

# Digital Health Profiles & Maturity Assessment in the Pacific Island Countries

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# Agenda

- **What is the Digital Health Maturity Model?**
  - Aims and objectives
  - Foundations
- **Assessment process & reflections**
- **Findings**
  
- **Group Activity!**
  - Objectives & parameters
  - Key questions & prompts...

# Aims & Objectives

1. Assess **National Digital Health Maturity (DHM)** realistically
  - Establishing the current National DHM Profile
2. Set **SMART** goals, indicators, and **practical strategies** to achieve the **next level DHM**;
  - Articulate an aspirational DHM state
3. Co-develop a pragmatic **implementation plan** for the **digital health roadmap**;
  - Plotting the trajectory of improvement
4. Embed a quality **monitoring & improvement** plan
  - Ensuring that improvement is measurable and verifiable

“Co-develop a strategy with simple, measurable, achievable, realistic and time limited (SMART) objectives that are aligned with the digital health maturity to ensure that interventions are implementable and sustainable in all settings”

# Activity Flowchart



## USER:

Country X (~100 K population) wants to improve the access to health services using digital health solutions/interventions. A working group (WG) has been formed to analyze the current state and develop a strategic direction and recommended way forward to the Ministry of Health. The WG suggests using the DHPMAT as an ongoing assessment and planning tool to facilitate its work.

## VALIDATION

## FACILITATION

## DECISION

### [A] Review the DHPMAT

### [B] Review Existing Experience

### [C] Put in Context

### [D] Discuss & Prioritize

### [E] Get Real

“what is the current state of digital health in the country?”

“how might we improve current digital health programs?”

“what are the potential digital health interventions?”

“example of low-hanging fruit: draw on the high mobile coverage to develop health services on mobile platform/telehealth.”

“what are the achievable and measurable objectives? in what time frame?”

“where are we at? compared to our PIC peers?”

“what are our opportunities, and resource / funding availabilities?”

“example of mid-term intervention: invest in the foundations of health information sharing.”

“what is the implementation plan / road map?”

WG uses the DHPMAT to gain a high-level understanding of the current development

WG reviews lessons from QI & monitoring of existing projects & programs

WG identifies potential interventions based on DHPMAT and documented rationale

“invest in the country’s large young population in preparing the technical talent for the long term.”

“what is the governance mechanism for implementation? operations?”

WG validates the digital maturity level and documents the rationale

WG uses the outputs from previous steps to develop and prioritize options

WG develops plans to implement and evaluate the intervention(s)

# What is National Digital Health Maturity?

## Defining National DH Maturity

“the stage of growth and development of *intrinsic ability* and the *availability of mechanisms & tools* that actors can use to enhance the country’s sociotechnical capability to deliver digital health”.

## Digital Health Maturity Principles

- DHM is used to determine resources for DH planning and strategy development, implementation and quality improvement;
- DHM is used to guide the adoption/adaptation of digital public goods and development of standard operating procedures;
- DHM is a necessary indicator for all digital health strategies and interventions i.e. an outcome measure!

# What are the DHM Foundations?

Digital Health Foundations	Foundation's components
<b><i>ICT infrastructure, equity &amp; affordability</i></b>	<i>Available, Reliable &amp; Affordable? Power &amp; Bandwidth? Fibre-optic cables (submarine/land)? Satellite? Wireless? Stable IoT network? Multisectoral ICT , e.g., eBusiness, eHealth? eGov?)</i>
<b><i>Essential digital tools</i></b>	<i>Unique Health ID system? EHR? HIS/HIMS? Telehealth/mobile health? Integrated digital tools? ICT for CRVS, disease registries, clinical care &amp; social services? Social media for health purposes?)</i>
<b><i>Readiness for information sharing</i></b>	<i>National enterprise architecture? Standards for Interoperability &amp; data quality? Legal frameworks to regulate for data security, privacy &amp; DH innovations (e.g. AI), Data exchange within and across organisations &amp; sectors?</i>
<b><i>Enablers of adoption and trust</i></b>	<i>National digital health vision &amp; strategy? Digital health governance &amp; structure? Champions &amp; role models? Digital health policy &amp; strategy with budget? Workforce capacity? Formal and on- the-job training for digital competencies?</i>
<b><i>Quality improvement, monitoring &amp; evaluation (QIMME)</i></b>	<i>Ensuring ongoing measurable and verifiable progress through the use of program logic and Comparative Effectiveness Research (CER)</i>

