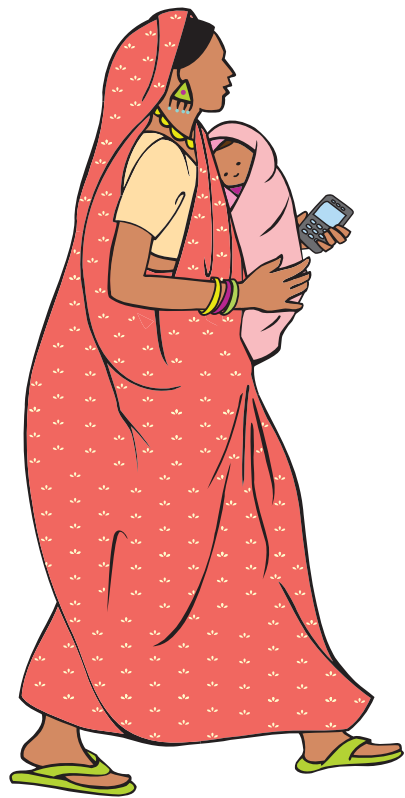


Towards an understanding of mHealth effects on reproductive health, and determining ways to synthesize the scientific evidence



Dr. Garrett Mehl
**Department of Reproductive Health
and Research**
World Health Organization



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Innovations **CATALYST**
Innovate • Evaluate • Scale up • Improve health



Government Choices

- Low government spending on health in low-income countries (>50% african countries = <\$14/capita)
- Considerable out-of-pocket-expenditure = financial risk for families
- Government decisions (and recommendations) on investments in new areas **must be evidence-based** to **maximize health impact** of limited resources and **minimize risk**

Health Community and Decision-makers in Government

- In RMNCH, ICTs and mobile devices can be used to empower both clients and health workers to **improve effectiveness of reproductive, maternal, newborn & child health (RMNCH) interventions**
- Governments are **demanding evidence** that ICT and mobile-enhanced strategies can improve the coverage and quality of **existing health interventions**.
- There is a growing body of evidence supporting strategies that can improve health systems and outcomes, **which needs to be better disseminated**.

Public Health Interventions of known efficacy exist and are well described

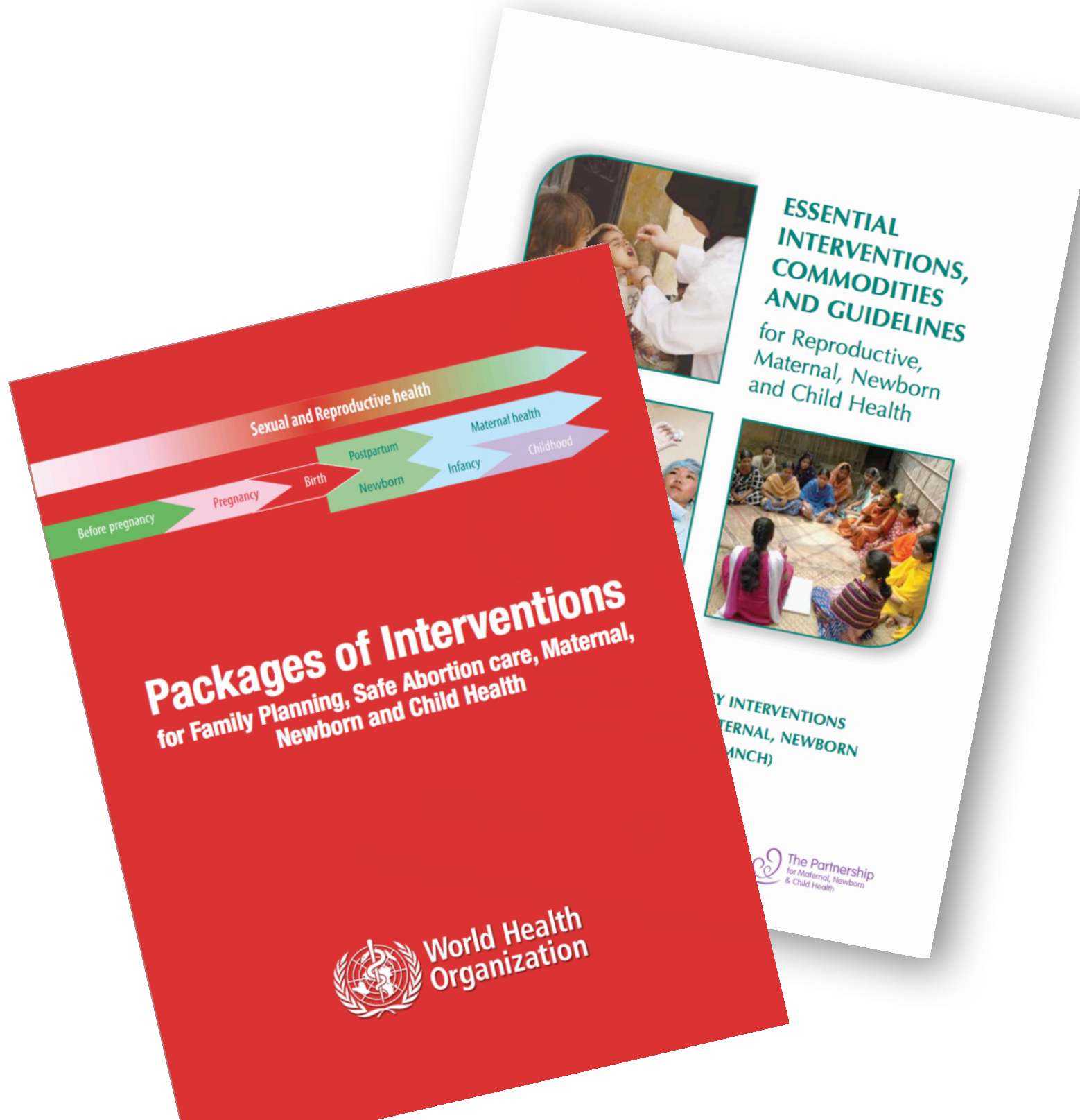
COMMUNITY LEVEL/HOME



FIRST LEVEL/OUTREACH



REFERRAL LEVEL/DISTRICT HOSPITAL



WHO Stakeholder Request

Which mHealth strategies should be invested in to ensure that these already **validated interventions** are **accessible** and **effective** for everyone?



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WHO RHR Specific objectives

- Determine evidence-informed **packages of mHealth strategies** consisting of specific functions with specific purpose across the RMNCH continuum that can be recommended for widespread adoption.



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mHealth Language

mHealth Platform	technology(ies) (operating system + code + functions)	Dimagi's Commcare
mHealth Project	mHealth platform + geo + strategies used	m4RH in Madagascar
mHealth Strategy	function, use, purpose (to address constraints)	Interactive text message to improve information FP method choice

mHealth Causal Chain



Function	Use	Purpose	Health Constraint
Text Message	Info Delivery	Reminder	non-compliance to drug regimen

Question: does providing an SMS message as reminder to take drug (e.g., iron supplementation) lead to increased use?

Priority for scientific review

- mHealth Project
- mHealth Technology Platform
- mHealth Strategy

mHealth Strategy

- To understand the value of mHealth, and to understand how to research the effect, and to synthesize the evidence, we have to examine specific **mHealth strategies**
- **mHealth strategy** = function + use + purpose (to address specific constraint(s))

