

# Digital health and Universal Health Coverage: Opportunities and policy considerations for low- and middle-income Pacific Island countries and territories

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## Abstract

**Introduction:** Providing affordable, accessible, quality health services is critical to attaining Universal Health Coverage (UHC). Despite this, progress in many Pacific Island countries and territories could be faster. Digital health is an advancement in information communication technology that is anticipated to change health care delivery.

**Methods:** A systematic review of the literature and 5-years of Pacific Heads of Health, Pacific Health Ministers, and WHO's (Western Pacific) Regional Committee meeting reports was conducted. In addition, an umbrella review of the literature pertaining to digital health's use to address health systems challenges in low-and middle-income countries was undertaken and key-informant interviews with policymakers, digital health managers, technical advisors, development specialists, and donors were held. Data was thematically analysed using an inductive approach. Finally, a series of consultations were held with Pacific Health Information Network members to test findings and refine recommendations.

**Results/Discussion:** Four broad UHC-related challenges and associated priority digital health responses were identified. The challenges identified were a need to: (i) build systems for the collection and timely exchange of health data to support clinical management and health system planning; (ii) address barriers to accessing quality health care services (particularly in rural areas);

(iii) improve mechanisms for communication between health staff and functions of the health system, and (iv) address workforce training and essential skills development. Priority digital health responses identified include electronic health and patient information systems, telehealth, digital stock and supply chain management systems, technology-supported collection and linkage of population data, digitally enabled health worker-to health-worker communication and digital clinical decision-making.

**Conclusion:** While digital health can enhance health system function through accelerated access to and exchange of information, it does not replace fundamental health systems components such as a sufficient skilled health workforce, supply chains, health reporting, financing, or governance. Where adopted appropriately, digital health offers opportunities to improve the efficiency and effectiveness of established health enterprises and improve access to equitable and quality health care.

**Keywords:** Digital health; eHealth; Universal Health Coverage; low-and middle-income countries; Pacific Islands

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## Introduction

The provision of affordable, accessible and quality health services is recognised as critical to the attainment of Universal Health Coverage (UHC) (World Health Organization, 2021). Progress in achieving UHC has been slow in many Pacific island developing states, hindered by workforce shortages, geographic inaccessibility, poor infrastructure, geopolitical, economic, and environmental crises, and governance challenges (Craig et al., 2016; Wilson et al., 2021; World Health Organization, 2016). Digital health is an advancement in information communication technology (ICT) that is anticipated to change the face of health care. Digital health is a broad term used to describe the use of ICT, in all its forms, to support and enhance the provision of health service delivery (World Health Organization, 2019). The unanimous approval by the WHO Member States of the 'Resolution on Digital Health' at the 2018 World Health Assembly demonstrates the global commitment to explore the use of digital technology as part of health care delivery (World Health Organization, 2018b).

The Pacific island countries and territories (PICTs) constitute 19 of the 52 United Nations-classified Small Island Developing States (UNESCO, 2022). Across the PICTs, various digital initiatives have been implemented to support health functions. Examples include digital health worker-to-health worker communication for clinical decisions in Solomon Islands, use of satellite communication networks to transfer data between remote health facilities in Tuvalu, and two-way mobile near real-time data exchange in Papua New Guinea (Borgelt et al., 2022; Craig et al., 2022a; Rosewell et al., 2021). Despite these encouraging examples, many well intentioned digital health interventions in PICTs have failed, often due to a misalignment between system design and contextual realities.

In the PICTs, achieving health-service delivery goals is "so resource-sensitive that any technological intervention must clearly add considerable value to justify the allocation of resources that would otherwise be spent on staff, medicines, equipment and facilities" (Cullen & Hassall, 2017, p.305). Given this, strategy in policy decision-making about the use of digital health must use prudence.

In this article we report on research conducted to inform the development of an Asia Pacific Observatory on Health Systems and Policies (APO) Policy Brief. The Policy Brief is titled *Digital health and universal health coverage: opportunities and policy considerations for Pacific Island health authorities* (Craig et al., 2022b).

