7th Pacific Heads of Health (PHoH) Meeting: 3 to 5 April 2019, Nadi Fiji

Agenda Item 5.2 – Update on eHealth and Health Information Systems in the Pacific

Health information and communication technology (ICT) is transforming the way health care is delivered. Pacific Island Countries (PICs) are adopting the use of essential digital health (or eHealth[1]) tools such as electronic medical and health records (eMR/eHR), telemedicine and mHealth[2]. Progress has been made in eHealth in the form of national eHealth strategies, civil registration and vital statistics systems. However, standards and investment plans and roadmaps are needed, with all aligned with cross-sectoral approaches to civil registration and (national) health identifiers. Furthermore, the region is also challenged by the rapid pace of change in eHealth, limited internet connectivity, unreliable power sources and the lack of qualified ICT and health personnel.

Unique to this region are the institutions, programs and committed development partners. Coordination of investments by development partners and the use of regional mechanisms will be essential to sustain ongoing support for health information systems in the region.

[1] For the purpose of this document, the term "eHealth" will be used congruent with the term "digital health".
[2] The use of mobile and wireless technologies to support the achievement of health objectives (mHealth)

1. BACKGROUND

The World Health Organization (WHO) characterizes electronic health (eHealth) as the use of ICT for health. Using ICT to promote, support and strengthen the entire continuum of health care, eHealth is both multidisciplinary and innovative.

What makes developing ICT in the Pacific region transformative are the endless possibilities to address the region's demographic, geographic and economic barriers. Conversely, the complications of rapid ICT advancement, legal and regulatory issues (such as the digital divide[3]) present challenges to eHealth progress.

PICs are faced with the challenges of how to plan, adopt and sustain the use of eHealth to improve people's health and health services. Challenges for eHealth development, such as establishing unique identifiers, selecting appropriate tools or software and access to sustainable funding, can be more efficiently addressed at the regional level, and that if done properly, can include guidance and support from regional organisations and networks for capacity-constrained countries.

2. PROGRESS AND ACHIEVEMENTS

2.1 Health information systems and eHealth

PICs have taken many essential steps forward in strengthening health information systems. According to a 2016 regional assessment on health information in the Pacific, information reporting frequency and quality has improved in general. Study showed that several countries have established a minimum set of core indicators and are producing regular summary reports[4]. Moreover, PICs have endorsed a number of important regional health information initiatives such as the Healthy Island Monitoring Framework in 2017 and the most recent Regional Action Agenda resolution on eHealth in 2018.

To identify the current state of digitalization of health information systems in the Pacific, WHO, with the support of the Pacific Health Information Network (PHIN), commissioned a landscape analysis of electronic health information systems (HIS) in 2017[5]. This was complemented by additional expert analysis on eHealth conducted by the WHO regional office in Manila in 2018[6]. eHealth projects of various sizes and complexities have been implemented with some degree of success. Noteworthy implementations include the development of electronic health information

[3] The digital divide is a term that describes economic and social inequalities to access and use information and communication technologies (ICT). U.S. Department of Commerce, National Telecommunications and Information Administration (NTIA). (1995). *Falling through the net: A survey of the* have nots *in rural and urban America*. Retrieved from, http://www.ntia.doc.gov/ntiahome/fallingthru.html.

[4] Health Information Systems in the Pacific at a Glance 2016 http://www.wpro.who.int/southpacific/pic_meeting/2017/documents/12thphmm_session04_01_his_annex1_24aug.pdf

[5] Sparking Solutions: Regional Approaches to Increase Benefits of eHIS Adoption in the Pacific. Discussion Paper. March 2018. Gevity.

[6] Expert Consultation on e-Health for Integrated Service Delivery in the Western Pacific Region, Manila, Philippines, 5-6 March 2018 : meeting report. http://iris.wpro.who.int/handle/10665.1/14210

systems in the majority of the PICs[7], the employment of Geographical Information Systems (GIS) and other data sources to inform health centre planning in the Solomon Islands and the development of the District Health Information System (DHIS2) in Tonga, Solomon Islands and Vanuatu. Additionally, Samoa has piloted projects on mobile health (mHealth) for tobacco control. Stages of eHealth development continue to vary between PICs due to attributes unique to each country. Some eHealth interventions are still in planning and some have not progressed beyond the pilot phase.

Regional networks play an important role in guiding countries with the development of "good" eHealth strategies. In 2018, Pacific Health Information Network (PHIN) adopted a new three-year strategic and implementation plan focusing on eHealth (and more broadly, digital health) and guiding countries in the right direction, exploring regional synergies and providing support and follow-up at the country level. PHIN is currently supported by WHO and SPC and has been recognized during Heads of Health and Pacific Health Ministers meetings in the past. Further support, especially from other partners, is however highly welcomed.