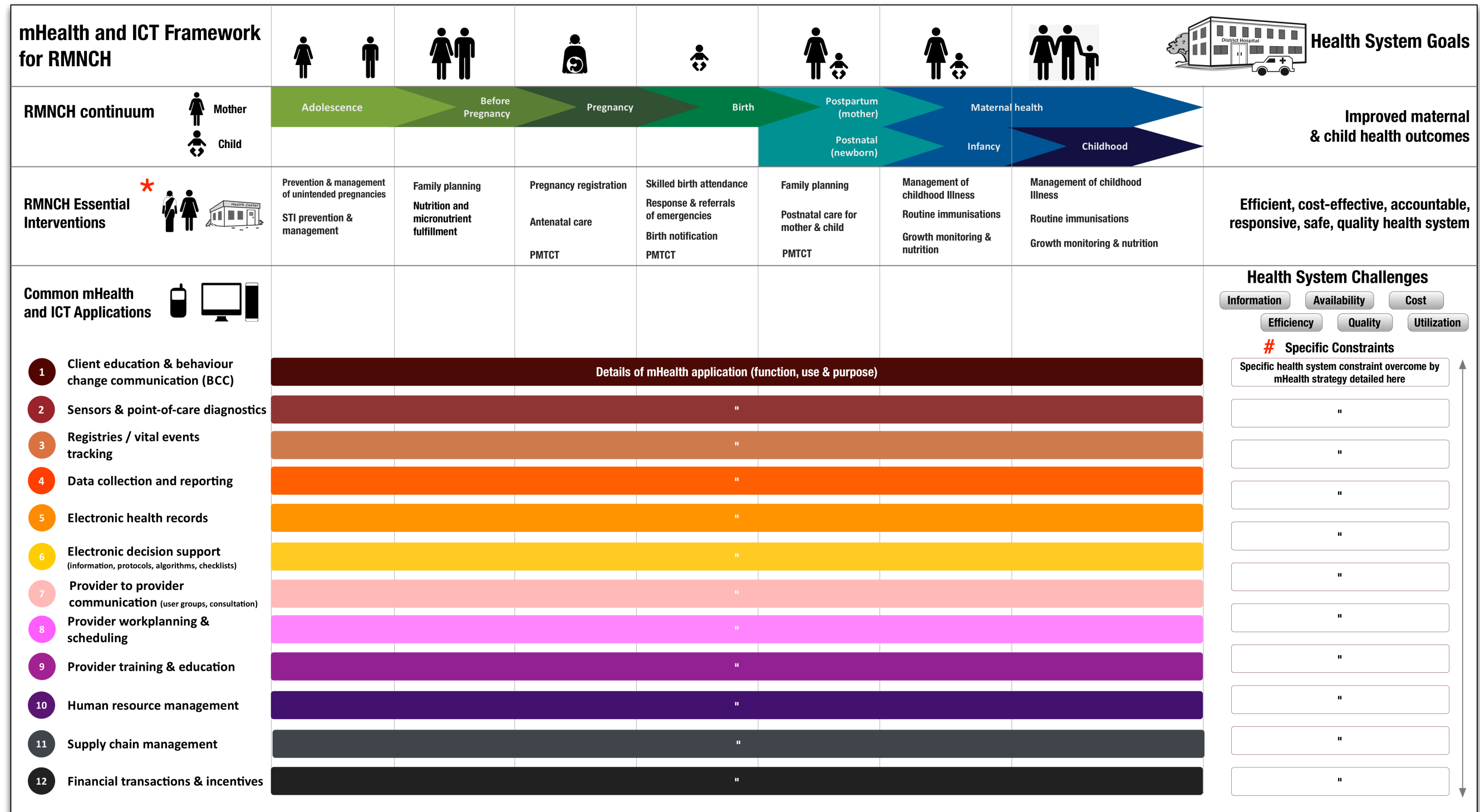
Decision-makers Questions

- Do *mHealth Strategies* lead to improvement in **effective coverage** of RMNCH essential interventions?
- Specifically:
 - Does mHealth lead to an improvement in **coverage** of interventions of known efficacy, and
 - Improvement in **effectiveness**: quality, efficiency/timeliness, cost, utilization

mHealth and ICT Framework for RMNCH

Project title or mHealth service package title here

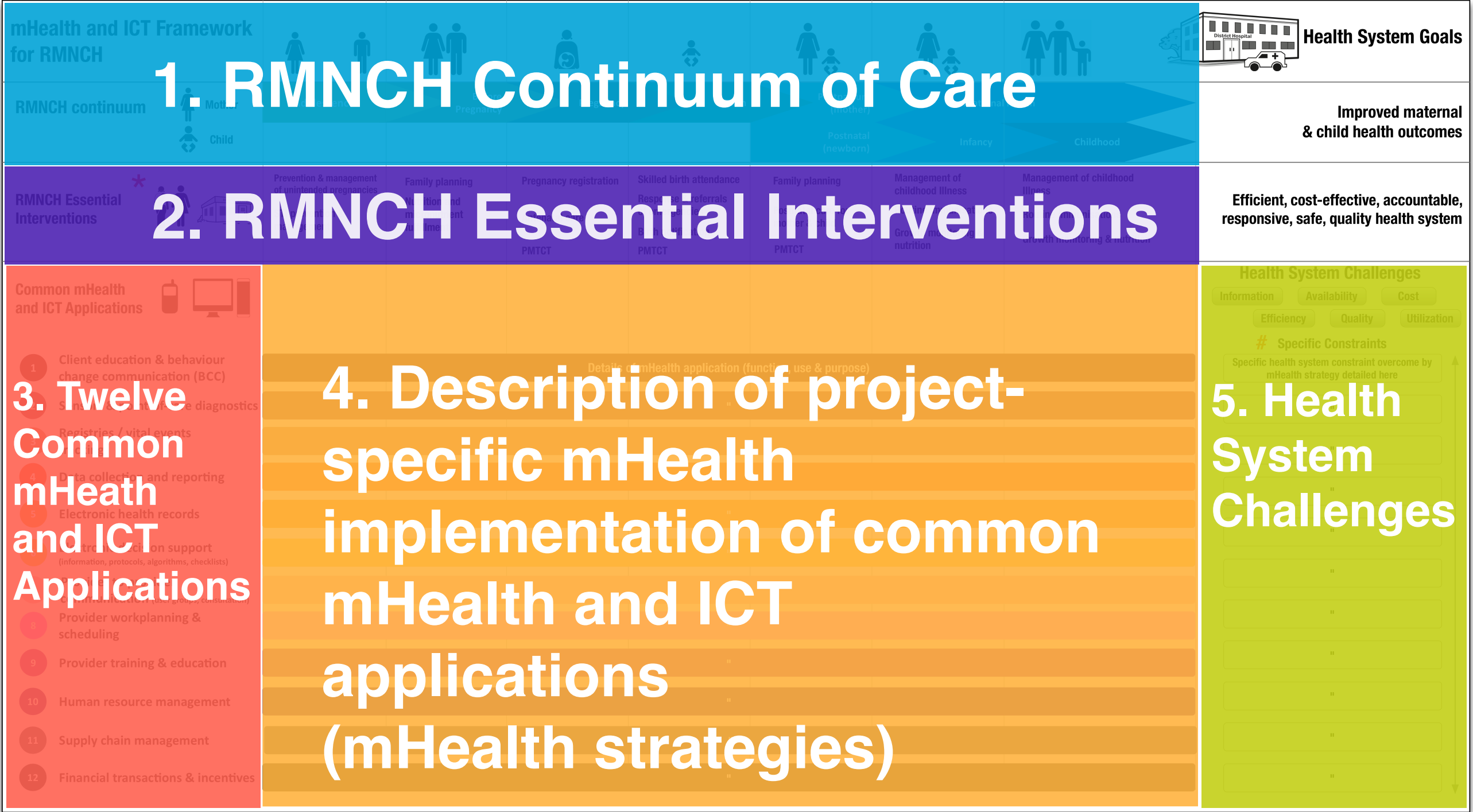
PART A, v 10.2



Components of the mHealth and ICT Framework for RMNCH

Project title or mHealth service package title here

PART A, v 10.2



Components of the mHealth and ICT Framework for RMNCH











WHEN ?

WHAT ?

HOW ?

**mHEALTH
COMMON
APPLICATION
USED**

Project title or mHealth service package title

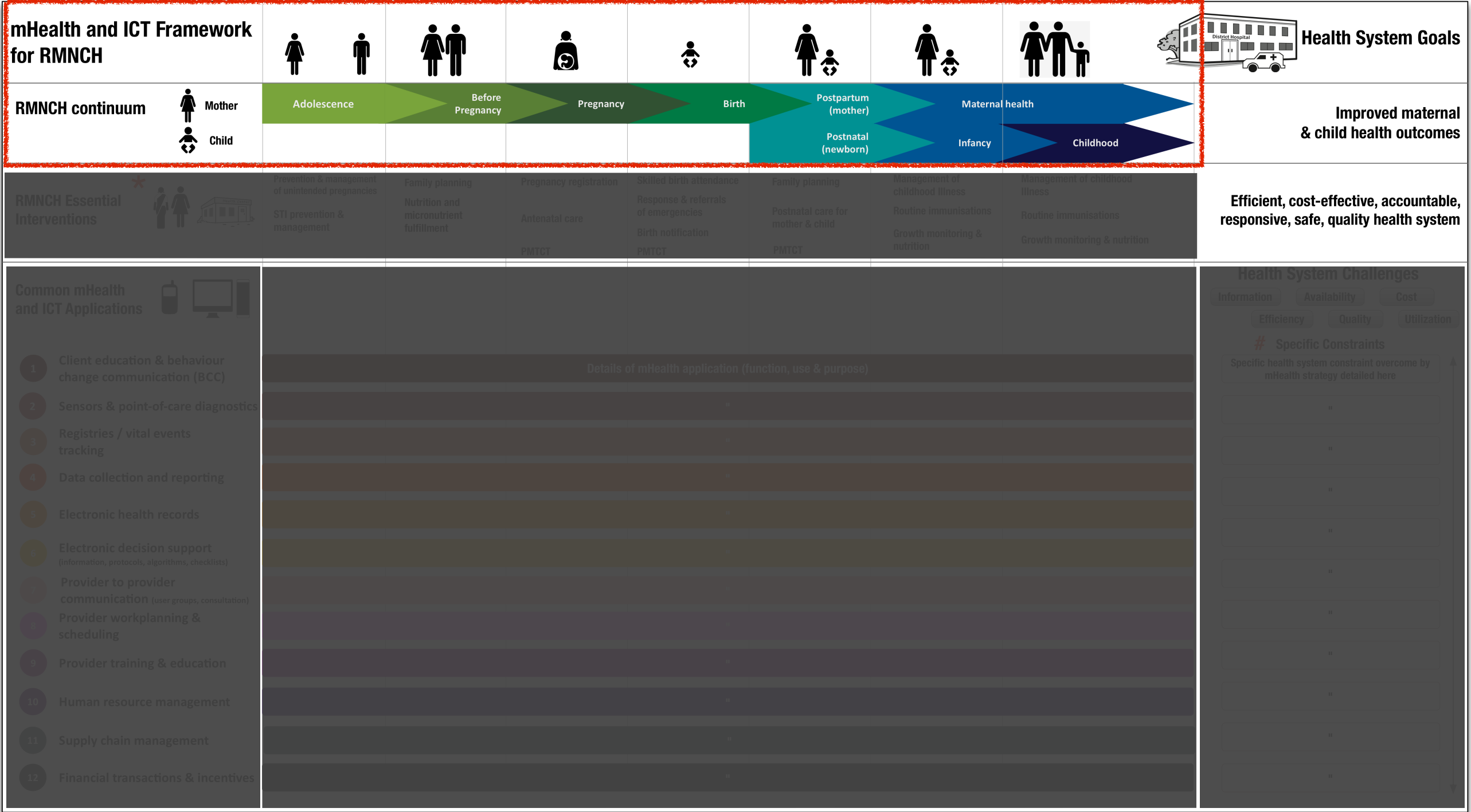
mHealth and ICT Framework for RMNCH	  	
RMNCH continuum   Mother Child	Adolescence	Before Pregnancy
RMNCH Essential Interventions   	Prevention & management of unintended pregnancies STI prevention & management	Family planning Nutrition and micronutrient fulfilment
Common mHealth and ICT Applications  		
1 Client education & behaviour change communication (BCC)		
2 Sensors & point-of-care diagnostics		
3 Registries / vital events tracking		
4 Data collection and reporting		
5 Electronic health records		
6 Electronic decision support (information, protocols, algorithms, checklists)		
7 Provider to provider communication (user groups, consultation)		
8 Provider workplanning & scheduling		
9 Provider training & education		
10 Human resource management		
11 Supply chain management		
12 Financial transactions & incentives		

