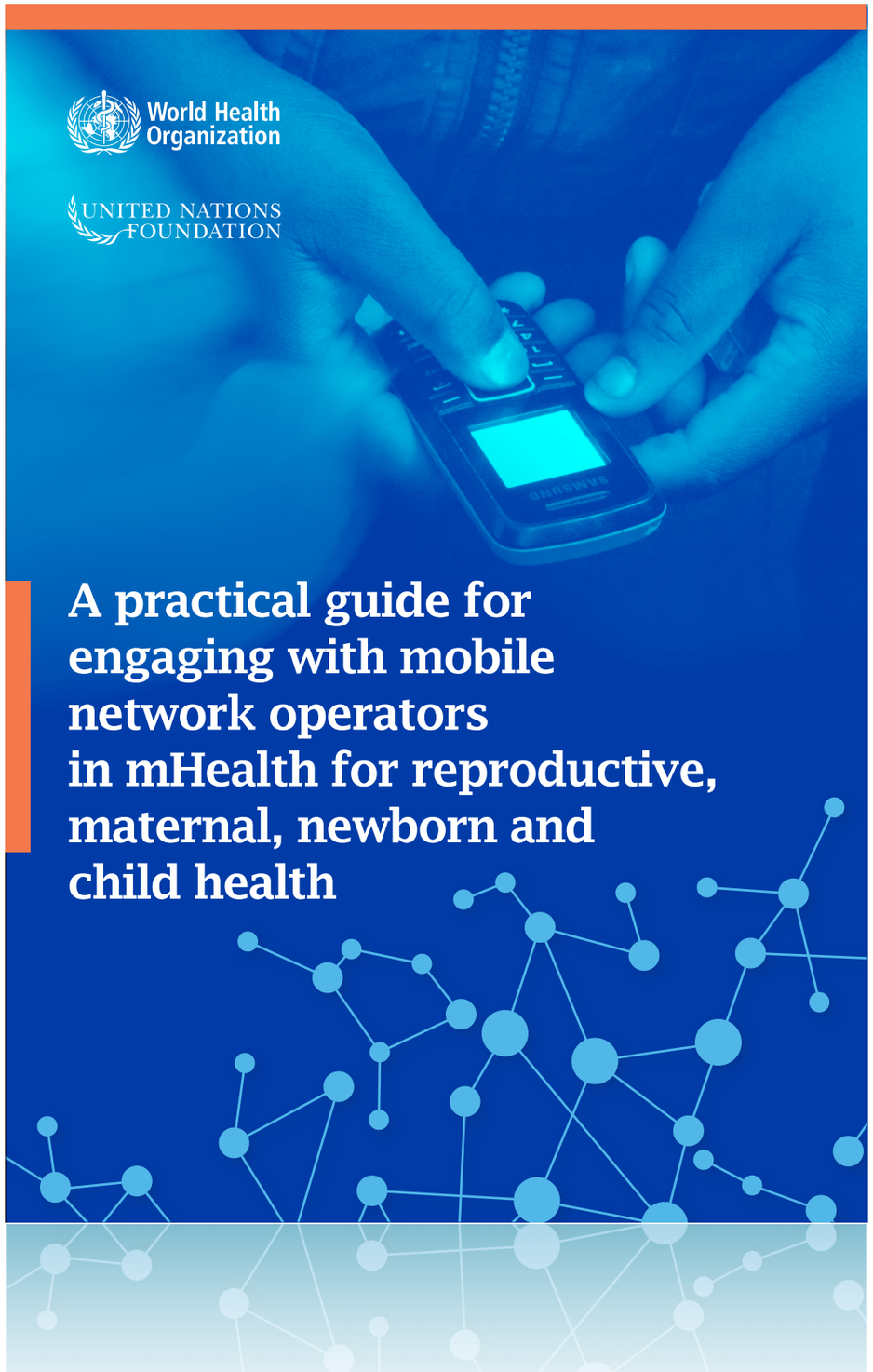


- MAPS provides **actionable information** to improve mHealth projects' capacity to scale up