2.2 Civil registration and vital statistics systems: the role of the health care system

Civil registration refers to the continuous, permanent, compulsory and universal recording of the occurrence and characteristics of vital events, in accordance with the legal requirements of a country. Civil registration serves two primary functions: to establish the legal identity of members of a population, and secondly to provide governments with a national source of vital statistics, including statistics on causes of death. Civil registration systems that issue unique identifiers provide a basis for the establishment of secure national identification (ID) systems. If national IDs are then linked for example to the patient record management system of the health sector, unique health IDs can be produced.

Civil registration systems are also sources of vital health-related statistics. This is especially important in the Pacific, where a many of events (birth and deaths) still occur at home and reporting processes do not necessitate reporting to the health care system. In the Pacific, birth and death registration completeness ranges from as low as 15% in some countries to as high as 90% registration coverage. Data sharing between civil registration and health departments is therefore critical in ensuring that the records of either database are complete and that the data can be used in deriving important health indicators.

Overall completeness of civil registration systems remains a critical challenge in most PICs. Considering the symbiotic relationship between health information and civil registration systems, it is recommended that countries establish an institutionalised data sharing arrangement between registry offices and health departments. Such a relationship could facilitate the completeness and quality of identification data and vital statistics.

[7] According to the landscape analysis, many types of electronic systems are being implemented across countries to collect data and generate information. Of the 22 PICS all but 4 countries have some form of electronic HIS. There was a wide range in eHIS systems and data collection strategies, ranging from Excel spreadsheets to more advanced systems such as PATIS+ in Fiji.

3. CHALLENGES

The following main challenges around eHealth in the Pacific have been identified:

EHealth strategies need to be strengthened. Many PICs still lack "good" eHealth policies and strategies with a clear understanding of the legal boundaries, regulatory frameworks and standards to support the national health system. Ideally, eHealth strategies should be embedded in the national health plans, or embedded in the government plans if they exist.

Key foundations for eHealth need to be strengthened. Key foundations include ICT infrastructure and information-sharing mechanisms. Essential ICT infrastructure includes reliable power supply, mobile signal coverage and internet availability. Cellular signal coverage is still limited in many areas of the Pacific and broadband access within countries is concentrated in urban areas. It should be noted that eHealth uptake in PICs is greatly influenced and dependent on the overall access to ICT infrastructure and key foundations.

More trained staff on ICT and eHealth is needed. One of the most challenging tasks in strengthening the HIS in the Pacific is to train, employ and retain staff with specialized training in how to develop information systems for the health sector. Qualified technical professionals, including medical, public health, health information and ICT staff are needed to carry out, support and maintain eHealth implementations and to create enabling eHealth policies and forward-looking eHealth plans. Networks like the PHIN can help build regional capacity, for example with the establishment of training and the creation of a pool of experts for the region.

Long-term planning for investments in HIS is needed. Investments into eHealth have not benefited all PICs equally. Greater donor coordination and longer-term regional strategic planning with countries sharing their needs transparently is much needed. PICs are encouraged to improve their cooperation, collaboration and sharing within their health ministries, across the health sector and amongst other sectors to reduce duplication of efforts and waste of scarce resources. For those PICs that rely heavily on external funding sources, it is important to note that the associated arrangements often do not consider ongoing operational costs to sustain eHealth implementations. This includes the need for ongoing training, support, maintenance and replacement of the ICT infrastructure, as well as enhancements of the eHealth application software required to meet changing business, data and reporting requirements. To date, interventions in eHealth have been opportunistic and subtly sensitive to external influences (e.g., funding availability, focus on specific proprietary solutions, availability of talent, etc.). Overall responses to these conditions will require taking a more holistic and forward-looking approach, ranging from developing a practical digital health strategy and road map to establishing investment schedules to properly fund implementation.

Data collection and reporting need to be useful for those that collect the data. The Pacific health information reporting and data use for decision making is primarily based on aggregate data, and not so much on disaggregate data that can be used at the facility level to improve patient care. Individual records are often collected on paper by nursing staff, already burdened with basic service delivery, and then collated as aggregate data by nurses or data entry staff either locally or remotely.

The focus on aggregate data collection does not allow much feedback or direct benefits for the reporting facility and its health workers - which means that the benefit of reporting at the clinician level (e.g., nurse, physician) is not clear to those that collect the data. Having data disaggregated to an individual level and tied ideally to unique identifiers would make it easier to get detailed information on the health of individuals. Some countries (such as Fiji, Vanuatu, Tonga, and the Cook Islands) are starting to undertake broader thinking around health information use by looking beyond aggregate data, more towards patient-level data and the use of health data for direct patient care. Access to disaggregated data will put countries on a better track to meeting the SDGs, and more importantly, will help local health planners and health workers provide better care for the people in their communities.