Components of the mHealth and ICT Framework for RMNCH

Project title or mHealth service package title here

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1.



Uses RMNCH interventions known to Decision-makers

COMMUNITY LEVEL/HOME



FIRST LEVEL/OUTREACH



REFERRAL LEVEL/DISTRICT HOSPITAL



Components of the mHealth and ICT Framework for RMNCH

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2.






Components of the mHealth and ICT Framework for RMNCH

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mHealth and ICT Framework for RMNCH										 <div>Health System Goals</div>	
RMNCH continuum	 Mother	Adolescence		Before Pregnancy		Pregnancy	Birth	Postpartum (mother)	Maternal health		Improved maternal & child health outcomes
	 Child						Postnatal (newborn)		Infancy	Childhood	
RMNCH Essential Interventions	  	Prevention & management of unintended pregnancies	Family planning	Pregnancy registration	Skilled birth attendance	Family planning	Management of childhood illness	Management of childhood illness			Efficient, cost-effective, accountable, responsive, safe, quality health system
		STI prevention & management	Nutrition and micronutrient fulfillment	Antenatal care	Response & referrals of emergencies	Postnatal care for mother & child	Routine immunisations	Routine immunisations			
				PMTCT	PMTCT	PMTCT	Growth monitoring & nutrition	Growth monitoring & nutrition			

Common mHealth and ICT Applications



1

Client education & behaviour change communication (BCC)

2

Sensor & point-of-care diagnostics

3

Registries / vital events

4

Data collection and reporting

5

Electronic health records

6

Decision support (information, protocols, algorithms, checklists)

7

Personalised care (user groups, consultation)

8

Provider workplanning & scheduling

9

Provider training & education

10

Human resource management

11

Supply chain management

12

Financial transactions & incentives

Health System Challenges

Information

Availability

Cost

Efficiency

Quality

Utilization

#

Specific Constraints

Specific health system constraint overcome by mHealth strategy detailed here

3. Twelve Common mHealth and ICT Applications
- 1

Client education & behaviour change communication (BCC)
- 2

Small & portable diagnostics
- 3

Registries / vital events
- 4

Data collection and reporting
- 5

Electronic health records
- 6

Decision support (information, protocols, algorithms, checklists)
- 7

Community health worker (group, community)
- 8

Provider workplanning & scheduling
- 9

Provider training & education
- 10

Human resource management
- 11














Supply chain management
- 12

Financial transactions & incentives

Components of the mHealth and ICT Framework for RMNCH

Project title or mHealth service package title here

PART A, v 10.2

mHealth and ICT Framework for RMNCH										 <div>Health System Goals</div>
RMNCH continuum	 Mother	Adolescence		Before Pregnancy		Pregnancy		Birth		<div>Improved maternal & child health outcomes</div>
	 Child									
RMNCH Essential Interventions		Prevention & management of unintended pregnancies	Family planning	Pregnancy registration	Skilled birth attendance	Family planning	Management of childhood illness	Management of childhood illness	<div>Efficient, cost-effective, accountable, responsive, safe, quality health system</div>	
		STI prevention & management	Nutrition and micronutrient fulfillment	Antenatal care	Response & referrals of emergencies	Postnatal care for mother & child	Routine immunisations	Routine immunisations		
				PMTCT	PMTCT	PMTCT	Growth monitoring & nutrition	Growth monitoring & nutrition		
<div>Common mHealth and ICT Applications</div> <div></div> <div><div>1</div>Client education & behaviour change communication (BCC)</div> <div><div>2</div>Sensors & point-of-care diagnostics</div> <div><div>3</div>Registries / vital events tracking</div> <div><div>4</div>Data collection and reporting</div> <div><div>5</div>Electronic health records</div> <div><div>6</div>Electronic decision support (information, protocols, algorithms, checklists)</div> <div><div>7</div>Provider to provider communication (user groups, consultation)</div> <div><div>8</div>Provider workplanning & scheduling</div> <div><div>9</div>Provider training & education</div> <div><div>10</div>Human resource management</div> <div><div>11</div>Supply chain management</div> <div><div>12</div>Financial transactions & incentives</div>		<div>Health System Challenges</div> <div><div>Information</div><div>Availability</div><div>Cost</div><div>Efficiency</div><div>Quality</div><div>Utilization</div></div> <div># Specific Constraints</div> <div><div>Specific health system constraint overcome by mHealth strategy detailed here</div><div>"</div><div>"</div><div>"</div><div>"</div><div>"</div><div>"</div><div>"</div><div>"</div><div>"</div><div>"</div></div>								