# Digital Health Maturity Assessment

Essential digital health foundations	Digital Health Maturity Levels (with examples)				
	LEVEL 1 BASIC UNPREDICTABLE KNOWLEDGE & DATA NOT SHARED	LEVEL 2 CONTROLLED REACTIVE & PROBLEM DRIVEN KNOWLEDGE & DATA SILOS COMMON	LEVEL 3 STANDARDISED REQUEST DRIVEN ORGANISATION LEVEL KNOWLEDGE & DATA SHARING	LEVEL 4 OPTIMISED SERVICE DRIVEN CROSS ORGANISATION KNOWLEDGE SHARING & COLLABORATION	LEVEL 5 INNOVATIVE VALUE DRIVEN ENTERPRISE-WIDE KNOWLEDGE SHARING & COLLABORATION
<b>ICT &amp; IoMT infrastructure</b> e.g. penetration, affordability, reliability, ICT supply chain	<u>Examples:</u> Available but unaffordable and unreliable Internet & supply chain	<u>Examples:</u> Affordable & somewhat reliable Internet and supply chain	<u>Examples:</u> Support services and ICT hardware (supply chain) mostly accessible	<u>Examples:</u> Fully accessible & timely support services and ICT hardware	<u>Examples:</u> Infrastructure & support services facilitate innovations
<b>Essential tools</b> e.g. unique ID, social media, HIS/eHR/eMR, mHealth, teleHealth	<u>Examples:</u> Local ad hoc adoption & use of digital tools; Telephone = telehealth	<u>Examples:</u> Regional coordination of adoption & use of digital tools; Asynchronous info sharing	<u>Examples:</u> National benchmarks & standards for digital tools; Synchronous info sharing	<u>Examples:</u> Data analytics & Quality of real-world data; teleHealth integrated with eHR	<u>Examples:</u> Innovations with decision support systems with integrated teleHealth and eHR systems
<b>Readiness for information sharing</b> e.g. standards-based, interoperable, hardware, software & protocols to support security & privacy	<u>Examples:</u> Standalone datasets; No terminology standards	<u>Examples:</u> Ad-hoc sharing of datasets; Local terminology	<u>Examples:</u> Data sets integrated with HIS; National terminology	<u>Examples:</u> Data shared & interoperable; Data-driven policy & practice	<u>Examples:</u> National Common Data Model driving ethical use of linked health data for innovations
<b>Enablers of adoption</b> e.g. regulations, policy, strategy, governance, capacity building, funding	<u>Examples:</u> No digital health legislation; No training programs; No governance structures	<u>Examples:</u> Digital health privacy/security legislations; Ad-hoc training programs; Ad-hoc governance	<u>Examples:</u> Other digital health legislations; Accredited training programs; Relevant digital health committees	<u>Examples:</u> Artificial Intelligence legislation; National training programs; National digital health agency	<u>Examples:</u> Legislation facilitate innovations; Multisectoral programs; Digital health ministry
<b>Quality improvement, measurement, monitoring &amp; evaluation (QIMME)</b>	<u>Examples:</u> Local ad hoc QIMME activities	<u>Examples:</u> QIMME routinely embedded in digital health programs	<u>Examples:</u> QIMME coordinated for CER across programs and regions	<u>Examples:</u> National digital health program with embedded QIMME enabling CER	<u>Examples:</u> Innovating with novel QIMME methods for new models of care

# DH Maturity Assessment: Reflecting on Process

Benefits	Challenges
Transparent and <b>definable</b>	Risk of ' <b>deficit framing</b> ' (i.e. absence of... )
Transparent ' <b>standards-based</b> ' benchmarking	'Impression' of inter-country <b>comparison</b>
Progressive, in discrete stages	Overly formulaic, rigid, with redundancies
Conducted <b>online</b>	Conducted during <b>COVID-19</b> pandemic (difficult scheduling → data representativeness)
' <b>Co-creation</b> ' & co-design	Discussion, <b>negotiation</b> , & consensus
'Academic <b>objectivity</b> '	'Positionality' within/outside the Pacific <b>context</b>



# Staging Digital Health Maturity: The Model

<b>Digital Health Foundations</b>	<b>1. BASIC:</b> Unpredictable; uncoordinated; Knowledge not shared.	<b>2. CONTROLLED:</b> Coordinated but inconsistent; Knowledge silos.	<b>3. STANDARDISED:</b> Performance consistent; Standards adopted; knowledge sharing
<b>ICT infrastructure, equity &amp; affordability</b>	<ul style="list-style-type: none"> <li>• Unreliable Internet, Unreliable 3G, 4G</li> <li>• Very low percentage of the population have access to the Internet</li> <li>• &lt;10% broadband service subscriptions</li> <li>• Unreliable power supply</li> </ul>	<ul style="list-style-type: none"> <li>• Internet, 2G, 3G, 4G somewhat reliable</li> <li>• c. 50% population have Internet access</li> <li>• c.50% broadband service subscriptions</li> <li>• Parts/services available in weeks</li> </ul>	<ul style="list-style-type: none"> <li>• Reliable Internet, Reliable 2G, 3G, 4G</li> <li>• &gt;50% population have Internet access</li> <li>• &gt;50% broadband service subscriptions</li> <li>• Parts/services available in-house</li> </ul>
<b>Essential digital tools</b>	<ul style="list-style-type: none"> <li>• Non-unique Health ID system</li> <li>• Local procurement &amp; implementation of HIS/EHR</li> <li>• Use of social media</li> <li>• Telephone consultation</li> </ul>	<ul style="list-style-type: none"> <li>• Unique ID in Dept</li> <li>• Jurisdictional procurement &amp; implementation of HIS/EHR</li> <li>• Social media for information</li> <li>• Asynchronous files &amp; image sharing</li> </ul>	<ul style="list-style-type: none"> <li>• Unique ID in all of facility</li> <li>• National benchmarks &amp; standards for HIS/EHR</li> <li>• Social media for wellbeing apps</li> <li>• Synchronous video consult</li> </ul>
<b>Readiness for information sharing</b>	<ul style="list-style-type: none"> <li>• Ad-hoc sharing of patient registry data with HIS/eHR or CRVS</li> <li>• No terminology standards</li> </ul>	<ul style="list-style-type: none"> <li>• Patient info shared routinely but not integrated with HIS/EHR</li> <li>• Ad-hoc terminology standards</li> </ul>	<ul style="list-style-type: none"> <li>• Patient info integrated in HIS/eHR and shared in facility</li> <li>• National standard terminology recommended</li> </ul>
<b>Enablers of adoption and trust</b>	<ul style="list-style-type: none"> <li>• No digital health regulations</li> <li>• No existing national strategy for DH or HIS</li> <li>• No training programs</li> <li>• No governance structures</li> </ul>	<ul style="list-style-type: none"> <li>• Privacy legislation present</li> <li>• National strategy for DH/HIS is drafted or in process</li> <li>• Ad-hoc training programs</li> <li>• Ad-hoc governance structures</li> </ul>	<ul style="list-style-type: none"> <li>• ICT legislation present</li> <li>• National DH strategy and with priorities endorsed and implemented</li> <li>• Accredited training programs</li> <li>• ICT committee within organisational management</li> </ul>
<b>QIMME</b>	<ul style="list-style-type: none"> <li>• Ad-hoc QIME arrangements if at all</li> </ul>	<ul style="list-style-type: none"> <li>• QIME incorporated but uncoordinated</li> </ul>	<ul style="list-style-type: none"> <li>• Coordinated QIME for Comparative Effectiveness Research (CER) by regions</li> </ul>