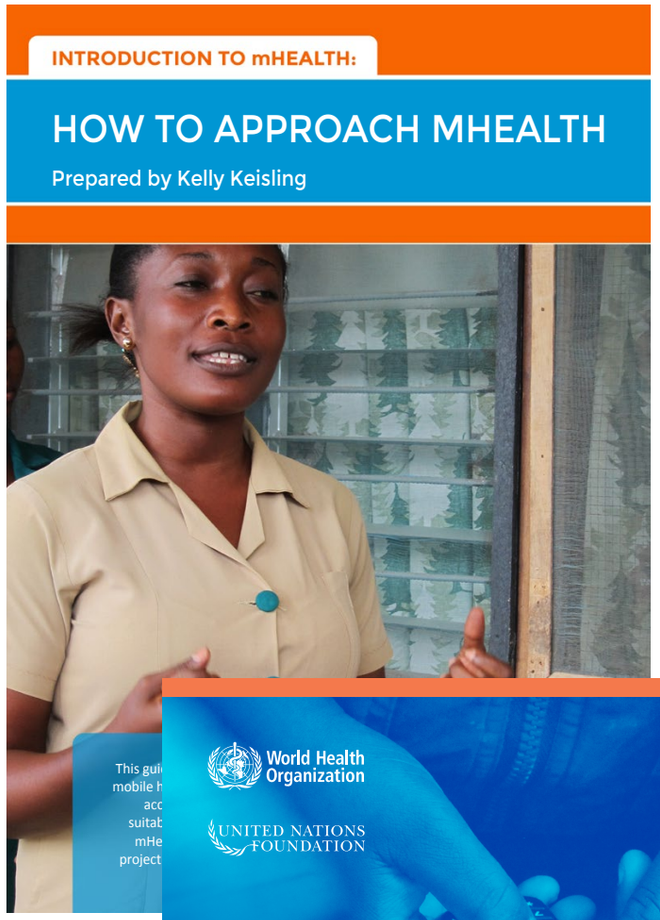
- Informed by WHO, UN IWG Catalytic Grant Mechanism for mHealth projects

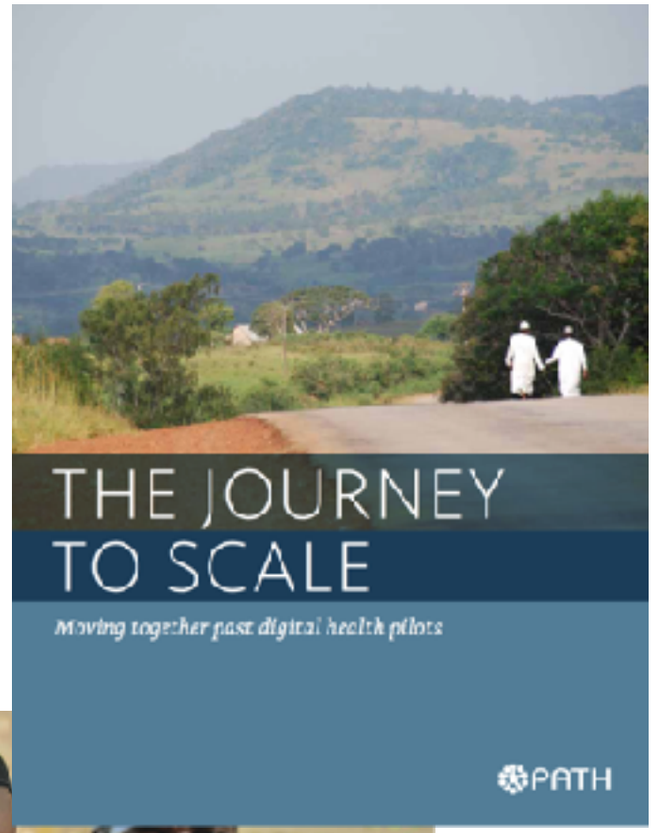
- MAPS has **two main goals**:
  1. Assess Maturity
  2. Plan

