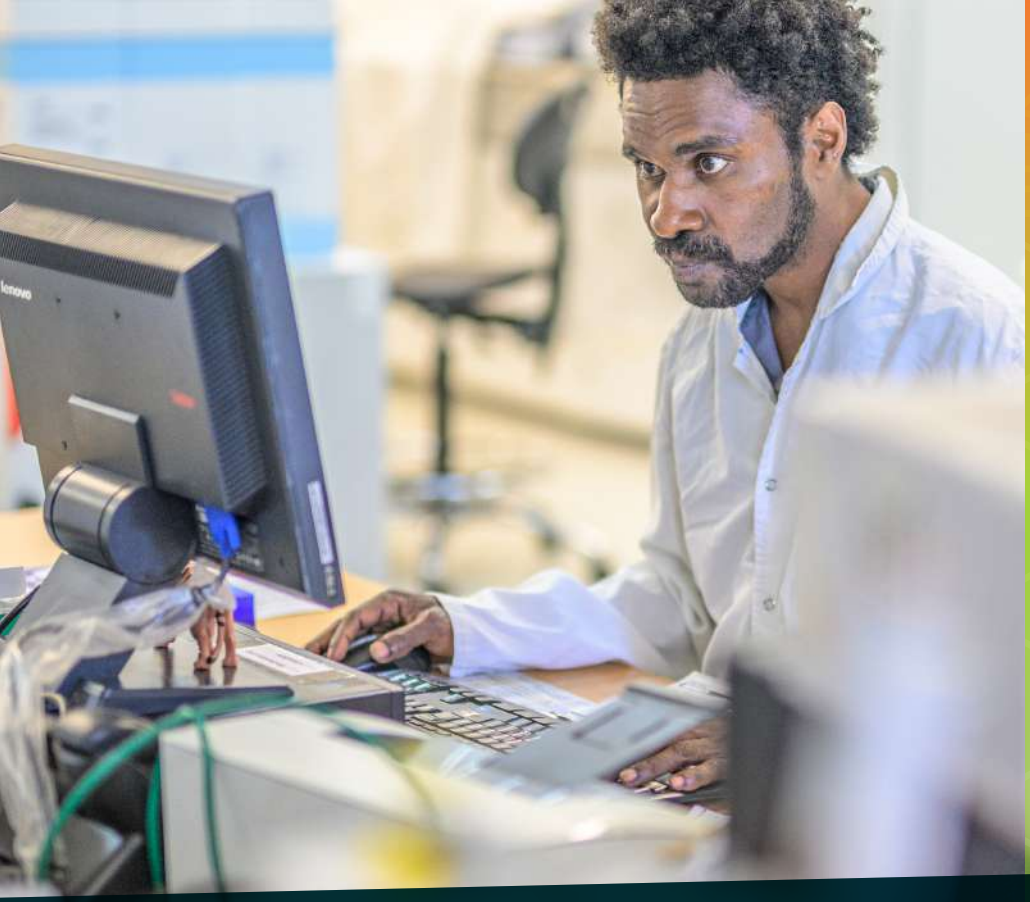

MINISTRY OF HEALTH
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Vanuatu

Vanuatu Digital Health Strategy 2025–2030

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Contents

Message from the Minister of Health	iv
Foreword	v
Acknowledgement	vi
Abbreviations and Acronyms	vii
Introduction	x
Executive Summary	xii
Part 1: Setting The Stage	**1**
Vision for Better Health Outcomes	2
Vision for Digital Health	7
Current Organizational Setup	7
Current Digital Health Architecture	9
Transforming While Performing: Keeping HIS and Digital Health Operational	11
SWOT Analysis	13
Drivers for Change	16
Part 2: Strategic Framework	**18**
Digital Health Strategy Framework	19
Guiding Principles	21

Part 3: Five (5) Pillars of the Digital Health Strategy **23**

Pillar 1: Strengthening Health Information 25

Pillar 2: Expanding Universal Health Coverage 29

Pillar 3: Improving Patient Continuity of Care 35

Pillar 4: Building Climate Resilient Health Systems 42

Pillar 5: Strengthening Foundational Health 46

Part 4: Sustainability Plan **59**

Part 5: Costed Implementation Roadmap **63**

Part 6: Monitoring and Evaluating the Digital Health Strategy **65**

Appendix A: Provisional Costed Implementation Roadmap 70

Appendix B: New Digital Health Unit Organizational Structure 76

Appendix C: RACI Between Ministry of Health and the Department of Communications and Digital Transformation 77

Message from the Minister of Health

Vanuatu is writing a bold new chapter for its health system—one that harnesses the power of technology to uplift every Ni-Vanuatu, no matter where they live. The *Vanuatu Digital Health Strategy 2025–2030* is more than a strategic document; it is our national commitment to equity, innovation, and resilience in the face of profound change.

As Minister of Health, I have seen firsthand both the challenges and the extraordinary potential of our people and health workers. Our nurses and doctors continue to serve with dedication in the most remote islands, often without basic infrastructure or digital tools. Yet, even in these difficult conditions, they persist—guided by their oath and driven by the belief that every person deserves quality healthcare.

This Strategy charts a bold yet practical course toward transformation. It brings life-saving services closer to our communities through telemedicine, strengthens how we collect, manage, and share patient information, and introduces artificial intelligence to support our clinicians in delivering faster, more informed care. It also prioritizes early warning systems to help us better anticipate and respond to disease outbreaks and natural disasters—making our health system more resilient and responsive to emerging threats. We will invest in our health workforce, improve our digital infrastructure, and build strong foundations to ensure that every step forward is inclusive, secure, and sustainable.

Importantly, the Strategy aligns with our national vision as set out in the People's Plan and the Health Sector Strategy. It reflects the values we hold dear: fairness, accessibility, partnership, and respect for community. By adopting the National ID as our National Health Number, integrating civil registration with our health systems, and embedding climate resilience into healthcare planning, we are strengthening the systems that hold our country together.

This Strategy is not driven by technology itself, but by what it can enable—better care, stronger systems, and improved outcomes. It is about making sure that a mother in Aniwa can get a diagnosis without leaving her island. That a nurse in Gaua can access patient records with the click of a button. That during the next cyclone, our health facilities stay connected, and no community is left behind.

This Strategy belongs to all of us. It is a collective effort shaped by our health workers, policymakers, provincial leaders, development partners, and communities. I extend my heartfelt thanks to everyone who contributed their time, wisdom, and passion to its development. A special thank you to the World Health Organization (WHO) for their technical guidance, which has helped transform this Strategy from an aspiration into an actionable and forward-looking national commitment.

Vanuatu is ready, not just to adopt digital health, but to lead with purpose and inspiration. Let us move forward together, knowing that a stronger, smarter, and more equitable health system is within our reach.

Hon. John Still Tari Qetu
Minister of Health, Republic of Vanuatu

Foreword

The *Vanuatu Digital Health Strategy 2025–2030* is not just a roadmap for transformation—it is a national commitment to modernize our healthcare system through the discipline of data and the power of technology.

As Director General of Health, I am proud to present this Strategy. It reflects a careful balancing act: to transform while continuing to serve; to innovate while remaining grounded in the realities of our health system; and to take bold steps forward without losing sight of what matters most—people.

Over the past decade, Vanuatu's health sector has made important gains in public health—strengthening disease surveillance, immunization, and maternal and child health. Now, having turned that corner, our focus over the next six years shifts toward strengthening clinical services. This Strategy lays the digital foundation to support that transition: from strengthening diagnostics and referral pathways to progressively improving access to timely and coordinated care.

Organized around five strategic pillars—**Strengthening Health Information, Achieving Universal Health Coverage, Improving Patient Continuity of Care and Services, Building Climate Resilient Health Systems, and Strengthening Foundational Health Infrastructure**. This Strategy is bold in vision yet grounded in action. Among its key priorities are the rollout of a national electronic health record system, the adoption of artificial intelligence to support both clinical decision-making and diagnostic processes, and the expansion of reliable connectivity to health centres and dispensaries across the country—ensuring that even the most remote communities are connected to care.

We know that success will depend not only on technology, but also on strong governance, sustainable financing, and a capable health workforce. Implementation will be phased and adaptive, supported by a separate *Costed Implementation Roadmap* to guide investments and development partner support.

I extend my sincere thanks to our health professionals, provincial teams, and stakeholders across sectors who helped shape this Strategy. I also wish to express my deep appreciation to the World Health Organization (WHO) for their steadfast technical support. Their partnership has helped us reimagine what is realistically possible.

Let us move forward together—with clarity of purpose, strength in partnership, and a shared belief that every Ni-Vanuatu deserves a health system that is not only modern and connected, but compassionate, resilient, and ready for the future.

REPUBLIC OF VANUATU
DIRECTOR GENERAL OF HEALTH
DIRECTEUR GENERAL DE LA SANTÉ
REPUBLIQUE DE VANUATU

Shirley Tokon
Director General of Health
Ministry of Health, Republic of Vanuatu

Acknowledgement

We gratefully acknowledge the leadership of the Ministry of Health and its partners in developing the *Vanuatu Digital Health Strategy 2025–2030*. This important document marks a significant milestone in the country's journey toward a more integrated, efficient, and equitable health system—one that embraces digital technology to strengthen and enhance healthcare delivery.