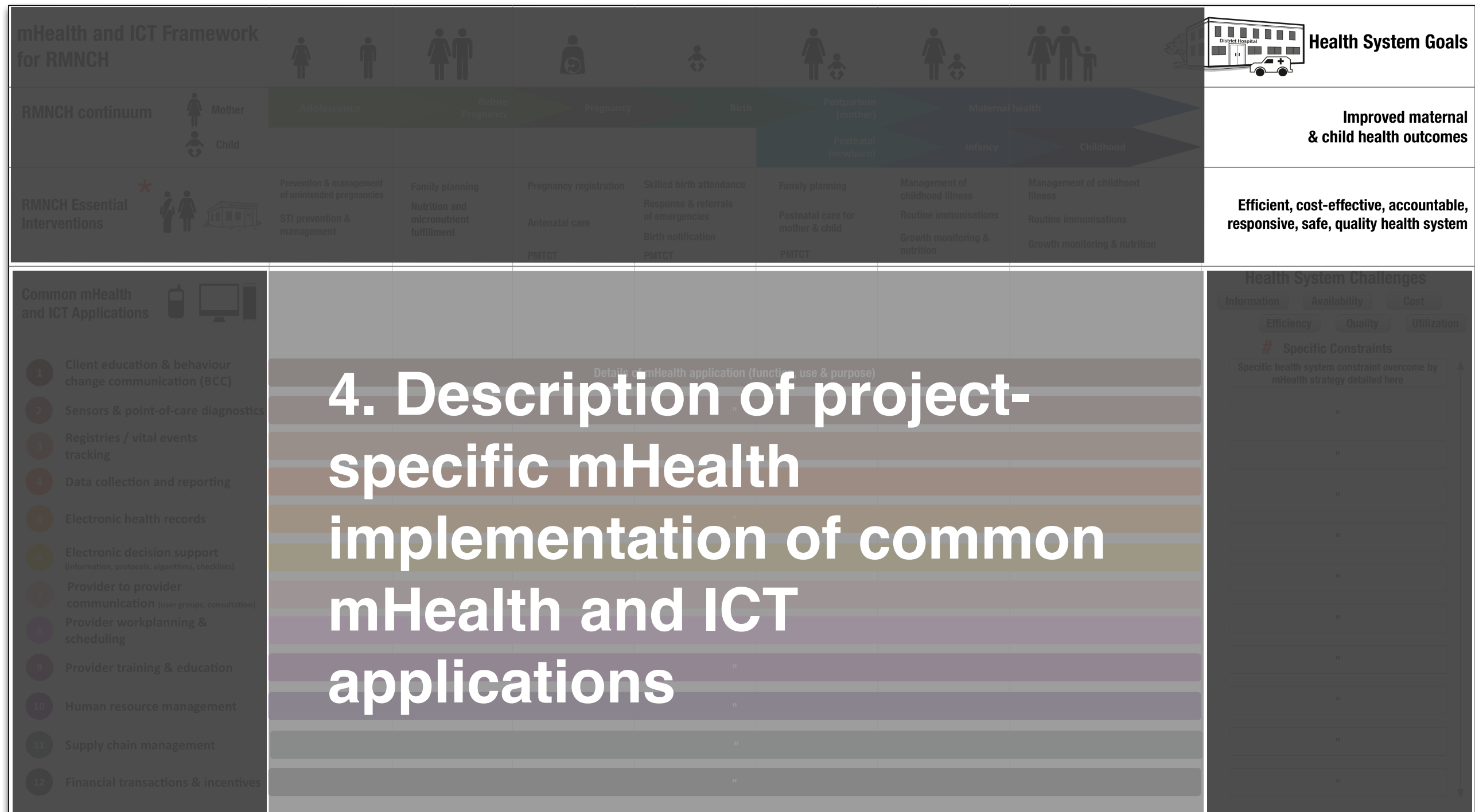
Common mHealth and ICT Applications

- 1 **Client education & behaviour change communication (BCC)**
- 2 **Sensors & point-of-care diagnostics**
- 3 **Registries / vital events tracking**
- 4 **Data collection and reporting**
- 5 **Electronic health records**
- 6 **Electronic decision support**
(information, protocols, algorithms, checklists)
- 7 **Provider to provider communication** (user groups, consultation)
- 8 **Provider workplanning & scheduling**
- 9 **Provider training & education**
- 10 **Human resource management**
- 11 **Supply chain management**
- 12 **Financial transactions & incentives**

Components of the mHealth and ICT Framework for RMNCH

Project title or mHealth service package title here

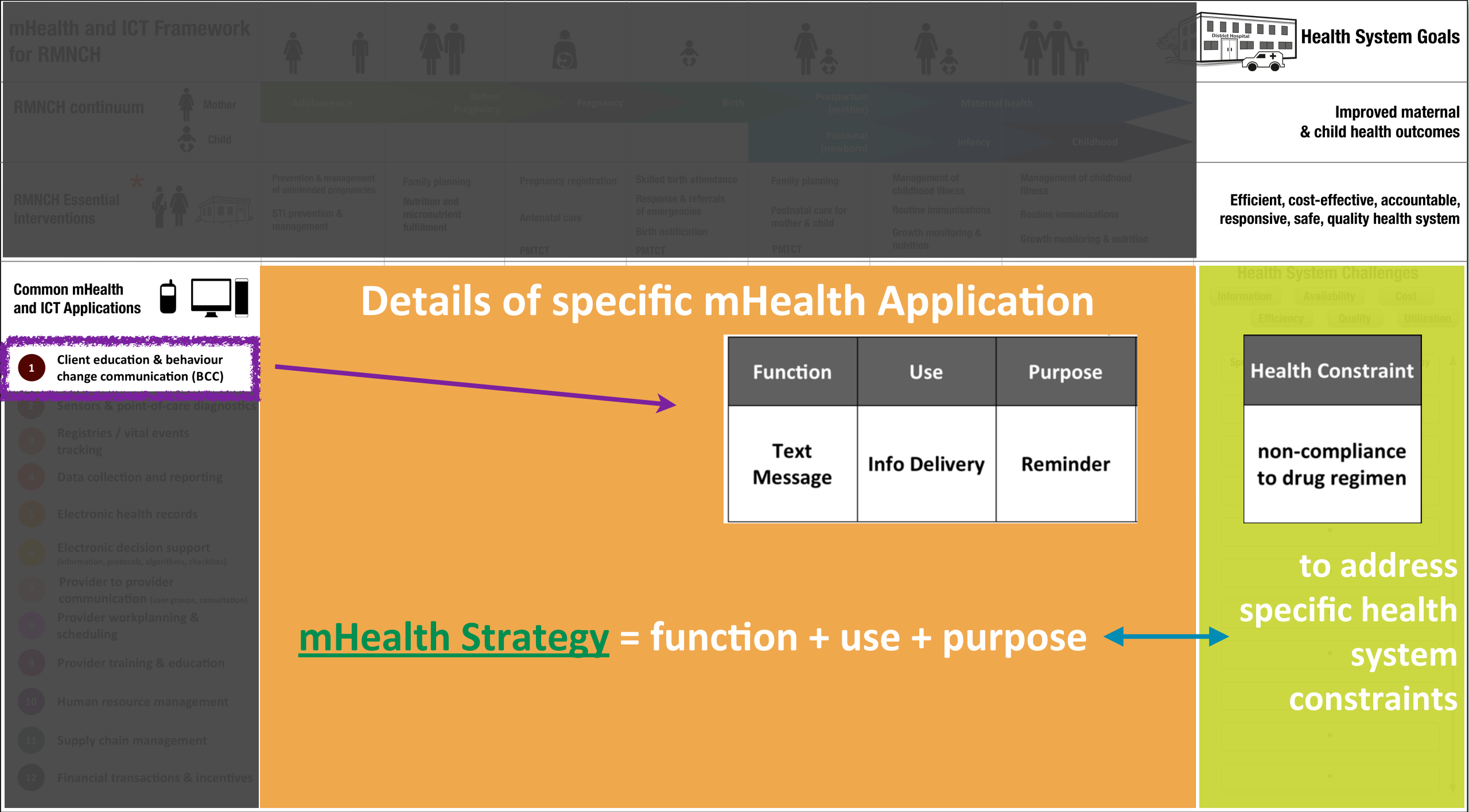
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Components of the mHealth and ICT Framework for RMNCH

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4.

Components of the mHealth and ICT Framework for RMNCH

4. DESCRIPTIONS of PROJECT- SPECIFIC mHEALTH STRATEGIES

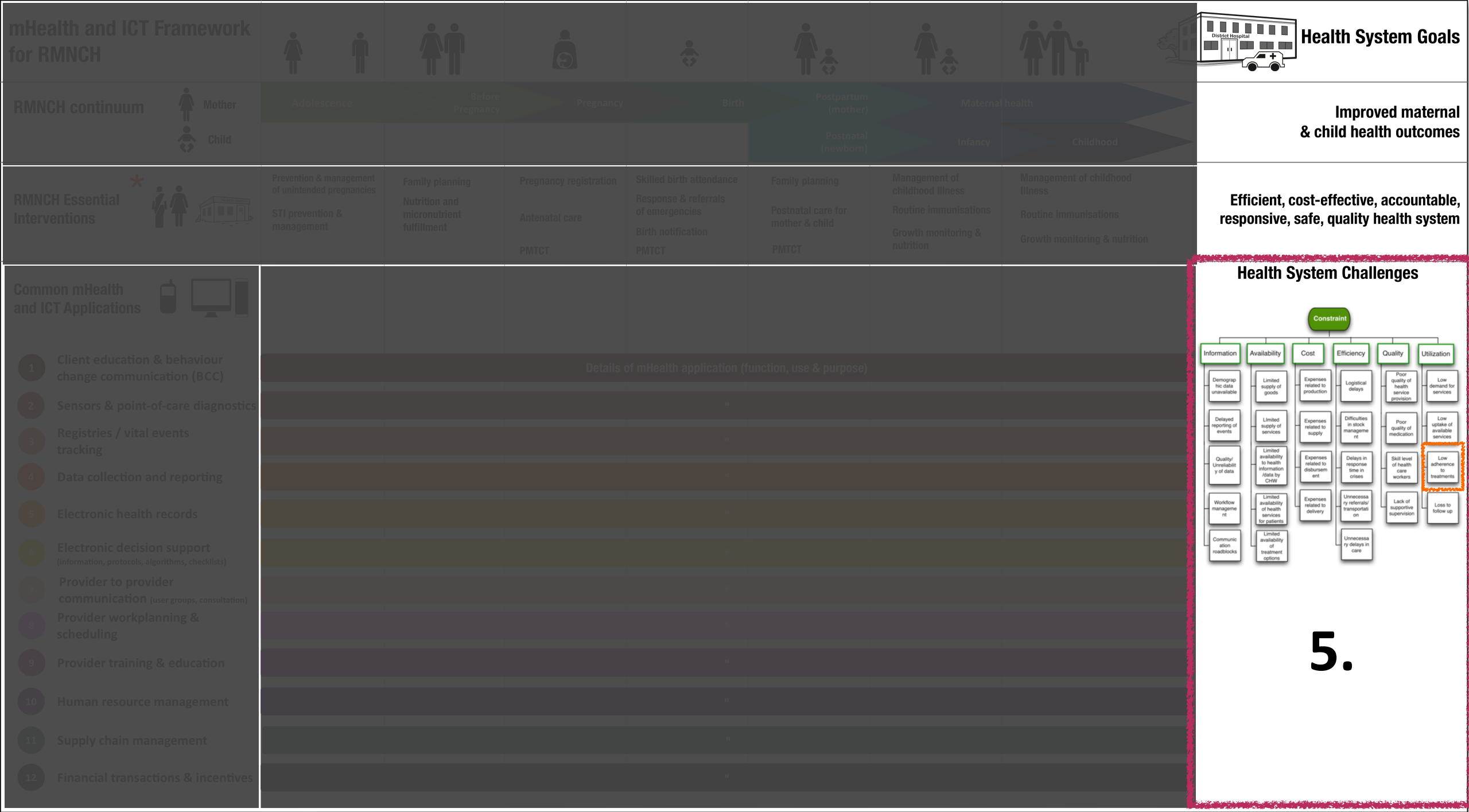
		Health System Goals
		Improved maternal & child health outcomes
Management of childhood illness Routine immunisations Growth monitoring & nutrition		Efficient, cost-effective, accountable, responsive, safe, quality health system
Health System Challenges		
<div>InformationAvailabilityCost</div> <div>EfficiencyQualityUtilization</div>		
# Specific Constraints		
Specific health system constraint overcome by mHealth strategy detailed here		