Stand-alone and fragmented systems need to be overcome. Health services delivery or surveillance cannot be supported with any degree of success if implemented in a piecemeal fashion based on data fragmentation. This is however still often the case in countries with paper-based or partly paper-based systems. As a result, hospital and clinical records are usually stand-alone information systems that cannot communicate records between or within facilities. Paper-based records have other limitations as well such as handwriting illegibility, access issues, storage costs and potential for loss or damage. This can occur as a result of human error, or natural disasters such as a fire or flood. Electronic patient records, if implemented correctly, are much better organized and accessible than paper charts allowing for faster retrieval of laboratory or x-ray results.

Fragmentation of health information in different partly overlapping systems run by different vertical health programs represent a problem for the effective use of health information. For example, existing information systems for surveillance and disease-specific programs do not always provide spatially and temporally specific data with sufficient information for case investigation and outbreak response. Investments in eHealth infrastructure (such as a shared patient registry) can facilitate the integration of other vertical disease programs into a wider national health information system and is much needed.

The development of unique identifiers (for health) is needed. The national patient identifier is the foundation for interoperability across the entire EHR system. Presently, most countries in the Pacific use multiple ID numbers within their health system. This means that implementers of HIS may use a variety of registries and record systems containing identifiers that are not necessarily unique[8].[9] Multiple IDs lead to inefficiencies along the continuum of care, including fragmented health records, as is currently observed in the region. *There is an urgency to establish one national ID for the health sector.*

In addition, there are several registration and identification systems outside the health sector that are contributing to establishing a person's identity such as birth registries and national identification systems and that, if appropriate, may be adopted for the health sector. All work being

[8] Unique identifiers may be allocated by national authorities, territory authorities, local government authorities, individual healthcare organisations (for example, the hospital record number) or by departments within an organisation (for example, the diagnostic service number).

[9] In many cases, hospital patient indexes, if they do exist, are fragmented and have not been maintained properly (such as having multiple IDs for the same patients in hospitals and across hospitals). Most often, multiple health IDs are not linked to a master patient index or national health client registry and are rarely used for data sharing outside their clinic or clinic network. For example, in the absence of a national standard for patient ID, FSM, Nauru, Guam, Kiribati use a unique patient ID for each hospital resulting in difficulties, if not impossibilities, in exchanging health data between facilities.

undertaken on national IDs, health IDs and CRVS is foundational to position the PICs to adopt a universal legal identifier for use in the health sector. There are also potential risks in the use of one unique identifier for all government services including health, requiring extra vigilance in safeguarding the privacy of personal data. This remains one of the most critical challenges facing ID systems if legal protections and technical and administrative controls are not in place. Each individual PIC will have to weigh the benefits and risks in deciding how to deal with this issue.

4. FUTURE DIRECTIONS

Future investments in eHealth can lead to transformational change for the entire health system. To increase eHealth adoption as a form of health intervention, organizational and behavioural barriers, along with policy reforms, must be addressed with engagement from all levels. Recommendations are in line with those proposed in the Regional Action Agenda on Harnessing eHealth for improved health service delivery in the Western Pacific.

4.1. Recommendations for governments

1. Continue to strengthen "good" national HIS and eHealth strategies in line with the country's health and broader national priorities.

2. Continue to build capacity for human resources for health information/eHealth and ensure key foundations and enablers for eHealth are in place, including unique health identifiers, ICT infrastructure and information-sharing mechanisms.

3. Continue strengthening the relationship between civil registration offices and the ministries of health and that routine data sharing arrangements and common and harmonized frameworks are established.

4. Support regional networks such as PPHSN, PHIN, BAG and continually encourage collaboration with the health sector and stakeholders from outside the health sector (e.g. academic institutions). It is recommended that Heads of Health appoint a PHIN Country Representative[10] to represent and champion eHealth in their country.

[10] All PHIN Country Representatives will have a chance to serve as PHIN Board Members under a 3-year term to govern PHIN on behalf of its members, strengthen alignment with the Heads of Health and the Pacific Health Ministers and execute the PHIN Strategy and Implementation Roadmap.

4.2 Recommendations for development partners

5. Work with the development partners' community and help advocate, raise awareness and support eHealth. Disseminate, as appropriate, best practices, lessons learned and successful examples of digital health implementation in the region through PHIN.

6. Strengthen regional cooperation and multi-sectoral collaboration for eHealth by outlining how development partners and national governments can work together to optimize eHealth and HIS investments to avoid fragmentation, duplication of efforts and investment gaps.

7. Provide technical assistance to PICs for eHealth, including sharing of eHealth knowledge products such as strategy formulation, assessment frameworks, investment metrics, information standards and best practices.

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