We commend the collaborative efforts of all stakeholders—government agencies, health professionals, development partners, and community representatives—whose insights and contributions have shaped a strategy that is both ambitious and firmly rooted in the needs of the people it serves.

The *Vanuatu Digital Health Strategy 2025–2030* presents a clear and forward-looking roadmap for leveraging digital tools and innovations to improve service delivery, strengthen data-driven decision-making, and expand access to quality healthcare across the country. It is well aligned with the Health Sector Strategy 2021–2030 and the National Sustainable Development Plan (NSDP).

We look forward to the continued commitment and support from all sectors—both government and non-government—in implementing this strategy and working together to build a healthier, digitally empowered Vanuatu.

Dr. Posikai Samuel Tapo
Director
Policy, Planning & Corporate Services
Ministry of Health, Republic of Vanuatu

Abbreviations and Acronyms

Acronym	Definition
ADB	Asian Development Bank
ADT	Admission, Discharge, and Transfer
AI	Artificial Intelligence
API	Application Programming Interface
AVI	Audio Visual Interleave
BI	Business Intelligence
COVID	Corona virus disease 2019
CRIM	Department of Civil Registry and Identity Management
CVD	Cardiovascular disease
DCDT	Department of Communications and Digital Transformation
DHSC	Digital Health Steering Committee
DICOM	Digital Imaging and Communications in Medicine
DMS	Document Management System
DHPMAT	Digital Health Profile and Maturity Assessment Toolkit
EHHSI	Environmental Health, Health Standards &Inspection Unit (MOH)
EHR	Electronic Health Record
EMMS	Environmental Management and Monitoring System
EWARS	Early Warning, Alert, and Response System
EWS	Early Warning System
FHIR	Fast Healthcare Interoperability Resources
FNU	Fiji National University
GBN	Government Broadband Network
HEMS	Health Emergency Management System
HIS	Health Information System
HSS	Health Sector Strategy
ICD	International Classification of Diseases
ICT	Information and Communication Technology
ID	Identification
IT	Information Technology
ITU	International Telecommunications Union

Acronym	Definition
IVR	Integrated Voice Response
JICA	Japan International Cooperation Agency
LEO	Low Earth Orbit Satellite
LOINC	Logical Observation, Identifiers, Names and Codes
MDR	Medical Disability Registry
MOA	Memorandum of Agreement
MOH	Ministry of Health
MOIA	Ministry of Internal Affairs
NCD	Non-Communicable Disease
NDMO	National Disaster Management Office
NEHR	National Electronic Health Record System
NEIR	National Electronic Immunization Registry
NHN	National Health Number
NLIS	National Laboratory Information System
NPH	Northern Provincial Hospital
NRIS	National Radiology Information System
NTD	Neglected Tropical Diseases
NUV	National University of Vanuatu
OAG	Office of the Attorney General
PACS	Picture Archiving and Communication System
PEN	Package of Essential Non-Communicable Diseases intervention
PHA	Provincial Health Administrator
PHIN	Pacific Health Information Network
PIS	Patient Information System
POC	Point of Care
POE	Preferred Operating Environment
PPP	Public Private Partnerships
PSC	Public Service Commission
RACI	Responsible, Accountable, Consulted, and Informed
RFP	Request for Proposal
SMS	Short Message Service
SNOMED CT	Systemized Nomenclature of Medicine Clinical Terms
SWOT	Strengths, Opportunities, Weaknesses, and Threats
TB	Tuberculosis
TCO	Total Cost of Ownership
TRBR	Telecommunications Radiocommunications and Broadcasting Regulator
UAV	Unmanned Aerial Vehicle
UHC	Universal Health Coverage

Acronym	Definition
UNICEF	United Nations Children's Fund
USA	United States of America
USP	University of South Pacific
VAHP	Vanuatu Australian Health Partnership
VCH	Vila Central Hospital
VCNE	Vanuatu College of Nursing Education
VDI	Vaccine-preventable Diseases and Immunization
VEMIS	Vanuatu Education Management Information System
VGMD	Vanuatu Meteorology and Geohazards Department
VIA	Visual Inspection with Acetic Acid
VIT	Vanuatu Institute of Technology
VNHREC	Vanuatu National Health Research and Ethics Committee
VSP	Vanuatu Skills Partnership Program
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organization

Introduction

In the heart of the Pacific, where the ocean serves both as highway and horizon, Vanuatu stands poised to navigate a transformative course in health service delivery—one steered by digital innovation. The *Vanuatu Digital Health Strategy 2025–2030* represents the nation's vaka moana, a double-hulled canoe designed to traverse not only calm waters but also the unpredictable tides of disease, disaster, and demographic change.

This Strategy acknowledges a fundamental challenge: existing health information systems are not evolving quickly enough to match national health goals. This challenge is further compounded by a chronic shortage of healthcare workers—an issue that is all too common in small island developing states across the Pacific.

Digital tools are not a luxury but a necessity; they can extend the reach of limited human resources, automate routine tasks, and ensure that scarce clinical time is focused where it matters most.

In such settings, digital tools are not a luxury but a necessity; they can extend the reach of limited human resources, automate routine tasks, and ensure that scarce clinical time is focused where it matters most. Paper-based systems still dominate, even as other sectors embrace rapid digitalization. Yet, Vanuatu has consistently demonstrated resilience and adaptability. Just as ancestral navigators once read the stars to discover new islands, the nation now turns to data, digital tools, and global standards to chart a modern journey toward universal health coverage and climate resilience.

Grounded in the *Health Sector Strategy 2021–2030* and aligned with the *WHO Global Digital Health Strategy*, this framework blends vision with pragmatism. It presents a pathway for enhancing health services by leveraging systems that are sustainable, interoperable, and contextually relevant. Above all, the Strategy emphasizes that digital transformation is not merely about deploying new technologies; it is about fostering a culture of innovation, good governance, and trust.

Importantly, the Strategy adopts a long-term perspective on technological change, particularly with artificial intelligence (AI). While there may be a tendency to overestimate AI's impact within the next three years, there is a parallel risk of underestimating its profound utility and power over the next seven. The document calls for deliberate and forward-thinking action to harness AI responsibly. As it asserts, the key to building a better future lies in using technology to achieve what was once considered impossible—not merely to digitize the past but to redefine what is possible.

Executive summary

The *Vanuatu Digital Health Strategy 2025–2030* is structured around five strategic pillars, supported by a comprehensive implementation and governance framework. It is both transformative and grounded designed to remain adaptive while maintaining focus on its strategic destination.

These five Pillars are operationalized through 23 Strategic Directions and further articulated across 84 Strategic Action Items. Each component serves as a deliberate step forward toward improved information, greater access, strengthened continuity of care, climate resilience, and a solid digital health foundation.

Part 1: Setting the Stage

This initial section outlines Vanuatu's national digital health vision, policy context, and current digital health ecosystem. It reviews lessons from the 2019–2021 Strategy, which achieved limited implementation due to fragmented systems and a lack of capacity. The SWOT analysis underscores systemic weaknesses, identifies emerging opportunities, and sets the rationale for a renewed, focused effort in digital health transformation.

Part 2: Strategic Framework

The Strategy is underpinned by 15 guiding principles, including architectural pragmatism, whole-of-life cost evaluation, interoperability, and the independence of choice. These principles ensure that digital health investments align with broader national development objectives and that they remain responsive to evolving needs.

The unchanged vision from the 2019 Strategy is now supported by stronger national ownership, improved governance structures, and clearer implementation pathways.

Part 3: The Digital Health Strategy

- **Pillar 1: Strengthening Health Information**

This pillar aims to institutionalize data governance, promote a culture of data use, and digitize existing archives. Initiatives such as a national intranet and management dashboards will enhance evidence-based decision-making.

- **Pillar 2: Expanding Universal Health Coverage**

To bridge the physical divide of the country, this pillar introduces digital solutions to expand access, including the integration of the National ID as the National Health Number, digital registration of vital events, and the scale up of telemedicine tools. Community outreach tools and public health promotion via mobile apps and SMS will ensure no one is left behind—even on the smallest islet.

- **Pillar 3: Improving Continuity of Care and Services**

Continuity is a lifeline for clinical care. This component focuses on establishing four integrated systems: the National Electronic Health Record (NEHR), Electronic Immunization Registry (NEIR), Laboratory Information System (NLIS), and Radiology Information System (NRIS), to ensure seamless care across all levels.

- **Pillar 4: Building Climate-Resilient Health Systems**

As climate events become more frequent, this pillar proposes the use of early warning systems for climate-sensitive diseases and introduces a digitized framework for disaster preparedness and environmental health monitoring.

- **Pillar 5: Strengthening Foundational Health Infrastructure**

Like the vaka's outrigger, this pillar provides the prescription and stability to keep everything upright. This final pillar emphasizes the urgent need to invest in human capital, digital governance, legal and regulatory frameworks, and robust IT and network infrastructure. It also prioritizes the adoption of interoperability standards and the responsible use of artificial intelligence.

