

Access to ICT in the Pacific Islands region: a brief report

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Mobile technologies are an essential component necessary for the functioning of contemporary health systems.^{1,2} The advent of digital health represents a logical collaboration between the need for greater efficiencies in health service delivery and systems and the rapid expansion of personal mobile devices.³ Worldwide mobile subscriptions are expected to reach 8.9bn, smartphone subscriptions 7.2bn and mobile broadband 8.3bn.⁴ For many countries, mobile subscriptions exceed population numbers; the Pacific Islands region is no different.⁴ Yet, Pacific Island countries and territories (PICTs) still experience patchy access to information and communication technologies (ICT),⁵ limiting progress in implementing digital health initiatives to improve health.¹

The Pacific Islands region with 22 remotely situated and low resourced countries and territories, face considerable public health challenges. The impacts of climatic change, increased burden non-communicable diseases and re-emerging infectious diseases and now COVID-19, are among the costliest challenges facing the region. Regional cooperation is a priority, as reflected in the Health Islands vision, and operationalised via commitment to the Pacific NCD Roadmap and MANA Dashboard (Monitoring Alliance for NCD Action) as well as mandatory reporting requirements such as international health regulations (2005).^{6, 7} The challenge ahead is how to bolster country capacity to take advantage of the developments in ICT for public health.

Digital health has potential to support quality health services, although the evidence of effect in low resourced settings has yet to be fully realised.⁸ The recent Draft Global Strategy on digital health 2020-2025 teases out the principles and strategic objectives for promoting the use of digital tools in global health. In the current COVID-19 world, digital support can provide a platform for system wide efficiencies in terms of promoting collaboration and data sharing, but has a key role in ensuring service

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delivery, which is central to the achievement of universal health coverage (UHC).⁹ Other benefits include remote data collection and surveillance^{1,10} connect health workers,¹²⁻¹⁴ or NCD risk reduction, for example mCessation¹⁵ or health lifestyle change.¹⁶ This brief report provides an update on the accessibility and affordability of mobile subscriptions to support the implementation of mHealth within health systems across the Pacific Islands region. The PICs region is recognized as being 'in an information and communications technology (ICT) revolution'. However, progress is enabled with the investment in government digital health capacity training, relevant digital health approaches, digital literacy and ICT infrastructure and reduced costs to consumers.¹⁷

Digital interventions, even the most basic (e.g. one-way SMS), rely upon consistent and reliable connectivity, skilled technical capabilities and capacity. ICT infrastructure is fundamental to ensuring that innovations reliant mobile connections are accessible, affordable and reliable. Evidence from the International Telecommunications Union (ITU) suggests that the Pacific region is unique in terms of access to telecommunications hardware.¹⁷ Two major considerations include submarine cabling

(required to connect the hundreds of remote islands) and the comprehensive switchover to digital (currently not available to all countries).^{4,17} Other challenges faced by the region include small market size, underdeveloped regulatory frameworks, access to international internet bandwidth human resource capabilities have, until recently, restrained developments in access to ICT in the region. Yet despite these challenges, there has been a building interest and potential for digital health to support regional public health goals.^{3,18}

Mobile subscribership within the PICTs assessed using the Groupe Speciale Mobile Association (GSMA) Intelligence database and the International Telecommunications Union data sources.⁴ GSMA, the global on-line resource of mobile operator data, analysis and forecasts; and ITU, the primary database of international telecommunications capacity and development intelligence databases were reviewed to extract the following information: Subscriber Identity Module (SIM) penetration, mobile broadband access, number of mobile subscriptions; proportion of population using the internet, fixed telephone subscriptions, country level ITU development and potential market (as measured by GSMA criteria).

Information on telecommunications use is often derived from operators, hence the use of subscription data as measure of access.¹⁹ This is acceptable, but a more precise method is to use SIM penetration, meaning the proportion of a household that has access to telecommunications. Mobile subscriptions can overestimate access to telecommunications as individuals can have more than one subscription, whereas others have none. Pre-paid mobile is also an indicator of lower resources or 'cost-conscious' users.²⁰

SIM penetration across the region is varied, with nine out of 21 PICTs reviewed with a SIM penetration $\geq 90\%$; six (29%) of which were $\geq 100\%$ (**Table 1**). Six PICTs (29%) had SIM penetration $< 50\%$ while the remaining PICTs (16, 76%) had penetration ranging from 63-73% inclusively (data was not available for the Pitcairn Islands). SIM penetration ranged from 12% (the lowest in the Marshall Islands) to 130% (the highest in Fiji).⁴ Prepay remains the most common means of paying for mobile with 10 out of the 21 countries reporting a level of 90% and above for mobile being prepay. Mobile subscriptions were the highest in Fiji (114.2/100,000) and the lowest in FSM (21.90/100,000) In respect to the number of mobile service providers, the majority of countries are restricted to one

telecommunications provider (11/52%), six (29%) had two providers, three (14%) had three and one (5%) had four providers⁴ (GSMA Intelligence, 2019). At the time of analysis, internet use was generally low, with many countries with less than 50% of the population accessing the internet. The highest proportion of internet users were in New Caledonia; the lowest was in PNG (11%) and Solomon Islands. (12%).

ICT capability across the Pacific region is expanding, with many countries experiencing improved access to mobile technology due to major infrastructure investment.^{21,22} Market deregulation in some countries has stimulated competition in the sector, offering more competitive mobile rates. Yet, progress towards a widespread access reliable and affordable ICT remains a significant challenge.¹² Other key elements necessary to underpin sustainable digital health interventions include appropriate long-term resourcing alongside keen commitment from governments to support digital literacy and adaption to digital systems to support health system strengthening.

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TABLE 1. Profile of PICTs mobile capabilities, subscribership and providers²¹

Country	SIM Penetration (%) (4)	Pre-paid (%) (4)	Mobile-Subscript (/100,000) (ITU, 2019)	Individuals using the internet (%) (ITU, 2019)	Number and name of operators
American Samoa	73	92	-	-	2 [ASTCA; BlueSky]
Cook Islands	33	84	-	-	1 [BlueSky]
Fiji	130	92	114.2	49.97	3 [Digicel, Telecom Fiji; Vodafone]
French Polynesia	102	61	101.7	72.76	2 [Vini; Vodafone]
Guam	108	89	-	80.51	4 [Docomo, GTA, iConnect, IT&E]
Kiribati	47	93	39.63	14.58	1 [ATHKL]
Marshall Islands	12	100	30.12	35.76	1 [NTA]
Federated States of Micronesia	22	100	21.90	-	1 [FMS Telecom]
Nauru	98	100	88.04	57.06	1 [Digicel]
New Caledonia	98	61	-	82.01	1 [OPT]
Niue	94	84	-	-	1 [Telecom Niue]
Northern Mariana Islands	64	86	-	-	3 [Docomo Pacific, iConnect, IT&E]
Palau	117	92	-	-	1 [PalauCel]
Papua New Guinea	31	76	48.70	11.21	2 [b-Mobile, Digicel]
Samoa	72	95	63.23	36.61	2[BlueSky, Digicel]
Solomon Islands	73	95	76.12	11.92	2 [b-Mobile, Our Telekom]
Tokelau	63	73		-	1 [Teletok]
Tonga	100	84	99.92	41.25	2 [Digicel, U-Call]
Tuvalu	31	83	71.48	49.32	1 [Tuvalu Telecom]
Vanuatu	116	95	82.54	25.72	3 [Digicel, Telecom Vanuatu, WanTok]
Wallis and Futuna	67	67	-	-	1 [Manuia]