5. HEALTH SYSTEM CHALLENGES RELATED TO RMNCH INTERVENTIONS

Components of the mHealth and ICT Framework for RMNCH

Project title or mHealth service package title here

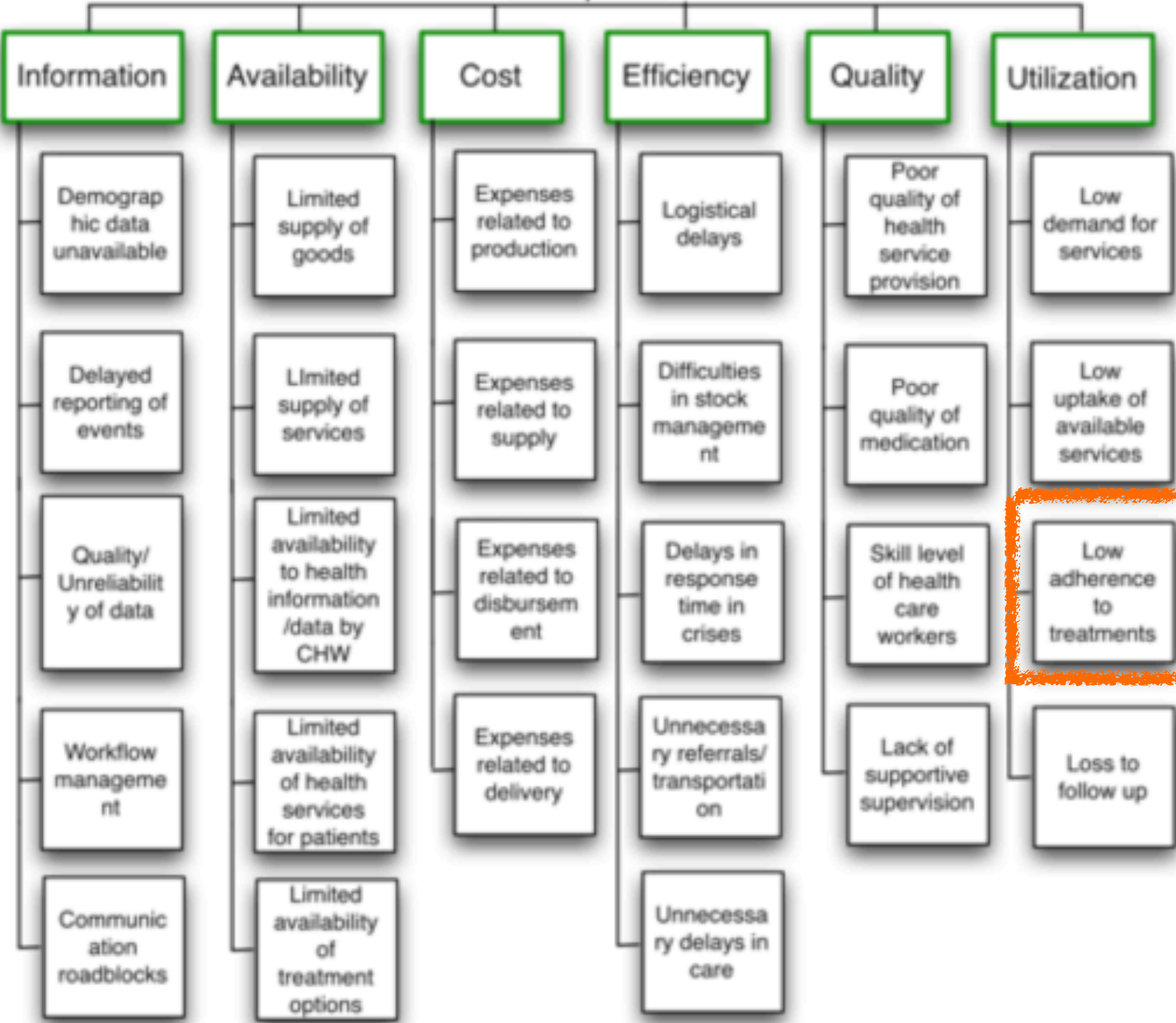
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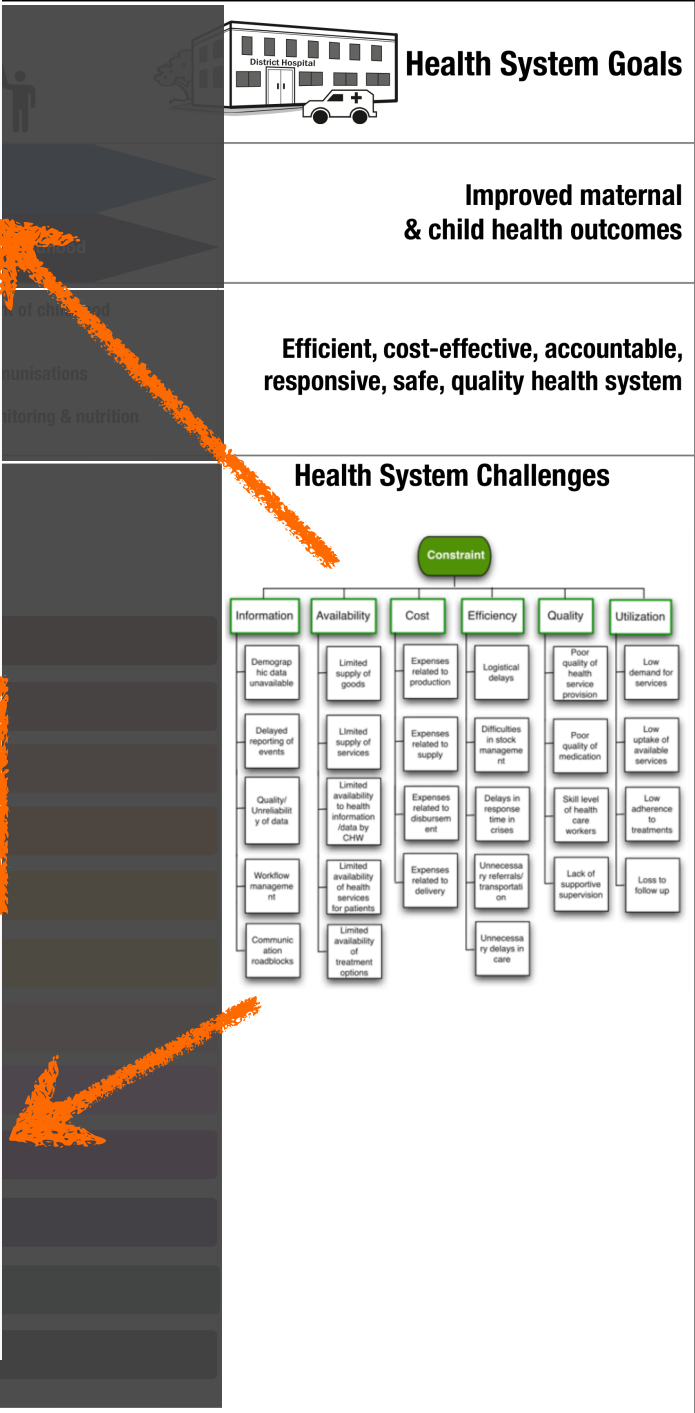
Components of the mHealth and ICT Framework for RMNCH

Project title or mHealth

5.