Projected Costs

The full implementation of the Strategy is estimated to require more than one billion vatu (i.e. US$ 10M) over six years. Most of this funding is expected to come from development partners. The Strategy recognizes the need for flexible planning, with a flexible costed implementation roadmap that can adapt to new technologies, shifting funding landscapes, and emergent priorities. While this Strategy outlines phased investments and priority actions, the Costed Implementation Roadmap itself will be maintained as a separate living document—regularly reviewed and updated to reflect changes in context, opportunity, technology, and above all, funding availability.

High-priority investments—those deemed "no-regrets"—will be pursued immediately, while larger systems will be phased in as

funding becomes available. The Ministry will maintain close coordination with donors and ensure that all digital health investments are aligned with broader sectoral objectives.

Monitoring and Evaluation

The Strategy will be supported by a simple but robust monitoring and evaluation framework that tracks both quantitative and qualitative indicators. Alignment with the *Health Sector Strategy 2021–2030* ensures coherence, while the use of platforms like DHIS2 as the source of data facilitates efficient tracking. Annual progress reports and scheduled mid-term and end-line evaluations will support strategic course corrections.

The M&E approach goes beyond performance measurement, incorporating assessments of user adoption, system functionality, and data quality to evaluate overall effectiveness.

Summary of Sustainability Plan

Sustainability is addressed as a cross-cutting theme throughout the Strategy. Key elements include:

- Public-Private Partnerships: Collaborations with telecom providers and technology vendors to support connectivity and reduce operational costs.
- Workforce Development: Institutionalizing critical roles and reducing reliance on external consultants.
- Capacity Building: Embedding digital literacy training across all levels of the health sector.
- Resilient Infrastructure: Deploying off-the-shelf, low-maintenance, solar-ready solutions for remote facilities to power computing and digitalization.
- Revenue Models: Piloting shared community internet access from health facilities to offset connectivity costs.

These measures ensure that digital health becomes an integral, permanent part of the national health system—rather than a donor-driven initiative.

Conclusion

The *Vanuatu Digital Health Strategy 2025–2030* offers more than a roadmap—it is a national commitment to equity, resilience, and innovation for the people of Vanuatu. It challenges the country not only to digitize current practices, but to reimagine what healthcare can achieve through technology. In doing so, it sets a course toward a future where no patient is beyond reach, no island too remote, and no vision too ambitious.

Vanuatu is ready to lead digital health transformation in the Pacific—not just in adoption, but in inspiration.

Part

1

Setting the Stage

Vision for Better Health Outcomes

In 2018, the Ministry of Health developed the *Vanuatu Digital Health Strategy 2019–2021* to guide investments in digital health capabilities. With 105 strategic action items to implement, the key focus of the previous strategy was primarily on strengthening the health sector's clinical services.

In 2020, the World Health Collaborating Centre for eHealth[1], in collaboration with the Pacific Health Information Network (i.e., PHIN), completed a digital health profile and maturity assessment[2] of Vanuatu. From this assessment, the Digital Health Profile and Maturity Assessment Toolkit (DHPMAT) results for Vanuatu reveal that the country is currently assessed at a "Basic" to "Controlled" level of digital health maturity, which corresponds to Levels 1 and 2 out of a five-level model. This indicates that Vanuatu's digital health environment remains largely reactive, with uncoordinated processes and limited predictability or efficiency. For example, only 2% of health facilities had internet connectivity as of 2011, which reflects major gaps in ICT infrastructure and network reliability to this day—an essential foundation for digital health transformation. Compounding this is the limited human resource base, with only 4% of the population having attained tertiary education in 2009, posing challenges to capacity building and digital literacy in health.

Despite these limitations, there are emerging signs of progress and opportunity. Vanuatu has already developed two national digital health strategy prior the new Strategy and established a Digital Health Steering Committee, both of which lay the groundwork for more coordinated and strategic implementation. The country also has experience piloting telemedicine solutions and implementing various digital health systems like DHIS2 for public health reporting.

However, the DHPMAT notes that existing systems are fragmented, and there is limited readiness for interoperability and legislation to support cohesive data sharing across platforms. Additionally, while over 80% of the population has mobile cellular subscriptions, there is negligible broadband coverage, especially in rural and remote areas, further constraining digital health expansion. These results collectively highlight the urgent need to invest in foundational infrastructure (e.g., Internet), skilled workforce development, and interoperable digital systems to lift Vanuatu's digital health maturity to higher levels.

Furthermore, the DHPMAT assessment emphasized the fragmented organizational structure and governance of digital health within the Ministry of Health as a major barrier to progress. The lack of clearly defined roles and coordination mechanisms between the national and provincial levels, particularly between the Health Information System (HIS) and Information Technology (IT) units, has contributed to inefficiencies in digital system management and support. Additionally, the absence of a formal enterprise architecture has led to siloed systems with minimal integration across clinical, public health, and administrative domains. This fragmentation not only undermines the continuity of care but

1 Collaboration between WPRO and the University of New South Wales.

2 The Digital Health Profile and Maturity Assessment Toolkit (DHPMAT) was co-created by the World Health Organization (WHO) Collaborating Centre on eHealth (AUS-135) and WHO Western Pacific Regional Office (WPRO). The mission is to support the implementation of World Health Assembly Resolution WHA71.7 on Digital Health (2018), which urged Member States to: "… assess their use of digital technologies for health, including in health information systems at the national and subnational levels, in order to identify areas of improvement, and to prioritize, as appropriate, the development, evaluation, implementation, scale-up and greater utilization of digital technologies, as a means of promoting equitable, affordable and universal access to health for all, including the special needs of groups that are vulnerable in the context of digital health". For more information, see https://pmc.ncbi.nlm.nih.gov/articles/PMC7936524/

also prevents the use of data for real-time decision-making. The DHPMAT findings reinforce the urgency of the new Strategy's Pillars—particularly Pillar 1 (Strengthening Health Information) and Pillar 5 (Strengthening Foundational Health Infrastructure) —which call for unified governance, investments in core digital infrastructure, and the adoption of interoperability standards to enable a cohesive digital health ecosystem.

Since then, the MOH has undergone several leadership changes, including managerial positions in the HIS and IT units. In addition, the *Ministry of Health Clinical Services Plan 2019* and a new *Ministry of Health Corporate Plan 2022–2025* was published. The *Role Delineation Policy* was also released to describe, define, and to clearly delineate roles of various health facilities, including the essential service packages for primary care. The *Health Sector Strategy 2021–2030* was also refreshed in 2022, committing the health sector to a new era of delivering healthcare services up to the end of this decade.

This section describes the factors that will influence the new *Vanuatu Digital Health Strategy 2025–2030* (from now on referred to as "the Strategy") and ultimately the Strategy's Implementation Roadmap.

The five major influences shaping the new Digital Health Strategy are as follows:

1. National direction (i.e., *Vanuatu 2030: The People's Plan* and the *Health Sector Strategy 2021–2030*)
2. The need for improved health information
3. Technology direction and advancements
4. Learnings from past strategies, and
5. Current challenges

National Direction

Aligned with the *2030 People's Plan* and the *Health Sector Strategy (HSS) 2021–2030* this document is structured around several key goals and visions aimed at enhancing the country's healthcare system. The HSS's focal points are as follows:

1. **Expand Universal Health Coverage (UHC).** By focusing on ensuring everyone in Vanuatu, including vulnerable and marginalized groups, have access to equitable necessary health services without financial hardship. This is most effectively achieved through enhancing the availability and quality of primary health care across the country.
2. **Strengthening Health Systems Resilience.** By prioritizing the health system's ability to withstand health shocks such as disease outbreaks, natural disasters, and the impacts of climate change. This includes preparing for emergencies and maintaining essential services during crises.
3. **Improving Quality of Health Services.** By aiming to provide high-quality health services that are equitable and accessible. This includes reinforcing both public health and clinical service delivery systems to rebuild confidence in the country's health system.
4. **Promoting Healthy Lifestyles and Preventative Care.** By encouraging and facilitating healthy lifestyles and health-seeking behaviours to prevent diseases and improve well-being. This focus is on reducing the incidence of non-communicable diseases (NCDs) and enhancing mental health and psychosocial services.

5. **Developing Health Sector Management and Capacity.** By focusing on enhancing the management capacity and systems at all levels of the health sector, ensuring effective implementation of the HSS through improved governance, leadership, and accountability.
6. **Advancing Digital Health and Technology.** By upgrading health information systems for better data management (e.g., health information), decision-making (e.g., clinical and public health dashboards), and resource allocation (e.g., supply chain, human resource management).
7. **Fostering Collaboration and Partnerships.** By expanding partnerships and collaborative actions within and outside the health sector (e.g., the Department of Civil Registry and Identity Management or "CRIM"), to enhance resource sharing, innovation, and overall health outcomes.

These focus areas are designed to ensure comprehensive coverage and improvement of health care services, addressing both immediate and long-term health challenges facing Vanuatu.