Essential digital health foundations <sup>14</sup>	LEVEL 1 BASIC UNPREDICTABLE KNOWLEDGE & DATA NOT SHARED	LEVEL 2 CONTROLLED REACTIVE & PROBLEM DRIVEN KNOWLEDGE & DATA SILOS	LEVEL 3 STANDARDISED REQUEST DRIVEN KNOWLEDGE & DATA SHARING
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<u>Readiness for information sharing</u> e.g. standards-based, interoperable, hardware, software & protocols to support security & privacy	<u>Examples:</u> Standalone datasets; No terminology standards	<u>Examples:</u> Ad-hoc sharing of datasets; Local terminology	<u>Examples:</u> Data sets integrated with HIS; National terminology
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# Step 1: Assessing National Digital Health Maturity

## Country context

Harness digital health to strengthen health systems to support integrated person-centred services, quality improvement, population health programs & policy

- **Health priorities:** e.g. universal health coverage through universal health insurance
- **Objectives** for digital health development: Improve digital health maturity by one level
- **Opportunities:** e.g. current strengths; Entry points (individual, facility or population); Donor Agencies
- **Challenges:** e.g. rurality; low digital health literacy; proprietary systems; sustainability

## Objective of digital health development

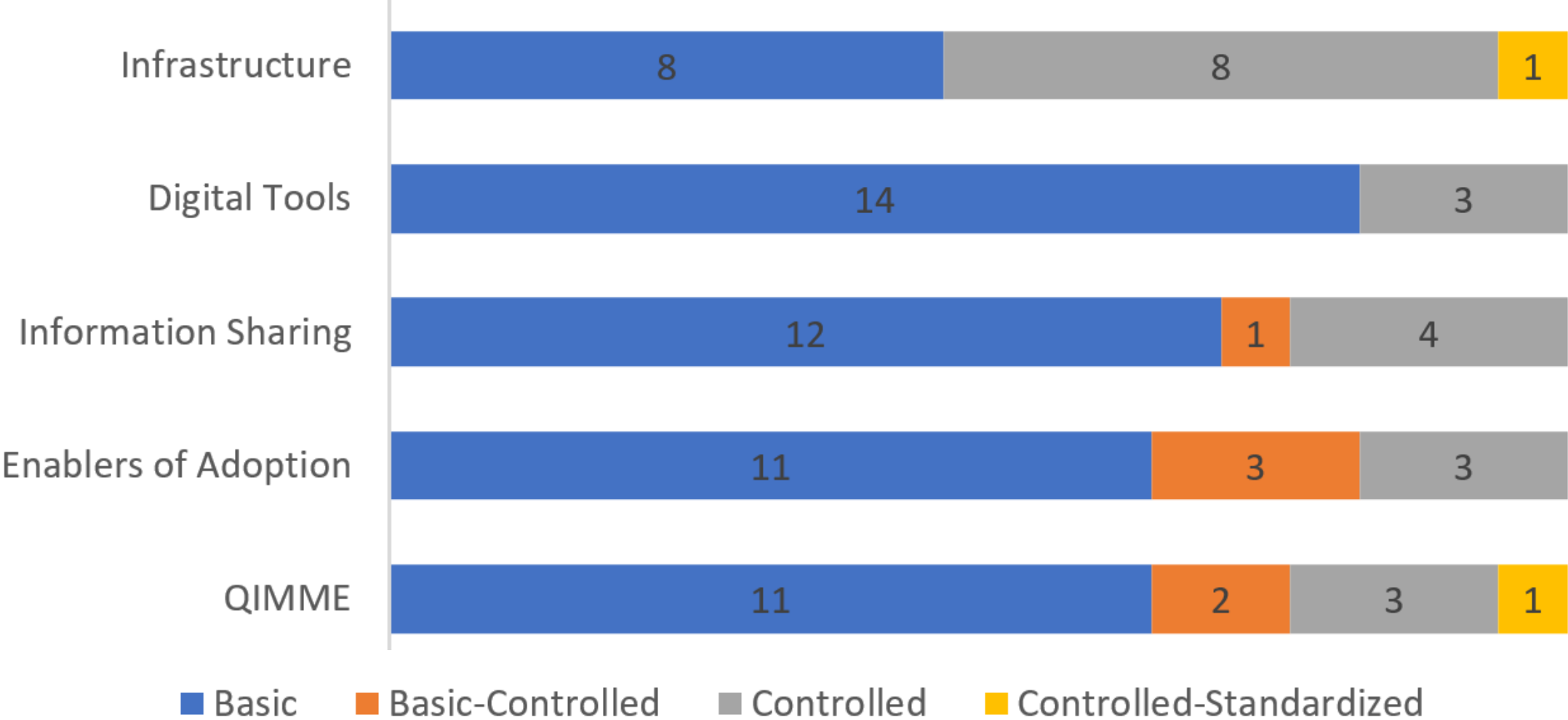
Enterprise-wide architecture & platform to support interoperable digital tools and data

- **Articulate a vision and mission?**
- **Practical goal:** e.g. Co-develop a strategy with simple, measurable, achievable, realistic and time limited (SMART) objectives that are aligned with the digital health maturity to ensure that interventions are implementable and sustainable in all settings e.g. urban-rural, rich-poor, young-old, male-female, etc.