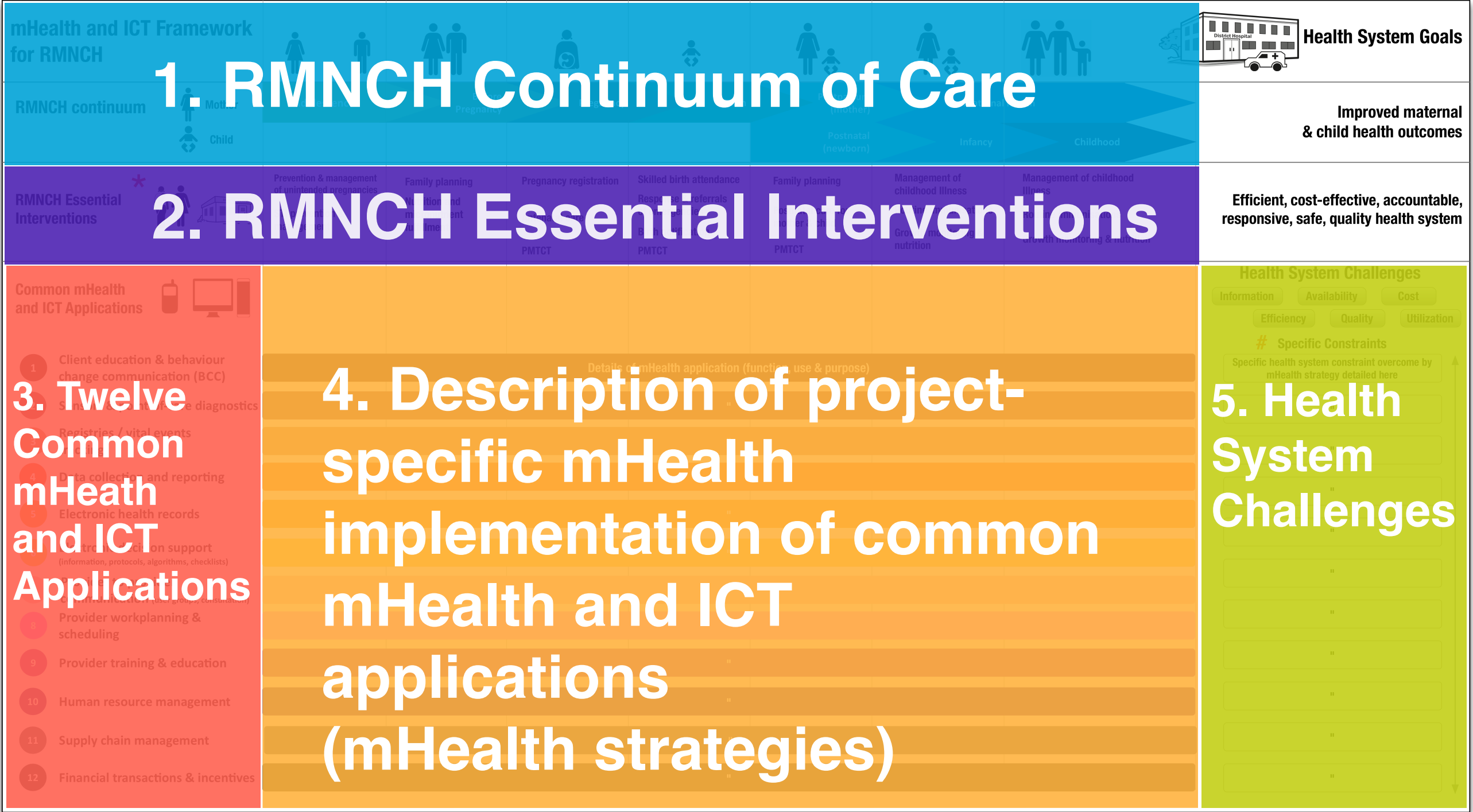
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Components of the mHealth and ICT Framework for RMNCH

Project title or mHealth service package title here

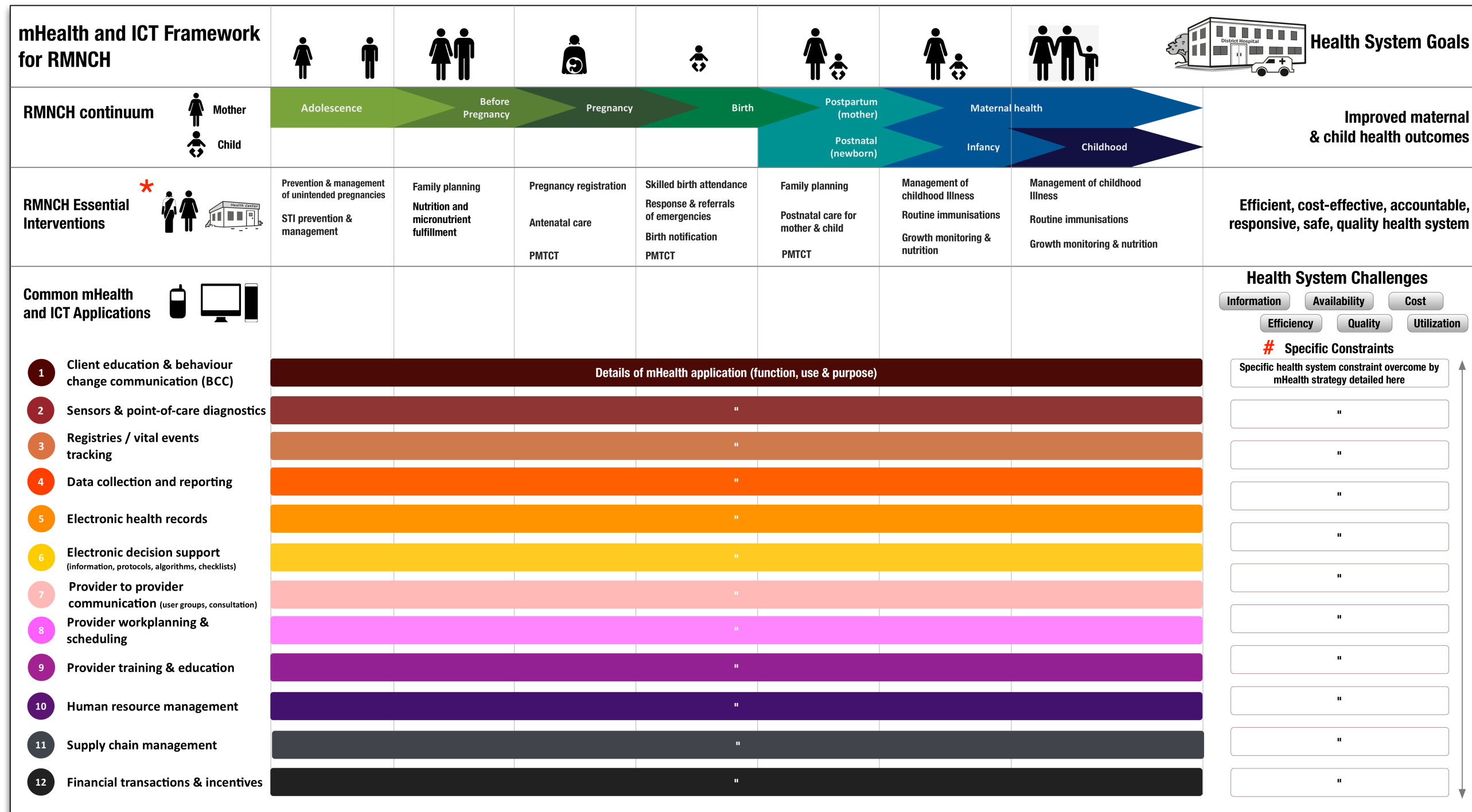
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Components of the mHealth and ICT Framework for RMNCH

Project title or mHealth service package title here

PART A, v 10.2



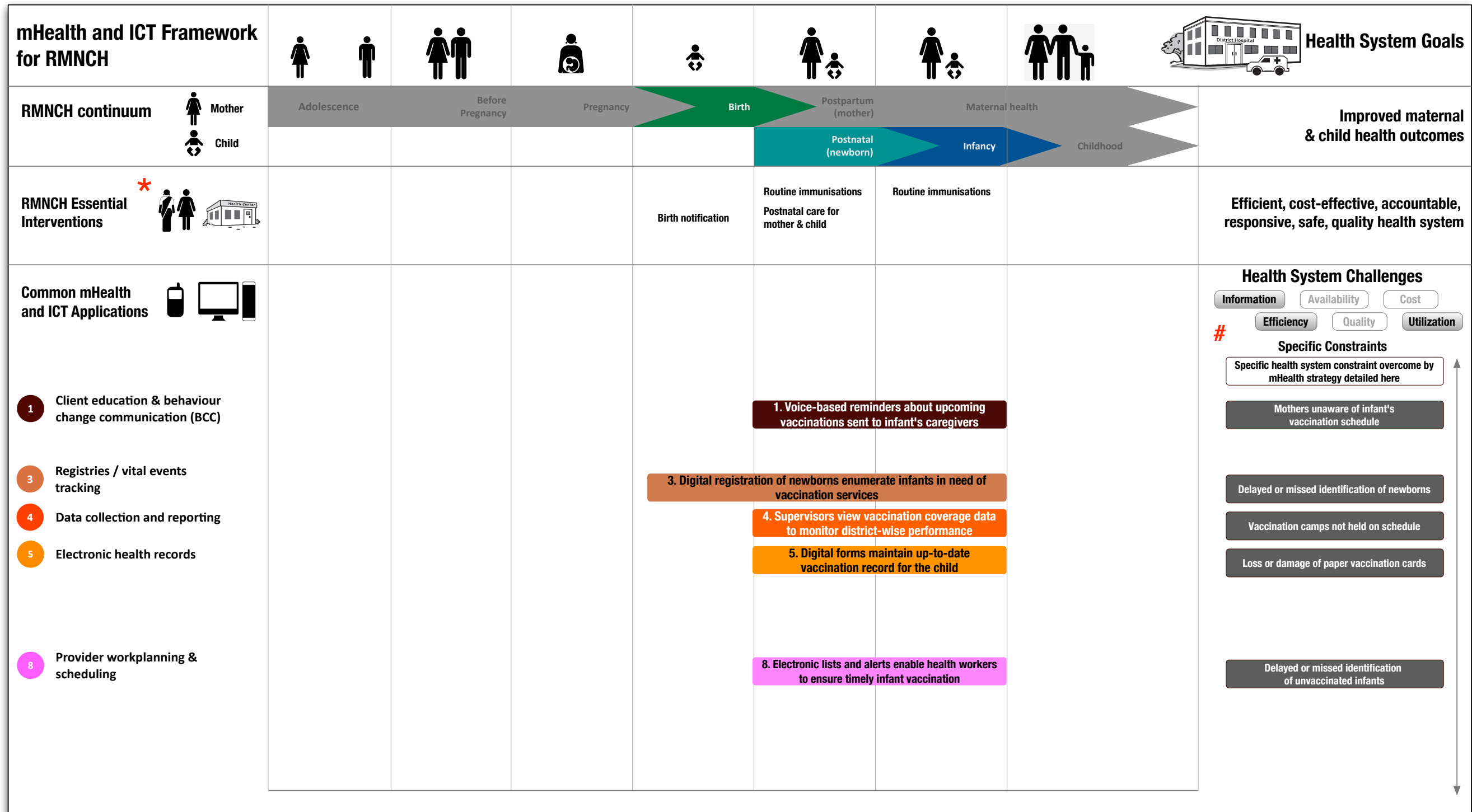
Why an mHealth and ICT Framework for RMNCH?