Need for Health Information

A strong and effective health information system is the backbone of any modern healthcare system that provide the data necessary for informed decision-making, resource allocation, and policy development. In Vanuatu, despite significant progress in 2023 with the completion of a major technical upgrade to the DHIS2 public health system and the ongoing efforts to strengthen health information practices, the current state of health information continue to pose a significant bottleneck to achieving effective healthcare. The Ministry's ongoing reliance on paper-based systems hinder the collection, processing, and dissemination of critical health data. This inefficiency has resulted in delays in reporting, limited data accuracy, and ultimately the quality of healthcare services delivered across the country.

To strengthen the efficacy of Vanuatu's new Strategy, the Ministry must prioritize adequately resourcing the National and Provincial Health Information System (HIS) and Information Technology (IT) teams, consistently strengthen the reporting coverage across all provinces, improve the analytical capabilities at the workforce level, and further modernize its health information systems including increasing the use of DHIS2 as a public health tool.[3] Moving away from manual data collection and isolated systems towards an integrated, real-time digital solutions will significantly improve the timeliness, accuracy, and accessibility of health information.

However, the improvement of health information goes beyond mere digitization. It also requires building a culture of data-driven decision-making. Healthcare workers at all levels need to be trained not only to capture data but also to interpret it, ensuring that the information collected is used effectively to improve health outcomes. In this regard, the establishment of health information standards, data governance policies, and ongoing capacity building are key to ensuring the integrity and security of data. Strong data governance is particularly important as Vanuatu is committed to adopt digital solutions. This is also to ensure that patient privacy is respected while allowing health information to be shared where needed to optimize care.

Additionally, improved health information systems will provide the foundation for more advanced digital health solutions, such as artificial intelligence (AI) and predictive analytics, to be introduced. These technologies rely on vast amounts of high-quality in-context data to provide real-time insights into patient conditions and optimize the allocation of healthcare resources. By focusing on improving health information first as a core priority, Vanuatu can set the stage for more sophisticated, data-driven healthcare innovations that can transform the country's health system in the years to come.

The need to improve health information is about laying a sustainable foundation for a healthcare system that is data-driven,

3 Sometimes referred to as the Vanuatu Health Management Information System or VanHMIS.

responsive, and resilient. This will enable Ministry to deliver on the broader goals of universal health coverage, health system resilience, and improved service quality as outlined in the *Health Sector Strategy 2021–2030*.

Technology Direction

As the 21st century unfolds, Vanuatu is at the centre of the world's Fourth Industrial Revolution[4] – an era dominated by digital and information technologies. This revolution is reshaping traditional business models, including transforming how goods and services are delivered. Today, consumers enjoy (and expect) highly personalized, user-friendly, and seamless digital experiences. In healthcare, this evolution is particularly evident, as patients now expect richer and more impactful engagements with their medical providers, facilitated by advanced technologies that can bridge the digital divide in geographically constrained countries like Vanuatu.

Despite strides in technology that enable digital collection, processing, and dissemination of vast amounts of data, the Ministry is overwhelmed by outdated paper-based processes. These archaic methods create barriers and limits to data availability, detract from the efficiency of valuable human resources, and hinder the potential for improved healthcare outcomes. In addition, although still limited and tempered due to tight telecommunication regulatory controls, Vanuatu's options for network connectivity solutions have improved in the past five years allowing rural health facilities to participate in the digital interaction and exchange of health information.

It is evident, however, that the contrast between the promise of digital innovation and the reality of current practices underscores a critical gap in the adoption of new technological solutions in Vanuatu's healthcare sector.

The world has also seen how technology enabled healthcare services and economies during the COVID-19 pandemic. Although not new, technologies such as social media, mobile phones, artificial intelligence, cloud computing and wearable devices provided the healthcare industry with new ways to understand and interact with patients, families, and their caregivers. Every day, the healthcare sector welcomes new technologies and capabilities that dramatically reshape approaches to care and broaden the gateway for innovative, non-traditional entities (e.g., the surge of Zoom and other teleconference capabilities during COVID-19) to enter the healthcare space. Health systems now have the capacity to extend healthcare continuity into daily life, moving beyond the traditional confines of clinics and hospitals. These technological advancements equip health systems with essential tools to identify individuals at risk of disease, tailor the management of their health needs, and enhance the detection of communicable diseases across populations. In response to this rapid evolution, health systems are increasingly engaging in partnerships with innovative new players.

The introduction of new digital solutions is also fundamentally transforming healthcare delivery from traditional reactive methods to a more proactive, preventive approach. This shift is largely facilitated by enhanced consumer access to health promotions and their own health data empowering individuals to take charge of their health. For instance, in rural Vanuatu areas where healthcare access might be limited, mobile health applications can allow patients to monitor their chronic conditions, receive health tips on how to manage their diabetes, and even get reminders for medication adherence. This approach is exemplified in initiatives like the telehealth programs introduced during the COVID-19 pandemic, which enabled patients in remote locations to consult with healthcare providers without needing to travel.

Artificial intelligence (AI) can also play a crucial role in Vanuatu's new digital health strategy by automating routine tasks, improving data accuracy, and providing clinical decision support. These

4 The Fourth Industrial Revolution is a neologism describing rapid technological advancement in the 21st century. A part of this phase of industrial change is the joining of technologies like artificial intelligence, gene editing, to advanced robotics that blur the lines between the physical, digital, and biological worlds.

tools can streamline administrative processes, reduce errors, and free up scarce healthcare workers to focus on patient care. Additionally, AI-driven clinical decision support tools that combine trusted, evidence-based clinical content with conversational search powered by generative AI[5] can provide healthcare providers with real-time, accurate information to support diagnoses and treatment plans. This ensures timely, precise assessments even in settings without specialist support - a chronic challenge in Vanuatu. By tapping into AI technology, Vanuatu can ensure its health systems are not only digitized but also strengthened using technology innovation to fully deliver high-quality care possible.

Lastly, communities in Vanuatu are increasingly becoming active partners in clinical decision-making. For example, platforms that allow patients to interact digitally using telemedicine, or share real-time health data with their doctors can facilitate more tailored and timely medical advice, thus improving the outcomes of health interventions. This collaborative approach not only enhances individual health management but also contributes to the broader public health monitoring system by enabling early detection of communicable diseases and more effective community health management strategies.

Learnings from Past Strategies

A review of past digital health strategies and their outcomes helps craft more effective and sustainable digital and health information strategies. A review of the performance of the *Digital Health Strategy 2019–2021*, including other past strategies, showed prior direction setting to be heavily IT-centric, with little to no mention on how to improve health information, which is probably the most critical problem facing the Ministry today.

The previous strategy placed considerable focus on the clinical aspects of digital health, but there has not been a lot of progress. A review of the past strategy's performance showed that only 5% of its 105 action items to have been completed. In addition, and for the duration of this strategic period, the resource constrained National and Provincial HIS units were focused (and persistently overwhelmed) to improve the Ministry's public health system by the DHIS2 technical and functionality upgrade that took place from 2018 to 2023. It is important to note that the IT unit was not involved with this upgrade as this group was primarily focused on hardware and network break/ fix/ support with very little attention or capabilities in software support.

Although achievements are important in every strategy, it does not tell the entire picture. The COVID-19 pandemic has caused the health sector multi-faceted challenges ranging from healthcare workers facing unprecedented levels of stress and burnout, rolling out mass vaccination campaigns with significant logistical challenges, delayed diagnosis and treatment of non-essential medical services, financial and resource strains, uncertainties, and many others. From 2019 to 2021, Vanuatu also experienced at least six significant cyclones[6] during this period that have been disruptive to regular healthcare operations, with Cyclone Harold in 2020 being particularly devastating.

Ultimately, Vanuatu requires a digital health strategy that is both realistic and aligned with the sector's priorities, addressing critical challenges such as chronic staff shortages and limited delivery capacity. This Strategy must also account for the disruptive impacts of pandemics and natural disasters.

Current Challenges

The Ministry faces several challenges in being able to take advantage of innovation and progress made in digital health. Although every healthcare system in the world will always experience challenges, the challenges Vanuatu are facing are

5 Generative AI in healthcare refers to advanced artificial intelligence systems that create new and relevant content, such as medical text, images, or predictions, based on learned patterns from existing data. It is used to enhance clinical decision-making, automate documentation, and generate personalized treatment plans, contributing to improved efficiency and patient outcomes.

6 Cyclones Oma (2019), Gretel, Harold (2020), and Lucas, Ana, and Bina (2021)

exacerbated since foundational capabilities have not been addressed since the Ministry has gone digital. Without this foundation, architecting a future in digital health will be condemned. Leadership, people, and an enabling environment form one foundational asset. A stable, accessible, and reliable infrastructure form the other. Standards, policies, procedures especially centered around information management, are also identified as foundational assets that has a direct link in shaping future outcomes. The lack of progress in these three areas has limited the rate of progress in other areas.

Vision for Digital Health

Vision

The vision sets the overarching goal that the new Strategy aims to achieve. It acts as a beacon guiding all strategic decisions, technological implementations, and policy development related to digital health at MOH.