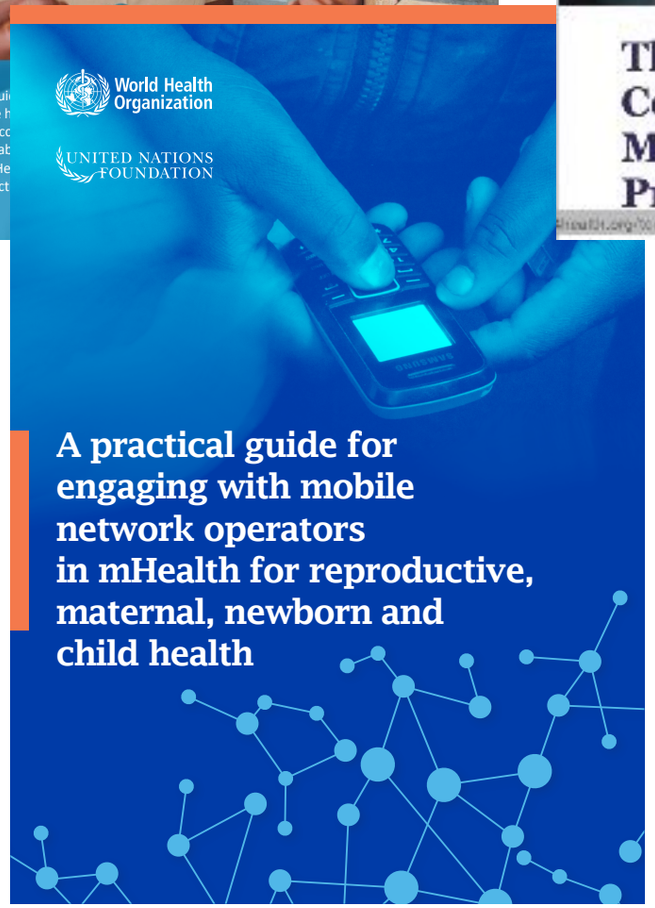
Practical Engagement with mobile network operators (MNOs)