- Allows projects to focus on health systems strategy, not just the technology.
- Provides mHealth implementers a communication tool when talking with different stakeholders, including governments.
- Allows identification of uniqueness, commonalities and gaps across multiple mHealth solutions through the use of a consistent and health systems-focused vocabulary.
- Enables the cataloguing of **mHealth strategies** to which **evidence can be associated**

Project Vaccinate mHealth Service Package

Project Vaccinate service package

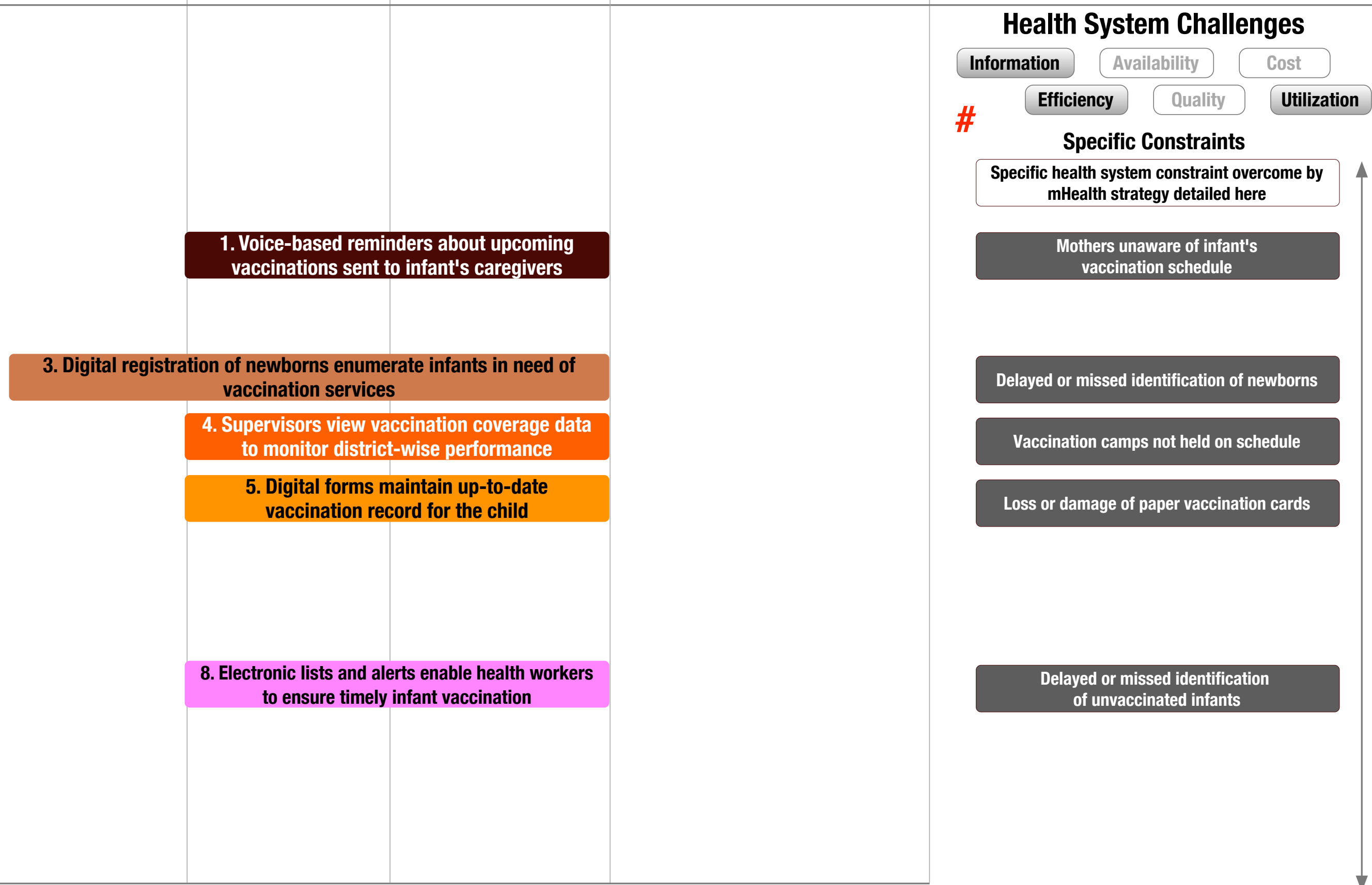
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* **NOTE:** The contents of this row as shown are for illustration only and will be replaced by packages of interventions listed in the upcoming WHO user guide for this framework

NOTE: Specific health system constraints targeted by the mHealth strategy are described in these boxes, categorised according to a pre-defined list -- information, availability, cost, efficiency, quality, utilisation-- from the upcoming WHO user guide for this framework.

Evidence for specific mHealth strategy?



Evidence for specific mHealth strategy?

				Health System Challenges		
				Information	Availability	Cost
				Efficiency	Quality	Utilization
				#	Specific Constraints	
				Specific health system constraint overcome by mHealth strategy detailed here		
1. Voice-based reminders about upcoming vaccinations sent to infant's caregivers				Mothers unaware of infant's vaccination schedule		
3. Digital registration of newborns enumerate infants in need of vaccination services				Delayed or missed identification of newborns		
4. Supervisors view vaccination coverage data to monitor district-wise performance				Vaccination camps not held on schedule		
5. Digital forms maintain up-to-date vaccination record for the child				Loss or damage of paper vaccination cards		
8. Electronic lists and alerts enable health workers to ensure timely infant vaccination				Delayed or missed identification of unvaccinated infants		

Evidence for each specific mHealth strategy?

			Health System Challenges		
			Information	Availability	Cost
			Efficiency	Quality	Utilization
			#	Specific Constraints	
			Specific health system constraint overcome by mHealth strategy detailed here		
1. Voice-based reminders about upcoming vaccinations sent to infant's caregivers	?Evidence?	Mothers unaware of infant's vaccination schedule			
3. Digital registration of newborns enumerate infants in need of vaccination services	?Evidence?	Delayed or missed identification of newborns			
4. Supervisors view vaccination coverage data to monitor district-wise performance	?Evidence?	Vaccination camps not held on schedule			
5. Digital forms maintain up-to-date vaccination record for the child	?Evidence?	Loss or damage of paper vaccination cards			
8. Electronic lists and alerts enable health workers to ensure timely infant vaccination	?Evidence?	Delayed or missed identification of unvaccinated infants			

WHO RHR Technical and Evidence Review Group (mTERG) on mHealth for Reproductive, Maternal, Newborn and Child Health

- Identify and define **criteria for evaluation** of evidence in mHealth
- Apply criteria to catalogue, review and **grade evidence**
- **Establish methods to develop recommendations** for mHealth solutions which are suitable for scale



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WHO Technical Advisory Group on mHealth Evidence

Evaluation Phase Research Questions

Functionality:
does the
mHealth package
function as
intended?

- Technical factors
- Organizational factors

Questions:

Can they use the mHealth tool?

HWs: Can they demonstrate ability to use the mHealth tool?

Usability: How
do users interact
with mHealth
package?

- User Coverage
- User Response
- User Adoption

Questions:

Do health workers actually use it?

HWs: Do they perceive benefits using the mHealth tool?

Effect: How does
the mHealth
package improve
health service
delivery?