# Step 2: Assessing National Digital Health Maturity

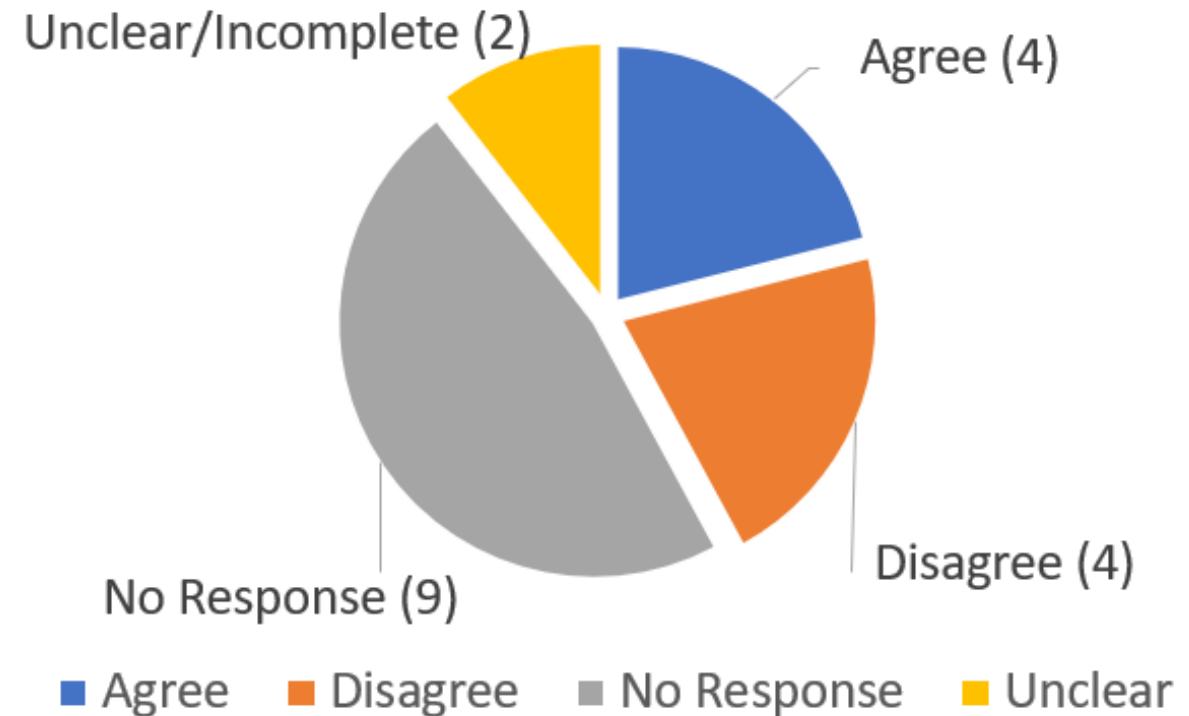
DH Foundations	Current DH maturity level (as assessed)	Desired maturity level (1 step up!)
<i>ICT infrastructure, equity &amp; affordability</i>	(Current maturity level: <b>Basic</b> ) A mobile phone network that is not stable, equitable or affordable for all citizens.	<b>Desired Maturity level: Standardised</b> <ul style="list-style-type: none"> <li>Identify evidence-based, reliable, cost-effective and sustainable options;</li> <li>Seek ICT infrastructure funding for standards-based mHealth infrastructure.</li> </ul>
<i>Essential digital tools</i>	(Current maturity level: <b>Controlled</b> ) Digital health tools are not consistently stable, usable, useful or evidence-based.	<b>Desired Maturity level: Standardised</b> <ul style="list-style-type: none"> <li>Compliance to standards for digital health tools, including affordability;</li> <li>A national unique person (patient/clinician) and facility identifier system.</li> </ul>
<i>Readiness for information sharing</i>	(Current maturity level: <b>Controlled</b> ) Data & information are of uncertain quality or interoperability to enable useful sharing.	<b>Desired Maturity level: Standardised</b> <ul style="list-style-type: none"> <li>Identify relevant national/international standards for data, data models, architecture, and data analytics;</li> <li>Establish data and information governance and stewardship structures.</li> </ul>
<i>Enablers of adoption and trust</i>	(Current maturity level: <b>Controlled</b> ) The competencies of the digital health workforce is not accredited or maintained	<b>Desired Maturity level: Standardised</b> <ul style="list-style-type: none"> <li>Pre- &amp; in-service training of workforce in digital health e.g. tools, e-learning;</li> <li>Digital literacy programs in schools, colleges and work places.</li> </ul>
<i>QIMME</i>	(Current maturity level: <b>Controlled</b> ) The program logic of current projects is not explicit at the project level e.g. RE-AIM, outputs and impacts.	<b>Desired Maturity level: Standardised</b> <ul style="list-style-type: none"> <li>A QIMME program for digital health intervention across many centre, emphasizing measurable process, outputs and impact indicators along with realistic deliverables and milestones.</li> </ul>

# Findings: DH Maturity of PICs (by DHM Foundations)



# Pre-meeting activity results (Feedback)

- We invited 19 countries to provide feedback, validate, and/or critique the findings →
- This feedback is critical for today's group session to define
  - National priorities
  - DH Objectives & goals
  - Opportunities & Challenges



Let's have a look at an example of a completed DHMPAT process...

# The DHPMAT process: a case study of a small PIC



### USER:

Country X (~100 K population) wants to improve the access to health services using digital health solutions/interventions. A working group (WG) has been formed to analyze the current state and develop a strategic direction and recommended way forward to the Ministry of Health. The WG suggests using the DHPMAT as an ongoing assessment and planning tool to facilitate its work.

## VALIDATION

## FACILITATION

## DECISION

### [A] Review the DHPMAT

### [B] Review Existing Experience

### [C] Put in Context

### [D] Discuss & Prioritize

### [E] Get Real

“what is the current state of digital health in the country?”

“how might we improve current digital health programs?”

“what are the potential digital health interventions?”

“example of low-hanging fruit: draw on the high mobile coverage to develop health services on mobile platform/telehealth.”

“what are the achievable and measurable objectives? in what time frame?”

“where are we at? compared to our PIC peers?”

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“example of mid-term intervention: invest in the foundations of health information sharing.”

“what is the implementation plan / road map?”

WG uses the DHPMAT to gain a high-level understanding of the current development

WG reviews lessons from QI & monitoring of existing projects & programs

WG identifies potential interventions based on DHPMAT and documented rationale

“invest in the country’s large young population in preparing the technical talent for the long term.”

“what is the governance mechanism for implementation? operations?”