Based on the *Digital Health Strategy 2019–2021*, the vision for digital health is:

> *"To use sustainable, cost-effective technology, systems, and processes to ensure the right information is available to the right people at the right time, to support evidence-based decision-making for managerial, planning, and clinical decisions."*

The current vision remains valid and applicable. However, modifications will be needed to the guiding principles to encompass additional strategies and a plan of action for the next six years. These modifications start by first establishing the guiding principles to adopt, which in turn will shape the new Strategy.

Current Organizational Setup

The Ministry has two organization units delivering on the digital health needs of the country: Health Information System (HIS) and Information Technology (IT). Each working independently reporting to the Policy, Planning and Corporate Services directorate.

Health Information System (HIS)

The HIS unit is responsible for collecting, processing, analyzing and disseminating health information and actionable insights for use in health planning and decision making. It plays a crucial role in the efficient management and delivery of healthcare services in Vanuatu by providing the tools and digital health solutions to support clinical, public health, and administrative functions across the country's healthcare milieu. The HIS unit is also responsible for providing training to healthcare staff on how to analyze and use health information effectively. Since the HIS unit is the primary custodian of the Ministry's data, the unit is also responsible for implementing policies and technologies to protect patient data privacy and ensuring compliance with legal and regulatory requirements.

In essence, the HIS unit serves as the backbone of modern healthcare systems, ensuring that accurate, timely, and relevant information is available to support clinical care, administrative functions, public health initiatives, and policy development. By developing and protecting the health sector's information assets, its goal is to improve health outcomes, enhance the efficiency of healthcare services, and support the overall health system's resilience and adaptability.

Information Technology (IT)

The IT unit is responsible primarily for the infrastructure management, security, and maintenance of the Ministry's network and hardware. The IT unit does not manage development or maintain software, nor are they responsible for system integration and interoperability across various health and government systems. The IT unit is solely focused on hardware repairs, 1st level technical support, and user helpdesk services.

The IT unit play an essential role for maintaining the technological backbone of the health sector.

Staffing and Structure

The HIS and IT units are both independent units, with their own managers, reporting to the Director, Policy, Planning and Corporate Services division. Due to the way the healthcare system is structured in Vanuatu, each of the 6 provincial governments has its own health department servicing the needs of 72 area councils and communities in their respective provinces. Each provincial health authority also has its own provincial HIS and IT officers that reports to the Provincial Health Administrators (i.e., "PHA).

Unless the provincial HIS and IT officers are absorbed as full-time employees within the provincial government, they are typically on a one-year renewable contract. Unfortunately, the high number of vacancies and the inability to renew contracts on-time has severely hampered the delivery of health information and IT services at the provincial level. This translates to insufficient technical support and low reporting coverage, among others.

In any digital and health information setting, domain knowledge and technical expertise – both embodied in people – are critical, scarce resources. Therefore, human and organisational capacity must be seen as a foundation on which MOH must define, refine, and underline their success strategies.

The following table shows the current number of positions allocated for HIS and IT at the national and provincial health levels and the number of vacant positions. Note that there are no Hospital IT Officers to support doctors, nurses and other hospital workers. In other words, clinicians are on their own to support their own IT needs.

Positions	Established	Position Filled	Frozen Vacancy	Absolute Vacancy
National HIS	4	2	1	2
Provincial HIS	6	4	0	2
Hospital HIS	4	4	0	0
Hospital IT	0	0	0	0
Hospital Records Clerk	18	0	0	18
National IT	3	2	1	1
Provincial IT	6	1	0	5
Total	**41**	**13**	**2**	**28**

Over several years, there has been several vacancies that cannot be filled in both the HIS and IT units. Ultimately, the environment and foundation in which the proposed organization structure could be built and flourish in carrying out the previous strategy has not been created. If the issue regarding staff vacancy is not addressed immediately, it would be extremely difficult to deliver on commitments made in the new Strategy.

Technical capabilities

Beyond the support of desktops, hardware and networks at MOH, the technical capabilities to support the core digital needs of the health sector lie with the new Department of Communications and Digital Transformation (i.e. "DCDT" formerly known as Office of the Government Chief Information Office). The DCDT is the national government's IT organization responsible for formulating whole-of -government IT strategies, policies and standards. They also provision the computing environment of the Government of Vanuatu, including the government network and data centers where all government servers are housed. DCDT also has a small pool of computer programmers and systems administrators supporting the various digital systems across government.

As the portfolio of digital health applications grow, and the reliance on external consultants and service providers wane, the dependency on DCDT to support MOH's various digital health applications will become much more critical. Furthermore, with the introduction of Vanuatu's Data Protection Act in 2024, the need to rely on DCDT to maintain some of MOH's repatriated servers becomes even more crucial than ever.

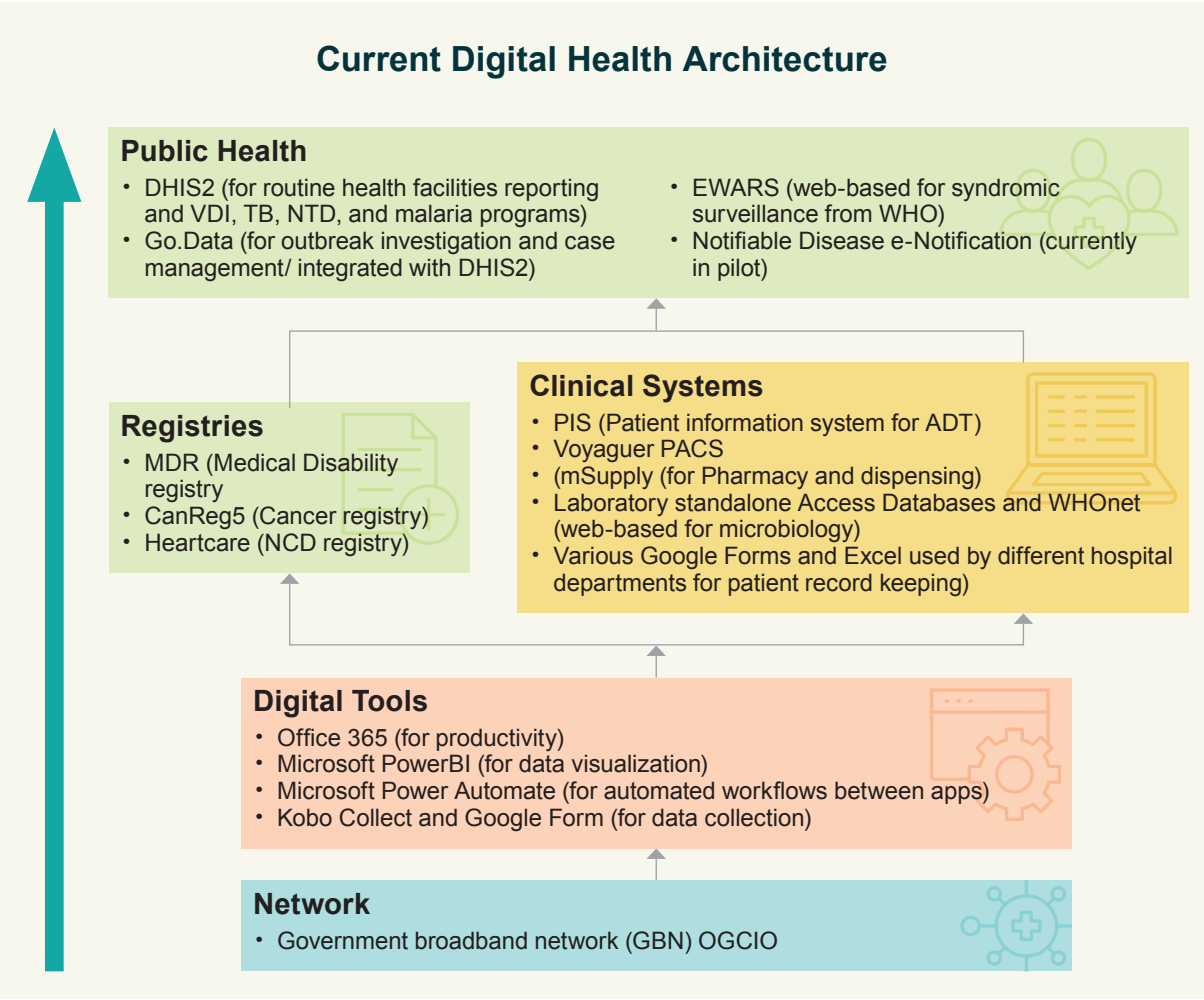
Current Digital Health Architecture

Vanuatu's current digital health architecture reflects a diverse and fragmented landscape of systems that have evolved to meet varying health program needs. The Ministry manages one of the most extensive and varied collections of digital applications in the country.

At the core of public health data management is DHIS2, which serves routine reporting functions for health facilities and vertical programs such as vaccine-preventable diseases and immunization (VDI), tuberculosis (TB), neglected tropical diseases (NTD), and malaria. Complementing this are outbreak investigation tools like Go.Data, which integrates with DHIS2, and EWARS, a WHO-supported system for syndromic surveillance. A Notifiable Disease e-Notification system is also under pilot to improve timely disease reporting.