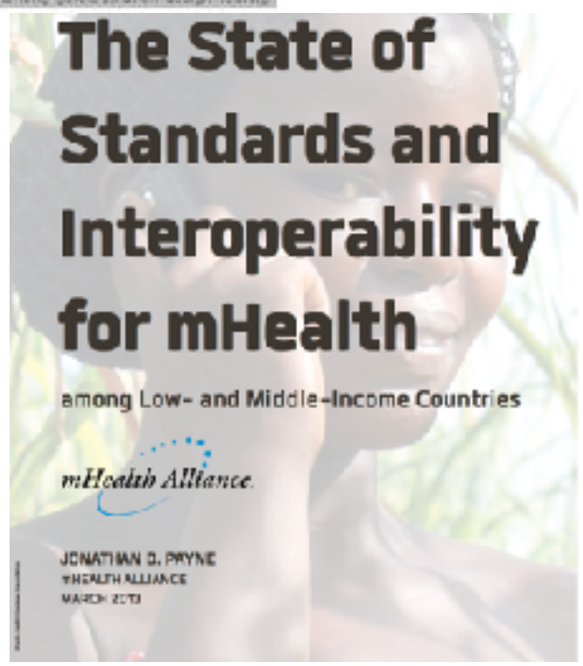


Project/Product Toolkits









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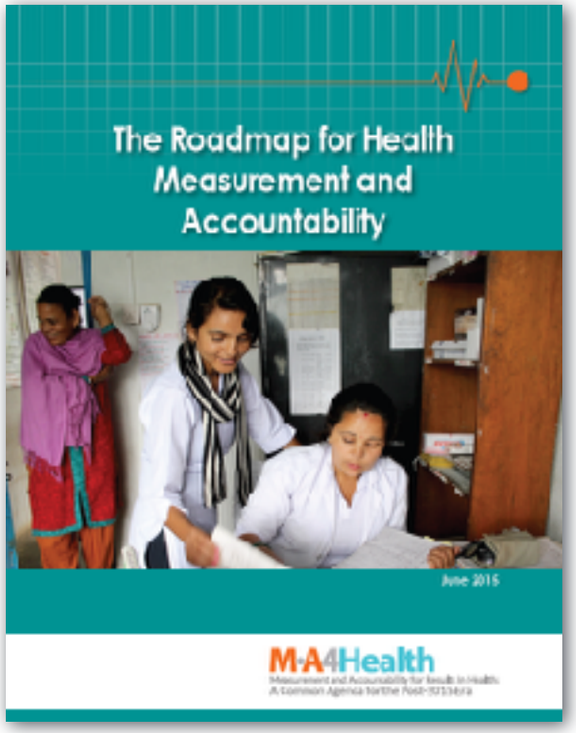
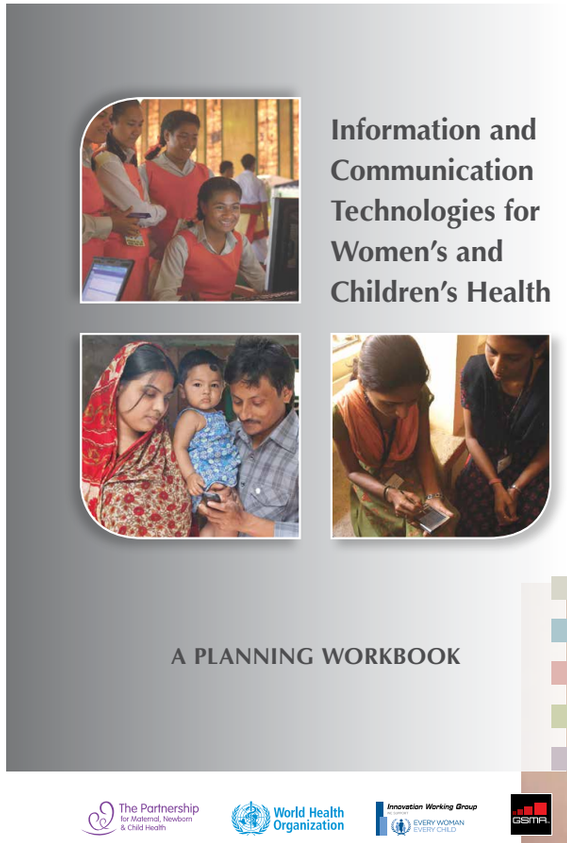
Government Toolkits





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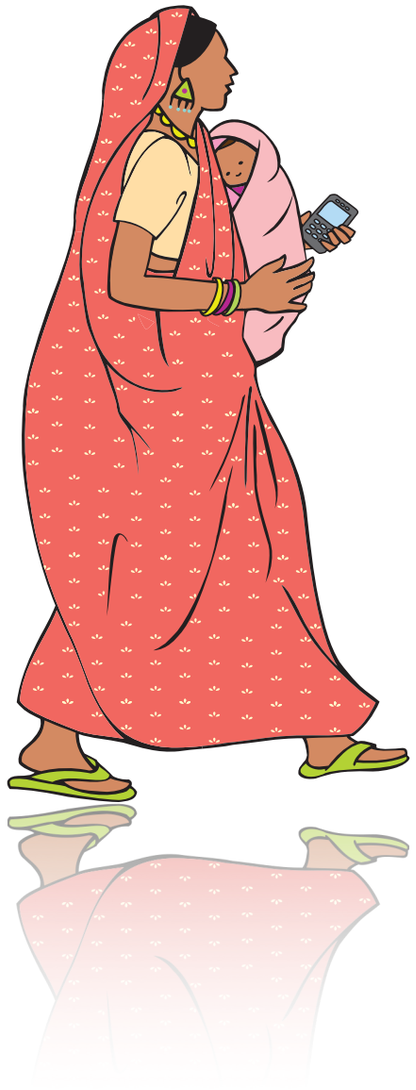
Under new mechanisms like Health Data Collaborative entering new era for Digital Health with UN SDGs, where Global Goods become critical to success

With Strong Partners WHO is now focused on:

- Taxonomy revision
- Digital Health Atlas
- Toolkit on M&E
- WHO Recommendations on Digital Health
- Government Implementation Guide



Thank you

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