WG validates the digital maturity level and documents the rationale

WG uses the outputs from previous steps to develop and prioritize options

WG develops plans to implement and evaluate the intervention(s)

## OUTPUTS

- Validated the information in DHPMAT and supplemented missing information
- Discussed, adjusted and confirmed the maturity levels identified in the DHPMAT
- The analysis and rationale have been documented, through which the strengths, challenges/opportunity are summarized.
- Potential digital health interventions (at the national or sub-national level)
- Documented prioritization analysis of the interventions which should include considerations about 1. relevant sociocultural, economic and political factors; 2. mechanisms, opportunities and resources available; 3. complexity and complicatedness of the proposed digital health intervention; 4. funding approaches.
- Implementation plan for the digital health intervention(s)



# Building a National DHM Profile

DH foundations	ICT infrastructure	Digital health tools	Information sharing	Enablers of DH adoption
DHM level '20-21	1	1	1	1-2
Indicators of DHM	100% population has access to electricity; no 3G.	No unique national ID	No digital health-related enterprise architecture	National digital health strategy being developed
	No data on health-related supply chain	pharmacy and drug procurement IS; not integrated with EHR; CRVS is paper-based;	No data on data quality, interoperability frameworks or standards	Existing digital health governance with monitoring of system performance.
	Complete (80-100%) use of ICT for administration of patient registration and social health protection; national e-Government plans published.	100% of health facilities connected to the Internet; existing PIS and electronic drug procurement system.	Existing legal frameworks for data security and privacy	No data on digital health-related expenditure
	No existing submarine fibre-optic cable, plan for 1 cable; satellite Internet for all the atolls with use of hotspots.	No use of telemedicine; the radio is used for health promotion broadcasts, for example, regarding Covid-19 awareness and Facebook live.	No national cybercrime legislation, or other legal frameworks to regulate data exchange within and outside the health sector.	Training programs in place for digital health workforce
Quality Improvement, Measurement, Monitoring & Evaluation	<ul style="list-style-type: none"> <li>• National digital health monitoring and evaluation framework being drafted; System performance is monitored</li> <li>• Partial institutional system of data quality assurance, for plausibility</li> <li>• No data about a government plan to provide, support and maintain digital health infrastructure</li> <li>• No data on needs assessment of technological or workforce capacity for digital health</li> </ul>			

# Health priorities & context

DH foundations	ICT infrastructure	Digital health tools	Information sharing	Enablers of DH adoption
<b>Impact of COVID-19</b>				
<b>Integrated person-centred care</b>	No known infrastructure to support telemedicine	No known digital tools to support telehealth or virtual care	No data on HIE to enable care coordination	No regulations and/or training to support telehealth
<b>Health reporting and surveillance</b>	Syndromic surveillance in place	Case and contact outbreak investigation system in place	Use of ICD-10 coding for mortality surveillance	No regulations and/or training to support epidemic management
<b>Findings and challenges identified in the 2016 survey of HIS in the Pacific</b>				
<b>PICT HIS findings challenges (2016)</b>	No data on ICT infrastructure issues associated with geographic isolation	No non-institutionalised data; process challenges to CRVS assessment; notifiable diseases not accounted for; to identify HIS reporting indicators	STEPS survey	Lack of infrastructure for implementing HIS activities; existing funding for equipment and funding since past 3 years.
<b>Pacific Islands HIS focus areas (2016)</b>	No regional approach to ICT infrastructure, development and maintenance	No regional approach to core digital tools, HIS focal points and data quality	No regional approach to enterprise architecture, terminology and interoperability standards	No regional approach to governance & commitment; HIS policies, legislation; capacity-building.

# Planning DHM to support health priorities

Essential DH foundations	Example: A practical goal based on current DHM level	Example: Activities (resources) to achieve desired DHM level
ICT infrastructure, equity & affordability	(Current DHM level: <b>Basic-Controlled</b> ) e.g. A mobile phone network with stable 3G, equitable or affordable for all citizens.	Desired DHM level: <b>Standardised</b> <ul style="list-style-type: none"> <li>Identify evidence-based, reliable, cost-effective and sustainable options;</li> <li>Seek ICT infrastructure funding for standards-based mHealth infostructure.</li> </ul>
Essential digital tools	(Current DHM level: <b>Basic</b> ) e.g. Integrate EHR (MEDTECH) & pharmacy system	Desired DHM level: <b>Standardised</b> <ul style="list-style-type: none"> <li>Compliance to standards for digital health tools, including access;</li> <li>A national unique person (patient/clinician) and facility identifier system.</li> </ul>
Readiness for information sharing	(Current DHM level: <b>Basic</b> ) e.g. A common data model & terminology for EHR (MEDTECH) & CRVS	Desired DHM level: <b>Standardised</b> <ul style="list-style-type: none"> <li>Identify relevant national/international standards for data, data models, architecture, and data analytics;</li> <li>Establish data and information governance and stewardship structures.</li> </ul>
Enablers of adoption and trust	(Current DHM level: <b>Basic- Controlled</b> ) e.g. accredited DH competencies and training for workforce	Desired DHM level: <b>Standardised</b> <ul style="list-style-type: none"> <li>Pre- &amp; in-service training of workforce in digital health e.g. tools, e-learning;</li> <li>Digital literacy programs in schools, colleges and work places.</li> </ul>
QIMME	(Current DHM level: <b>Controlled</b> ) e.g. program logic for above projects made explicit to guide evaluation (RE-AIM, output & impact indicators).	Desired DHM level: <b>Standardised</b> <ul style="list-style-type: none"> <li>A QIMME program for digital health intervention across many centres, emphasizing measurable process, outputs and impact indicators along with realistic deliverables and milestones.</li> </ul>

# Breakout Groups

Group 1	Group 2	Group 3
French Polynesia	Cook Islands	Kiribati
Palau	Fiji	PNG
Tokelau	Marshall Islands	FSM
Northern Mariana Islands	Solomon	Tonga
New Caledonia	Vanuatu	Tuvalu
Nauru	Samoa	Wallis & Fortuna
Niue		

# National DH Roadmap: Group Exercise Prompts

- What are your **National Health Priorities**?
- What are the **Opportunities and Challenges** within your country context?
- Based on your country's **DH profile** (pre-meeting activity), what might be **SMART objectives for digital health development**?
  - Which **DH systems/tools** are required to achieve these? (e.g., CRVS, RHIS/DHIS, EHR...?)
  - What **infrastructure** do these systems/tools require? Connectivity? Power?
  - Which **standards, data models, enterprise/info. architectures** do these require?
  - What are the **workforce** requirements for these systems/tools? Accredited?
  - What **governance** structures are required? National Strategy? Policy / legislation?
  - How will progress/growth be **monitored & evaluated**?