## **Method**

The aims of our research are as follows: 1) To identify Pacific health leaders' challenges in implementing digital technology and how this is supported; 2) provide guidance for the adoption of digital health interventions; and 3) recommend clear guidance to support the use of digital health and how to direct the resources in a more profitable direction. Data collection was conducted in four steps. Step one: A systematic review of the literature and 5-years (2015-2020) of Pacific Heads of Health, Pacific Health Ministers, and the WHO (Western Pacific) Regional Committee Meetings reports was conducted; data related to leaders' UHC-related challenges, priorities and responses were extracted. The results of this review are published elsewhere (Craig et al., 2022a). Step two: A review of literature that critiques digital health's use in addressing health systems challenges in low-and middle-income countries (LMICs) was conducted. Step three: Key-informant interviews with policymakers, digital health managers, technical advisors, development specialists, and international aid agency staff were completed. And finally, step four involved iterative consultation with senior members of the Pacific Health Information Network<sup>1</sup> during the analysis to ensure results resonated with lived experience and that the recommendations being generated were practical and implementable in the Pacific Islands context. The data collected were analysed using an inductive approach that involved iterative coding and grouping of emergent themes. Given the nature of the research, ethical clearance was not sought.

## **Results/Discussion**

### ***Priority health system challenges and digital health responses***



Our analysis found four broad UHC-related challenges. These were a need to: (i) build systems for the collection and timely exchange of health data to support clinical patient management and health system planning; (ii) address barriers to accessing quality health care services, particularly for communities in rural and remote locations; (iii) improve mechanisms for communication between health staff and functions of the health system to support information exchange and clinical decision-making; and (iv) address workforce training needs and skills deficits (Craig et al., 2022). Specific health



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<sup>1</sup> The Pacific Health Information Network is a regional group made up of health information officers from PICs and their development partners. The group's mission is to promote the use of information and technology to accelerate UHC (Pacific Community (2022)).

system challenges were identified within each challenge group, summarised in Table 1.

**Table 1. Important UHC-related health system challenges identified by Pacific leaders and priority digital health response interventions.**

<b>Important UHC-related challenges identified by Pacific leaders</b>	<b>Health system challenges*</b>	<b>Priority digital health responses</b>
 Building systems for the collection and exchange of health data	<ul style="list-style-type: none"> <li>• Lack of quality/reliable data; lack of access to information or data; and lack of unique identifier</li> <li>• Communication roadblocks</li> <li>• Insufficient continuity of care</li> <li>• Loss to follow-up</li> <li>• Poor planning and coordination</li> <li>• High cost of manual processes</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic health information management system/s</li> <li>• Electronic medical records system/s</li> <li>• Unique identification system/s</li> <li>• Digital linkage of health data with CRVS systems</li> </ul>
 Addressing barriers to accessing quality health care	<ul style="list-style-type: none"> <li>• Geographic inaccessibility</li> <li>• Insufficient supply of commodities, services and qualified health workers</li> <li>• Insufficient continuity of care</li> <li>• Delayed provision of care</li> <li>• High cost of manual processes</li> </ul>	<ul style="list-style-type: none"> <li>• Provider-to-provider telehealth</li> <li>• Digital stock and supply chain management</li> <li>• Technology-supported collection of demographic data required for planning</li> </ul>

 Improving mechanisms for communication between facilities and the functions of the health system Providing staff supervision and clinical decision-making support	<ul style="list-style-type: none"> <li>• Inadequate supportive supervision</li> <li>• Lack of or inappropriate referrals</li> <li>• Poor planning and coordination</li> <li>• High cost of manual processes</li> <li>• Poor accountability between the levels of the health sector</li> <li>• Inadequate understanding of beneficiary populations</li> </ul>	<ul style="list-style-type: none"> <li>• Provider-to-provider telehealth</li> <li>• Digitally enabled health worker-to-health worker communication</li> <li>• Clinical decision support systems</li> </ul>
 Addressing health workforce training needs	<ul style="list-style-type: none"> <li>• Insufficient health worker competence</li> <li>• Low health worker motivation</li> <li>• High cost of manual processes</li> </ul>	<ul style="list-style-type: none"> <li>• e-learning platforms</li> </ul>

CRVS = civil registration and vital statistics; UHC = universal health coverage

\* As per the taxonomy used in the World Health Organization's *Classification of digital health intervention v1.0*. (World Health Organization, 2018a)

***Priority digital health responses to health system challenges identified by Pacific leaders***

*For all countries*

In settings where the system architecture (i.e., the human and physical resources, the ICT infrastructure, the laws, regulations and standards, and the organisation and governance arrangements) required for the adoption of digital health are compromised (as is the case in several of the Pacific islands) (Liaw et al., 2021), prudence in the selection and implementation of digital interventions is critical.