The clinical care environment uses a range of disconnected systems. These include the highly bespoke and undocumented Patient Information System (PIS) for admissions, discharges, and transfers (ADT); Voyager PACS for imaging; mSupply for pharmaceutical supply; and fragmented laboratory systems such as Access databases and WHONet for microbiology. Many hospital departments still rely heavily on their own methods for patient recordkeeping using Google Forms and Excel, underscoring a lack of interoperability and consistent record keeping standards across facilities. These clinical systems operate in silos and are not linked to each other or to public health databases, limiting the potential for comprehensive patient tracking and service integration.

Vanuatu has also introduced registries to monitor non-communicable diseases (Heartcare), cancer (CanReg5), and people living with disabilities (MDR). While valuable, these systems are standalone and not yet fully integrated into the broader health information ecosystem. Digital tools commonly used such as Office 365, Power BI, Power Automate, Kobo Collect, and



Google Forms are being utilized to support productivity, visualization, automation, and data collection. However, their use is largely ad hoc and lacks an overarching digital governance framework to ensure coherence, quality assurance, and data security.

Interoperability remains a key challenge in Vanuatu's digital health landscape, as most systems currently operate in silos without standardized data exchange protocols. To address this, the adoption of international health data standards such as HL7 (Health Level Seven) FHIR (Fast Healthcare Interoperability Resources) is a commitment made under this Strategy on any solution acquisition or development.[7] These standards enable structured and consistent communication between disparate systems, allowing for more seamless integration across public health, clinical, and registry platforms. Implementing HL7 FHIR will facilitate patient data sharing, reduce duplication, and enhance clinical decision-making.

All Ministry of Health digital systems depend on the national Government Broadband Network (GBN) for connectivity, and on the Government Data Centre for hosting software applications. Both are managed by DCDT which provides the foundational infrastructure that underpins Vanuatu's digital health ecosystem – making this government agency a critical partner to deliver the health sector's digital agenda in the next 6 years.

7 For instance, the Medical Disability Registry (MDR) which is the latest application launched by MOH in 2024 was built with HL7 FHIR standards.

Transforming While Performing: Keeping HIS and Digital Health Operational

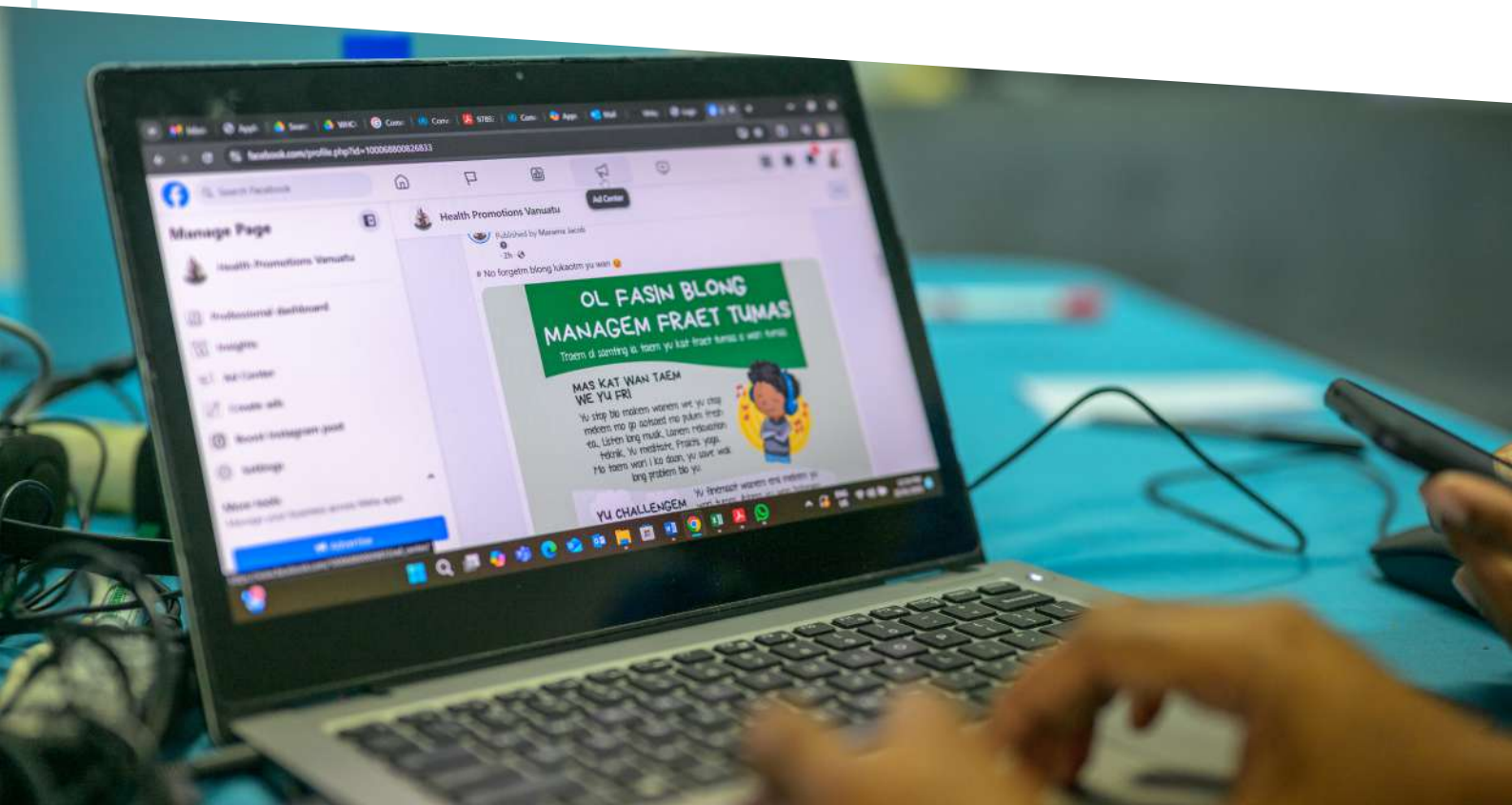
While this Strategy is forward-looking, the Ministry must also ensure the reliable and sustainable continuity of its core operations and the ongoing support of existing digital systems. This includes implementing essential, non-discretionary enhancements to maintain system efficiency and alignment with the evolving needs of health services and programs. In other words, as the Ministry drives digital transformation through this Strategy, it must also ensure uninterrupted critical healthcare functions and the seamless operation of current digital services—effectively 'keeping the lights on'.

Since nearly all IT operations are handled through intergovernmental IT support with the DCDT, the Ministry will strive for operational excellence by first mastering the basics together with DCDT to balance stability with innovation. The roles and responsibilities between the Ministry and DCDT are provided in a RACI chart on Appendix C.

From 2025–2030, the Ministry, with the support of DCDT, will continue to make operational improvements in the following areas:

Area for Improvement	Recommendations
1. Timely survey and assessment submission	• Update and expand routine data collection and current core indicators to reflect what is required by surveys and assessment MOH regularly participates in such as the Healthy Island Monitoring Framework (i.e., HIMF) and WHO SCORE Survey. • Expand the Digital Health unit's Information Management group to be responsible for coordinating all digital health data reporting, including surveys and regional/global assessments. • Implement a survey and assessment calendar to strengthen planning and coordination of resources.
2. Requirements gathering and testing	• Enhancing the process of gathering user requirements for application needs by assigning business analysts to work closely with users in each MOH division. • Build the Ministry's internal core consulting competencies. Under the new Digital Health structure, business analysts will not focus on IT but rather on understanding the health sector's business processes, information needs, and operations within their assigned divisions to build subject matter expertise and ensuring that technology is effectively leveraged to support these functions. • Improve quality of digital systems by improving testing capabilities of end-users.
3. User Technical Support	• Improvements in user support and responsiveness by assigning a dedicated Product Analyst in each MOH divisions to provide 1st level (and possibly 2nd level support).

Area for Improvement	Recommendations
4. Continuous improvement with existing applications	• Ongoing small improvements of application functionality and features as the needs of health programs and users evolve. • Practice release management to effectively bundle changes for implementation into the production environment.
5. Improved application monitoring	• Continuously monitor application uptime and performance to prevent deterioration in the end-user experience. • Product Analysts to be responsible for monitoring application uptime.
6. Continued improvement with network access	• Under the new Digital Health structure, National Desktop, Infrastructure, and Network Officer will be responsible for monitoring network performance and coordinate with DCDT for problem resolution.
7. Technical and user documentation	• All application systems will have proper documentation. This includes user, technical, and training documentation. • All documentations will be updated to reflect improvements and upgrades to the application.
8. Training documentation	• Training documentation will be developed for each application. • Videos, both in English and Bislama, will be co-developed by Business Analysts and Product Analysts and supported by other members .