**How can we help each other to set and achieve these?**

**SMART Targets: Specific, Measurable, Achievable, Relevant, and Time-bound.**

# Staging Digital Health Maturity: The Model

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<b><i>Enablers of adoption and trust</i></b>	<ul style="list-style-type: none"> <li>• No digital health regulations</li> <li>• No existing national strategy for DH or HIS</li> <li>• No training programs</li> <li>• No governance structures</li> </ul>	<ul style="list-style-type: none"> <li>• Privacy legislation present</li> <li>• National strategy for DH/HIS is drafted or in process</li> <li>• Ad-hoc training programs</li> <li>• Ad-hoc governance structures</li> </ul>	<ul style="list-style-type: none"> <li>• ICT legislation present</li> <li>• National DH strategy and with priorities endorsed and implemented</li> <li>• Accredited training programs</li> <li>• ICT committee within organisational management</li> </ul>
<b><i>QIMME</i></b>	<ul style="list-style-type: none"> <li>• Ad-hoc QIME arrangements if at all</li> </ul>	<ul style="list-style-type: none"> <li>• QIME incorporated but uncoordinated</li> </ul>	<ul style="list-style-type: none"> <li>• Coordinated QIME for Comparative Effectiveness Research (CER) by regions</li> </ul>

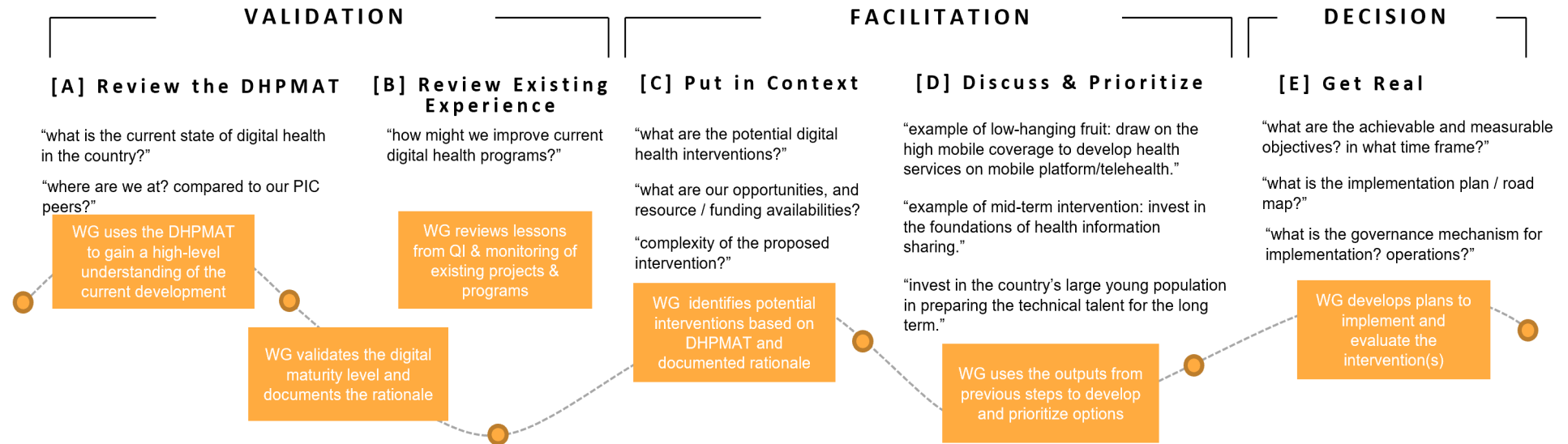
Questions?

# Activity Flowchart



## USER:

Country X (~100 K population) wants to improve the access to health services using digital health solutions/interventions. A working group (WG) has been formed to analyze the current state and develop a strategic direction and recommended way forward to the Ministry of Health. The WG suggests using the DHPMAT as an ongoing assessment and planning tool to facilitate its work.