- Availability
- Cost
- Efficiency
- Quality
- Utilization

Questions:

Are there health system improvements resulting from use of mHealth package?

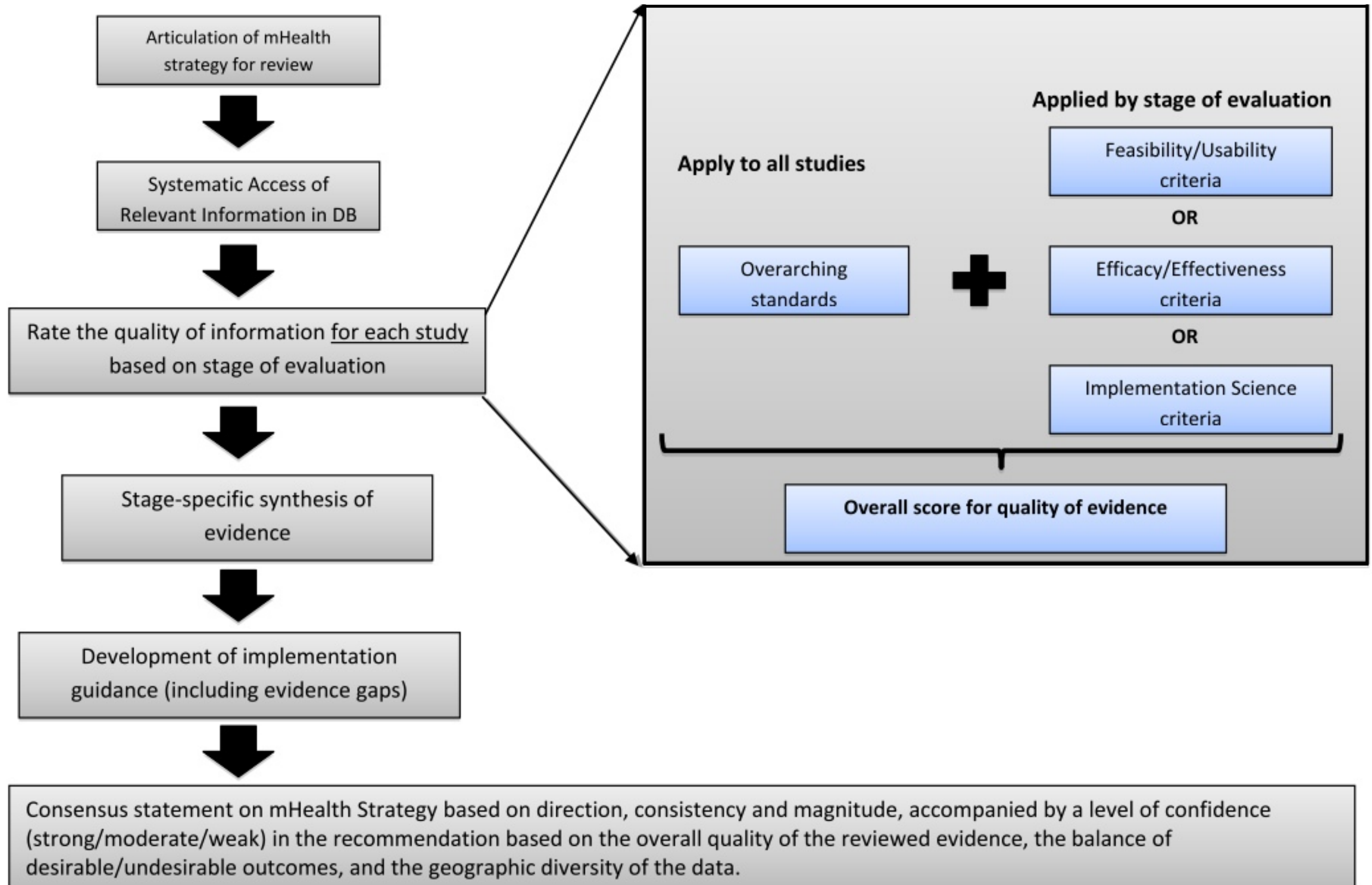
Outcomes: Does
mHealth package
improvements in
service delivery
affect health?

- Improved health outcomes

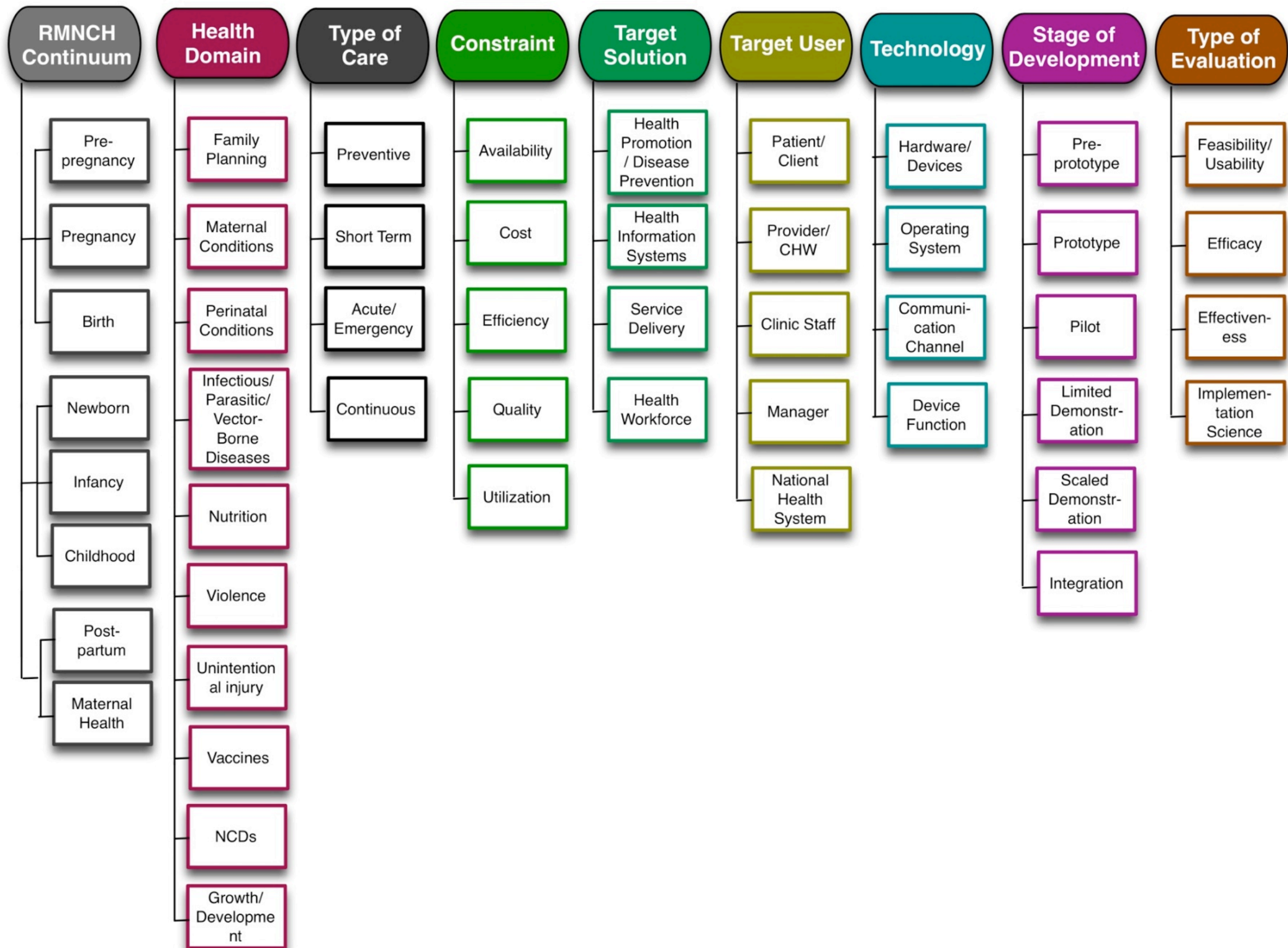
Questions:

Are there improved health outcomes resulting from use across multiple health workers use?

Overview of the proposed mHealth evidence synthesis Process



Taxonomy for mHealth and RMNCH



WHO Guidance for mHealth for RMNCH

will need to be based on synthesis
of evidence of mHealth strategies
strengthening effective coverage
of validated RMNCH interventions



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Illustrative Statement

“Strong recommendation for the application of mobile phone short message service reminders for antiretroviral treatment adherence”



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Evidence-based Guidance

- The **quality of the evidence determines the strength of recommendation** to governments
- Use of the best available evidence to make the most appropriate recommendations
- Emphasis on rigorous studies and systematic reviews
- Grading of Recommendations Assessment, Development and Evaluation - **GRADE framework** - to evaluate the quality of the evidence ==> basis of recommendations

Objective

Determine evidence-informed packages of mHealth strategies consisting of specific functions with specific purpose that can be recommended for national adoption.

Evidence synthesis

The periodic meetings of the WHO Technical and Evidence Review Group on mHealth for RMNCH will generate findings that will drive the development of statements on **evidence-based mHealth strategies that should be recommended for strengthening RMNCH.**



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Thank you.

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