For successful implementation of digital health, health authorities in all settings should develop a digital health strategy that articulates governments' data-informed decision-making ambitions, and identifies timelines and priorities for advancing the infrastructure, policies, workforce skills and broader systems needed to support digital health implementation. Further, they should assess the need for and capacity to deliver digital tools to address priority issues in primary health care delivery and the achievement of UHC and take steps to build the human and institutional capacity and physical infrastructure required to support digital health. This may include establishing mechanisms for digital health governance, creating new staff positions for managing and implementing digital initiatives, supporting skills development in ICT, and putting in place mechanisms to support the adoption of new technology.

Countries should also develop mechanisms to engage stakeholders from other ministries and the private sector and work with them to address the system-wide challenges to sustainable and scalable use of digital health; develop administrative instruments (i.e., the legislation, policies and procedures) that ensure digitised health data is secure and used appropriately; and monitor and evaluate digital health implementation and its impact on health system function and share findings within and across countries.

*For countries at an early stage of digital health maturity*

In addition to the general recommendations (above), countries at an early stage of digital health maturity should build domestic political support for digital health by collecting and presenting evidence for the likely impact of digital health on health care access, quality, equity and budgets. They should also secure the financial and technical support required to implement a national digital health strategy; assess the coverage of essential ICT services (e.g., electric power, Internet, and mobile cellular coverage); and establish country-led governance structures to guide the prudent use of digital health.

In terms of digital health interventions, priorities for countries at this stage of digital maturity are to establish (or, if in place, improve) an electronic health information management system that supports the ongoing collection, secure transfer and storage, and analysis of digitised health data; establish (or, if in place, improve) processes for digitising new and existing collections of health data; plan for the introduction of a unique patient/provider/facility identification system; and seek opportunities to introduce facility-level electronic medical records.

*For countries with foundational digital health infrastructure in place*

Countries with foundational digital health infrastructure should focus on establishing a workforce that enables the integration of digital health as a

routine part of health service delivery. This will involve the creation of digital health-specific roles within the public service and targeted skills development. Further, countries should conduct a gap analysis of the legal and administrative instruments (i.e., laws, standards, policies and procedures) required for data security and appropriate data storage and use and take action to address identified gaps, where required. Health leaders must be pragmatic when making decisions about what (and how) digital health interventions are adopted and ensure that investments made can be sustained. To maximise the likelihood of success, countries must focus on enhancing their digital health architecture, including the infrastructure, staff, legislation and standards, that will underpin sustainability and scalability.

In terms of interventions, countries with foundational digital health infrastructure in place should focus on high-impact interventions such as establishing unique identification systems, developing electronic medical record systems, digitising stock and supply chain management, delivering telehealth-supported care and exploring e-learning opportunities. More detail about the role these interventions may play and how they may be operationalised is available in the APO Policy Brief on which this article is based (Craig et al., 2022b).

#### *The role of development agencies and the corporate communications sector*

Development assistance provides an important means to realise the potential of digital health and offsets potentially prohibitive economic costs. Beyond financial support, assistance agencies have a role in advocating and guidance to enhance country ownership and leadership of digital health initiatives and ensure alignment across regional health, social and infrastructure development agendas.

Inevitably, health planners undertaking digital health development must work with the public and private telecommunication sectors. Telecommunication companies have a role in ensuring that the ICT infrastructure on which digital health relies is in place, both in urban and rural areas. Where appropriate, telecommunication providers may be engaged in designing digital health futures. Public and private partnerships for digital health should be considered.

Developing digital solutions is complex, and hence a one-size-fits-all approach is inappropriate. Tailored solutions that balance need, opportunity and domestic capacity to deliver digital solutions championed by national leadership are required. While development partners play an important role in supporting digital health innovation, they often lack the expertise, perspective and independence needed to provide comprehensive and balanced advice. Countries may see value in engaging systems architects to support



digital system design. PICTs may learn from context-comparable examples of success, such as the use of ICT to enable healthcare worker-to-healthcare worker communication in Tuvalu (Borgelt et al., 2022) and mobile health for enhanced data capture and exchange in Papua New Guinea (Rosewell et al., 2021).

Regardless of their stage of digital health maturity, countries and their partners should create environments that support the use of ICT to deliver equitable and integrated person-centred health care.

## **Conclusion**

While digital health interventions can enhance health system function through accelerated access to and exchange of information, they do not replace fundamental health system components such as health workforce, supply chains, health reporting, financing or governance (Birken et al., 2017; Greenhalgh et al., 2017; World Health Organization, 2010). Where adopted appropriately, digital health offers opportunities to improve the efficiency and effectiveness of established health enterprises, including improved access, equity and quality of health care.

## **Competing interests**

None to declare.

## **Ethical approval**

Not relevant.

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