SWOT Analysis

SWOT analysis provides a comprehensive framework for assessing the internal and external factors that influence the development and implementation of digital health strategies. The SWOT analysis examines four elements:

1. **Strengths:** Internal attributes and resources of MOH that support and enhance the effective implementation of the Strategy, such as having all the foundational aspects of a digital health system properly in place (i.e., technological infrastructure, skilled personnel, etc.)
2. **Weaknesses:** Internal limitations or challenges that can hinder the effective development and execution of the Strategy, such as the lack of foundational aspects (i.e., shortage of skilled personnel, etc.). Lack of funding and non-performing legacy systems can be characterized in this category.
3. **Opportunities:** External factors and trends that MOH can capitalize on to advance its Strategy, such as advancements in health technologies, favourable regulatory changes, etc.
4. **Threats:** External challenges or risks that could negatively impact the Strategy, such as regulatory barriers, cybersecurity risks, technology obsolescence, etc.

The results of Vanuatu's digital health SWOT analysis are as follows:

Strengths

Specific to Digital Health

- Strong and continued management commitment by the executive leadership to use data for evidence-based decision making.
- Comprehensive national plans (HSS, NSDP) provide clear commitments and direction.
- Digital Health Steering Committee in place.
- DHIS2 public health system as source of truth for public health and routine health facilities monthly reporting.
- Critical public health applications (e.g., Go.Data) modernized and mostly in place.
- Standardized data collection across most health programs.
- Official Health population denominators (2020 to 2030) published by area council and health zones

In General

- Strong collaboration with development partners and civil society organizations.
- Clear decentralization of health services.
- Commitment to expanding universal health coverage (UHC) through primary healthcare (PHC).
- Establishment of key committees

Weaknesses

Specific to Digital Health

- Insufficient funding allocations from recurrent budgets to implement new projects and maintain current digital systems.
- Current HIS and IT organization structure is outdated, requires new positions to reflect current and future needs.
- HIS and IT staff pay scale not commensurate with other similar government positions making it difficult to attract talent.
- Lack of alignment between PHA/ PHM, Provincial/ Hospital HIS and IT Officers, and National HIS and IT managers.
- No Hospital IT Officers across 6 hospitals.
- Hazy management alignment and span of control between provincial HIS and IT officer and MOH.
- Continued low reporting rates and timely submission from provincial health jurisdictions.
- HIS and IT units chronically understaffed.
- High staff vacancies and difficulties in filling positions and finding qualified talent in HIS and IT.
- Inadequate and lack of ongoing training of HIS and IT staff.
- Improving, but overall, lack of reliable health information and data to inform planning and decision-making.
- Continued lack of funding to maintain applications, hardware, and network infrastructure.
- Lack of documentation for health information (enterprise data dictionary/ meta data) and legacy applications (e.g., Patient Information System).
- Data integrity of the Patient Information System questionable and not reliable.
- Chronic performance issues with Government Broadband Network.
- Lack of network infrastructure in many health facilities.
- Business model for health facilities to pay for monthly connectivity costs insufficient or inoperative.
- Highly disrupted health supply chain and underutilized supply chain solution (i.e., mSupply).
- Digital Health Steering Committee not meeting regularly.

In General

- Lack of an information culture mostly due to difficulties in finding or accessing data, and the need to improve data collection and utilization.
- Insufficient health workforce.
- Resource limitations and inadequate budget support.

Opportunities

Specific to Digital Health

- Opportunities for innovation and use of technology, to improve service delivery and augment staff vacancies.
- Collaboration and cross synergy with other government digitalization projects that can benefit health.

In General

- Availability of external funding and technical support from development partners.
- Opportunity to expand and redefine partnerships with other NGOs, development partners, and potentially private sectors.
- Increased focus on promoting healthy lifestyles and preventing non-communicable diseases through community engagements.

Threats

Specific to Digital Health

- Cost of connectivity continue to be expensive and not affordable across all health facilities.
- Cybersecurity risks for data breaches and cyberattacks threatening operations of all digital health systems.
- Risks of legal action from data leakages and privacy breaches due to lack of health information policies and legislation.

In General

- Health shocks and emergencies due to climate change continue to disrupt health services and project deliveries.
- Economic and financial constraints.
- Logistical challenges due to lack of reliable air, sea, and land transport.

Drivers for Change

A critical examination of the SWOT analysis reveals several pivotal factors that will shape the new Strategy's focus and implementation.

Strengths Utilization

1. **Commitment to data-driven decision making.** Despite challenges in being able to deliver up to date health information consistently and reliably, the MOH leadership team continues to show a strong commitment to utilizing data for evidence-based decision making, which is elemental for strengthening and advancing healthcare.
2. **Existing digital health infrastructure.** The presence of established systems like DHIS2 for public health; Go.Data for multiple disease surveillance; Patient Information System for hospital admission, discharge and transfer; PACS for radiology; Heartcare for NCD management CanReg5 for cancer registry; mSupply for pharmaceutical management and MDR for medical disability registry, provides a solid base to build a promising future for digital health in Vanuatu.
3. **Supportive national policies.** Comprehensive national plans such as the *Vanuatu 2030 People's Plan*, the *Health Sector Strategy 2021–2030*, the *Role Delineation Policy*, and the existence of a Digital Health Steering Committee provide the impetus and a structured approach to guide digital health initiatives.

Addressing Weaknesses

1. **Resource constraints.** There are significant challenges related to insufficient funding and understaffing, particularly in the HIS and IT units, which hinder the effective deployment, user support, and technical maintenance of MOH's digital systems. Furthermore, attracting HIS and IT officers to the health sector has been a challenge due to recruitment challenges in a small talent market, contract management, job design, and compensation issues.
2. **Outdated infrastructure and training deficits.** The existing digital infrastructure is inadequate for current needs, and there is a lack of ongoing training for HIS and IT staff to be able to maintain the systems.
3. **Data management issues.** The accessibility and reliability of health data have been challenging due to lack of standards, documentation, and accessibility due to lack of reliable connectivity.
4. **National and provincial HIS and IT misalignment.** The commitment chain amongst the leadership team at the national and provincial levels is not as strong, leading to low timely and reporting coverage across the provinces.

Seizing Opportunities

1. **Shift in Care.** The transition towards primary health care, focusing on providing comprehensive, accessible, and community-based care that precedes and prevents health issues. Additionally, there is a shift from institutional-based care to prevention-oriented approach. Both opportunities aim to improve overall public health outcomes, but it also reduces the long-term costs associated with treating chronic diseases and other serious health conditions. Digital health plays a crucial role in facilitating the shift towards primary and preventative care.
2. **Technological innovations.** Advances in digital health technologies present opportunities to improve outcomes and operational efficiencies. Embracing innovations such as telemedicine and artificial intelligence (AI) can help address staffing shortages and enhance healthcare services delivery.
3. **External funding and partnerships.** The availability of external funding and technical support from development partners offers a chance to invest in upgrading infrastructure and expanding digital capabilities.
4. **Cross-sector synergies.** Collaboration with other government digitalization projects can create synergies that benefit the health sector, leveraging broader governmental digital transformations. To cite an example, is the agreement between MOH and the Department of Civil Registry and Identity Management in July 2024 to adopt the National ID as the country's first National Health Number.

Mitigating Threats

1. **Connectivity and cybersecurity risks.** High costs of connectivity and significant cybersecurity risks pose threats to the stability and security of digital health systems as experienced in the November 2022 cyberattack on Vanuatu's government systems. These issues are further exacerbated by the lack of comprehensive health information policies and legislation. The mitigation driver is to collaboratively work with DCDT in strengthening the security of digital assets and to put in place the legal infrastructure that has a comprehensive framework of laws, regulations, and guidelines designed to protect the integrity, confidentiality, and accessibility of health data.
2. **Regulatory and environmental challenges.** Regulatory restrictions on technologies like the use of Starlink and the high risk of natural disasters has evidently disrupted health services, posing ongoing challenges to strengthen healthcare delivery through digital health initiatives. The mitigation driver is to work with the Vanuatu Telecommunications Radiocommunications and Broadcasting Regulator (TRBR) to further deregulate entry of new service providers, to seek partnerships with telecommunication services providers and retailers, and to lower the cost of acquisition and ownership.
3. **Lack of resilience to climate impact.** In regions prone to natural disasters like Vanuatu, healthcare delivery is regularly interrupted in providing crucial support to both patients and healthcare providers in the aftermath of climate events or disasters. The mitigation driver is to be able to effectively communicate from ground zero from the nearest healthcare facility, ensure healthcare data is up to date and safeguarded, digital health systems are accessible even during disasters, and ensure service availability by incorporating resilient infrastructures that can help the health system adapt to unforeseen environmental challenges. This also include tooling the Health Emergency teams with the digital tools for rapid response.

Part

2

Strategic Framework

Digital Health Strategy Framework

The Vanuatu Digital Health Strategy Framework provides a cohesive structure that aligns the country's digital transformation efforts with its broader health sector goals.

At the heart of the framework is the Vision to improve health equity, expand universal healthcare access, and transition from paper-based systems to an integrated digital health ecosystem. This vision is both a response to current health system limitations and a forward-looking ambition to modernize service delivery, increase resilience, and better meet the needs of all Ni-Vanuatu, especially those in rural and remote communities.