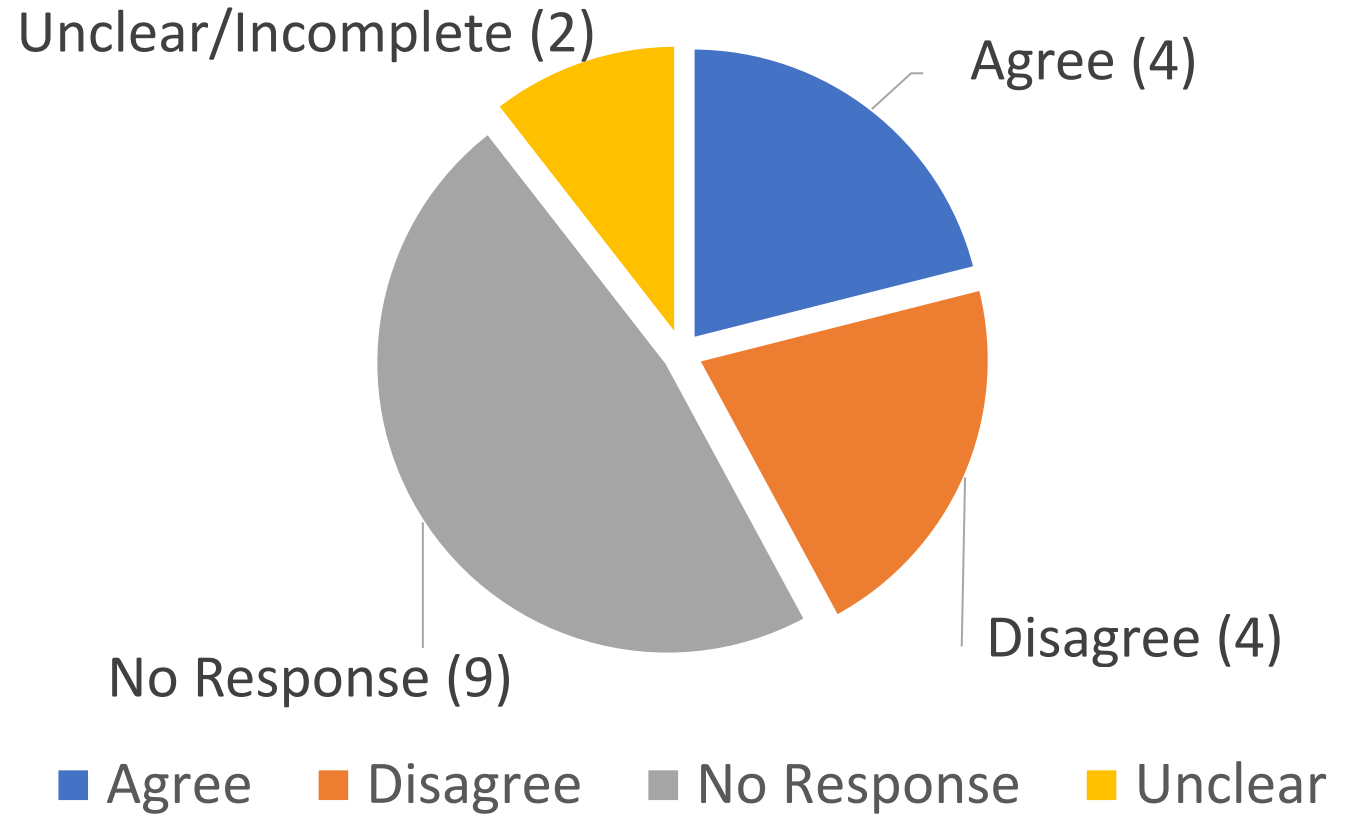
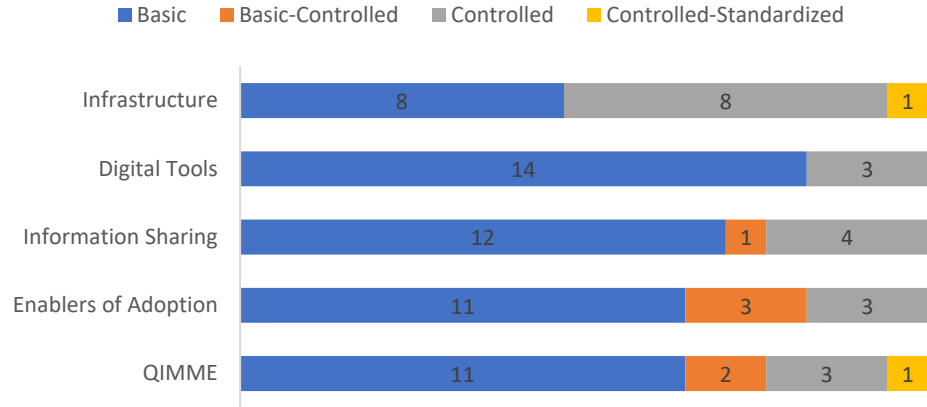
## OUTPUTS

- Validated the information in DHPMAT and supplemented missing information
- Discussed, adjusted and confirmed the maturity levels identified in the DHPMAT
- The analysis and rationale have been documented, through which the strengths, challenges/opportunity are summarized.
- Potential digital health interventions (at the national or sub-national level)
- Documented prioritization analysis of the interventions which should include considerations about 1. relevant sociocultural, economic and political factors; 2. mechanisms, opportunities and resources available; 3. complexity and complicatedness of the proposed digital health intervention; 4. funding approaches.
- Implementation plan for the digital health intervention(s)



Essential digital health foundations <sup>14</sup>	LEVEL 1 BASIC UNPREDICTABLE KNOWLEDGE & DATA NOT SHARED	LEVEL 2 CONTROLLED REACTIVE & PROBLEM DRIVEN KNOWLEDGE & DATA SILOS	LEVEL 3 STANDARDISED REQUEST DRIVEN KNOWLEDGE & DATA SHARING
<u>ICT &amp; IoMT infrastructure</u> e.g. penetration, affordability, reliability, ICT supply chain	<u>Examples:</u> Available but unaffordable and unreliable Internet & supply chain	<u>Examples:</u> Affordable & somewhat reliable Internet and supply chain	<u>Examples:</u> Support services and ICT hardware (supply chain) mostly accessible
<u>Essential tools</u> e.g. unique ID, social media, HIS/eHR/eMR, mHealth, teleHealth	<u>Examples:</u> Local ad hoc adoption & use of digital tools; Telephone = telehealth	<u>Examples:</u> Regional coordination of adoption & use of digital tools; Asynchronous info sharing	<u>Examples:</u> National benchmarks & standards for digital tools; Synchronous info sharing
<u>Readiness for information sharing</u> e.g. standards-based, interoperable, hardware, software & protocols to support security & privacy	<u>Examples:</u> Standalone datasets; No terminology standards	<u>Examples:</u> Ad-hoc sharing of datasets; Local terminology	<u>Examples:</u> Data sets integrated with HIS; National terminology
<u>Enablers of adoption</u> e.g. regulations, policy, strategy, governance, capacity building, funding	<u>Examples:</u> No digital health legislation; No training programs; No governance structures	<u>Examples:</u> Digital health privacy/security legislations; Ad-hoc training programs; Ad-hoc governance	<u>Examples:</u> Other digital health legislations; Accredited training programs; Relevant digital health committees
<u>Quality improvement, measurement, monitoring &amp; evaluation (QIMME)</u>	<u>Examples:</u> Local ad hoc QIMME activities	<u>Examples:</u> QIMME routinely embedded in digital health programs	<u>Examples:</u> QIMME coordinated for CER across programs and regions

### Collective Digital Health Maturity of PICs, by Foundation



# Staging Digital Health Maturity: the DHMM (1)

Digital Health Foundations	1. BASIC Unpredictable; uncoordinated; Knowledge not shared. GETTING CONTROL	2. CONTROLLED Coordinated but inconsistent; Knowledge silos. PROBLEM DRIVEN	3. STANDARDISED Performance consistent; Standards adopted; Organisation-level knowledge sharing REQUEST DRIVEN	4. OPTIMISED Efficient & accountable; Organisation-level collaboration SERVICE DRIVEN	5. INNOVATIVE New processes & innovations; Enterprise-wide collaboration. VALUE DRIVEN
<b>ICT infrastructure, equity &amp; affordability</b>	<ul style="list-style-type: none"> <li>• Unreliable Internet</li> <li>• Unreliable 3G, 4G</li> <li>• Very low percentage of the population have access to the Internet</li> <li>• &lt;10% broadband service subscriptions</li> <li>• Unreliable supply</li> </ul>	<ul style="list-style-type: none"> <li>• Internet, 2G, 3G, 4G somewhat reliable</li> <li>• c. 50% population have Internet access</li> <li>• c.50% broadband service subscriptions</li> <li>• Parts/services available in weeks</li> </ul>	<ul style="list-style-type: none"> <li>• Reliable Internet</li> <li>• Reliable 2G, 3G, 4G</li> <li>• &gt;50% population have Internet access</li> <li>• &gt;50% broadband service subscriptions</li> <li>• Parts/services available in-house</li> </ul>	<ul style="list-style-type: none"> <li>• All population have Internet access</li> <li>• All pop broadband service subscriptions</li> <li>• Reliable for critical apps for patient care</li> <li>• Parts/services with Quality Improvement</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> ICT infrastructure enable innovations</li> <li><input type="checkbox"/> Parts/services available</li> <li><input type="checkbox"/> Services innovating</li> </ul>
<b>Essential digital tools</b>	<ul style="list-style-type: none"> <li>• Non-unique Health ID system</li> <li>• Local procurement &amp; implementation of HIS/EHR</li> <li>• Use of social media</li> <li>• Telephone consultation</li> </ul>	<ul style="list-style-type: none"> <li>• Unique ID in Dept</li> <li>• Jurisdictional procurement &amp; implementation of HIS/EHR</li> <li>• Social media for information</li> <li>• Asynchronous files &amp; image sharing</li> </ul>	<ul style="list-style-type: none"> <li>• Unique ID in all of facility</li> <li>• National benchmarks &amp; standards for HIS/EHR</li> <li>• Social media for wellbeing apps</li> <li>• Synchronous video consult</li> </ul>	<ul style="list-style-type: none"> <li>• National unique ID</li> <li>• Data driven QI of HIS/EHR &amp; Data Quality assessment</li> <li>• Social media for personalised health information</li> <li>• Video consult + eHR</li> </ul>	<ul style="list-style-type: none"> <li>• Linked Data R&amp;D driving policy/practice</li> <li>• Ethical use of data \</li> <li>• Social media for personalised care</li> <li>• Video consult + Decision Support</li> </ul>

# Staging Digital Health Maturity: the DHMM (2)

Digital Health Foundations	1. BASIC GETTING CONTROL	2. CONTROLLED PROBLEM DRIVEN	3. STANDARDISED REQUEST DRIVEN	4. OPTIMISED SERVICE DRIVEN	5. INNOVATIVE VALUE DRIVEN
<b>Readiness for information sharing</b>	<ul style="list-style-type: none"> <li>Ad-hoc sharing of patient registry data with HIS/eHR or CRVS</li> <li>No terminology standards</li> </ul>	<ul style="list-style-type: none"> <li>Patient info shared routinely but not integrated with HIS/her</li> <li>Ad-hoc terminology standards</li> </ul>	<ul style="list-style-type: none"> <li>Patient info integrated in HIS/eHR and shared in facility</li> <li>National standard terminology recommended</li> </ul>	<ul style="list-style-type: none"> <li>Patient info integrated and shared with other facilities</li> <li>National standard terminology embedded</li> </ul>	<ul style="list-style-type: none"> <li>National standard data asset driving policy &amp; practice</li> <li>National Common Data Model</li> </ul>
<b>Enablers of adoption and trust</b>	<ul style="list-style-type: none"> <li>No digital health regulations</li> <li>No existing national strategy for DH or HIS</li> <li>No training programs</li> <li>No governance structures</li> </ul>	<ul style="list-style-type: none"> <li>Privacy legislation present</li> <li>National strategy for DH/HIS is drafted or in process</li> <li>Ad-hoc training programs</li> <li>Ad-hoc governance structures</li> </ul>	<ul style="list-style-type: none"> <li>ICT legislation present</li> <li>National DH strategy and/or plan(s) with identified priorities is endorsed and implemented</li> <li>Accredited training programs</li> <li>ICT committee within organisational management</li> </ul>	<ul style="list-style-type: none"> <li>Big data &amp; AI legislation</li> <li>National DH monitoring &amp; evaluation framework present</li> <li>National multi-professional training programs</li> <li>National digital health agency</li> </ul>	<ul style="list-style-type: none"> <li>AI legislation present</li> <li>Exporting training programs</li> <li>Digital health ministry</li> </ul>
<b>QIMME</b>	<ul style="list-style-type: none"> <li>Ad-hoc QIME arrangements if at all</li> </ul>	<ul style="list-style-type: none"> <li>QIME incorporated but uncoordinated</li> </ul>	<ul style="list-style-type: none"> <li>Coordinated QIME for Comparative Effectiveness Research (CER) by regions</li> </ul>	<ul style="list-style-type: none"> <li>Digital Health program scaled up &amp; normalised with CER ongoing nationally</li> </ul>	<ul style="list-style-type: none"> <li>Innovating digital health programs,</li> <li>QIME of new models of care</li> </ul>