Vanuatu Digital Health Strategy Framework

1 Vision and Goals
- Improving health equity
- Ensuring universal healthcare access
- Move from paper based health to digital health

2 Core Pillars
- Strengthening health information
- Achieving universal health coverage
- Improving patient continuity of care
- Building climate resilient health systems
- Strengthening foundational health

3 Enablers
- Policy and regulatory framework
- Data security and privacy standards
- Financing and investment
- Data interoperability guidelines
- Department of Communications and Digital Transformation

4 Stakeholders
- Government agencies
- Patient population
- Healthcare providers
- Development partners
- Technology providers
- Implementation partners

5 Implementation
- Phased rollout and integration plan
- Feedback and monitoring systems
- Improved infrastructure to support digital health strategy

6 Outcomes
- Improved health indicators
- Efficiency in service delivery
- Stakeholder satisfaction
- Upgraded digital health architecture

The Strategy is built on five Core Pillars: (1) strengthening health information, (2) achieving universal health coverage, (3) improving patient continuity of care, (4) building climate-resilient health systems, and (5) reinforcing foundational health services. These pillars represent the thematic priorities that anchor all digital interventions, ensuring that digital tools are not implemented in isolation but are embedded within efforts to strengthen the entire health system.

To support these pillars, a set of strategic Enablers are identified—ranging from the development of policy and regulatory frameworks to investments in data security, financing, and interoperability standards. These enablers create the environment necessary for sustainable digital health transformation. In particular, the role of DCDT will be central in helping the Ministry meet its digital health agenda by providing the national ICT infrastructure.

The success of this Strategy relies heavily on inclusive and coordinated engagement with a broad range of stakeholders. These include government ministries and agencies, healthcare providers, patients and communities, donors, technology providers, and implementing partners, including the private clinics. Each stakeholder group has a distinct but complementary role in shaping, supporting, and sustaining digital health initiatives. Their collective participation will help ensure that the Strategy is grounded in country needs, are technically sound, and institutionally supported.

Implementation of the Strategy will follow a phased rollout approach, guided by a detailed integration plan, supported by robust monitoring and feedback systems, and underpinned by improved digital infrastructure. Active engagement with a diverse group of stakeholders—including government agencies, healthcare providers, donors, technology partners, and the community—is essential to success.

Ultimately, the expected outcomes of the strategy include improved national health indicators, greater efficiency in health services delivery, higher satisfaction among users and stakeholders with Vanuatu's health information and digital systems, and the development of a modern, fit-for-purpose digital health architecture for Vanuatu.

Guiding Principles

The guiding principles in the development of a digital health strategy serves as foundational tenets that influence the planning, execution, and evaluation of all activities associated with this Strategy. The current guiding principles adopted by the past digital health strategy included, as quoted in italics:

1. ***Strategic alignment.*** *System design and development will be driven by the National Sustainable Development Plan and the Health Sector Strategy and will align with overall eGovernment policies and initiatives.*
2. ***Strong governance.*** *Implementation of the strategy will have a strong clinically led governance structure, supported by good policies and processes.*
3. ***Focus on building blocks and capacity development.*** *The initial phases of the implementation will focus on building the underlying essential human capacity and organizational policies and processes, as well as key technical capacity such as unique person identifier and basic IT infrastructure.*
4. ***Architectural approach.*** *Development will follow an architectural approach.*
5. ***Standards-aligned where appropriate.*** *Systems development will align with appropriate international standards such as HL7 FHIR and DICOM where appropriate. As Vanuatu essentially has a single healthcare provider, that is the MOH, interoperability is much less of an issue than it is in countries such as Australia or the USA ….*
6. ***Investment principle.*** *Build on existing capacity and success. Focus on benefits realization from day one and build in monitoring and processes to ensure this is tracked and reported. Ensure sustainability before commencing investment.*

Observations are as follows:

1. ***Proposed modifications to Guiding Principle #2.*** The new Strategy will ensure that members of the Digital Health Steering Committee are represented across the health sector, and not entirely made up of clinicians.
2. ***Proposed modifications to Guiding Principle #5.*** The new Strategy does not make it optional to introduce standards. In other words, "standards" must align, meaning it will be mandatory for all digital health solutions to be standards-based. Even, though Vanuatu has only one single health provider (i.e., MOH), interoperability is just as much of an issue in Vanuatu as it is in every health jurisdiction globally.

Given the complex nature of implementing digital health systems and health information practices in Vanuatu, additional principles to be introduced under this new Strategy include:

7. **Strategic direction.** Provide a clear framework for decision-making throughout the lifecycle of the strategy. By establishing non-negotiable standards and expectations, the Digital Health Steering Committee is to steer the development and deployment of digital health solutions towards its intended strategic goals.
8. **Value alignment.** Ensure that the Strategy aligns with the core values and ethical standards of MOH to guarantee that technological advancements are implemented in a way that respects patient rights, promotes equity, and adheres to medical ethics.
9. **Minimum solutions.** Minimize the number of new applications or application-types to be introduced, due to the resources constraints in Vanuatu and the health sector. Focusing on minimum solutions ensures that the most critical needs are met with the available resources.

10. **Commitment to resilience.** With Vanuatu being one of the most disaster-prone countries in the world, digital health system should be resilient and be useable in a variety of disaster and outage situations such as the lack of power and connectivity.
11. **Adopt pragmatic solutions.** Solutions will be developed using pragmatic approaches that favour feasibility over architectural purity. A simple solution that provides early benefits to the healthcare community will be preferred over a complex solution that may provide additional benefit but take longer to implement. Solutions should complement rather than replace existing solutions where appropriate, cost-effective, and feasible. Lastly, a mix of paper and electronic options should be considered where it is feasible and pragmatic to do so, noting that the move to a fully electronic health information system requires significant amount of investment, takes time and requires significant organizational and end-user engagement, adoption, and sustainment.
12. **Adopt tried and proven solutions only.** This ensures reliability and safety in healthcare delivery to minimize risks associated with unproven solutions with no or minimal track record. This includes solutions that are still in the early or late stages of development, including experimental technologies. Solutions to adopt will be based on several years of successful track record in several countries and can be purchased off-the-shelf with minimum customization.
13. **Assess whole-of-life costs.** The business and social value of any digital health solutions to be introduced to Vanuatu should be assessed as part of the overall digital health environment, and against the development, replacement, deployment, and operational costs involved. Solutions should be acquired, replaced, decommissioned, developed, and deployed at the least cost while ensuring fitness for purpose of an overall system.
14. **Consistency and cohesion.** As digital health initiatives often involve multiple stakeholders and cross-functional teams, it is important to maintain consistency and cohesion in the adoption of technology across various projects, divisions, and government agencies. Not only is the uniformity essential for integrating different digital systems seamlessly and effectively, but to ensure that the systems can be supported by organizations such as DCDT.
15. **Independence of choice.** Despite various support received from several development partners, ultimately it will be MOH's decision on the digital solution to implement. MOH will maintain control over the procurement process to foster autonomy and respect for the country's decision, including mandatorily going through a competitive bidding process based on detailed requirements defined by the users of the solution.

These 15 guiding principles are instrumental in shaping a digital health strategy that is ethical, effective, and aligned with the broader goals of Vanuatu's healthcare system. They ensure that the strategy not only embraces technological advancements but also addresses the complex needs and challenges of modern healthcare in Vanuatu.

Part

3

Five Pillars of the Digital Health Strategy

The new Strategy is categorized into five strategic pillars. Each pillar refers to a broad, overarching priority area that will guide the health sector's specific initiatives and actions. These pillars are designed to align the Strategy's objectives with MOH and the provincial governments' health goals, ensuring that every tactical action contributes to a larger and cohesive plan to systematically progress towards transforming Vanuatu's healthcare through digital health.

Pillar 1

Strengthening Health Information

Past digital health strategies have been primary focused on the technology. Consequently, current health information management have impaired decision making resulting in ineffective or lack of health policies, misallocation of resources, lack of insights to potential challenges, difficulty in assessing root cause of problems, and challenges to respond swiftly to public health emergencies including disaster response. The lack of data management practices has also burdened the healthcare workers with administration and data collection challenges. It has also made it difficult for the HIS unit to be custodians of health information.

Under Pillar 1, there are three key tactical initiatives or strategic directions:

1.1. Institutionalize data management practices
1.2. Build an information culture
1.3. Maximize space efficiency with digital archiving

1.1. Institutionalize Data Management Practices

Technology is a tool, not an end. The goal of using technology is to generate accurate and timely information to support decision-making and improve outcomes. The lack of good data management practices has wide-ranging and severe consequences, impacting everything from clinical and public health decisions to overall health system efficiencies. Therefore, institutionalizing data management practices is a crucial first step for ensuring that health information is accurate, readily accessible, and actionable. This involves a detailed and systematic approach to managing the entire lifecycle of health data[8] and treating it as an asset because *people, processes and technology always changes, but facts or data, do not*.

By prioritizing data management, health systems can leverage trusted information to drive evidence-based policymaking, optimize resource allocation, and respond more effectively to public health challenges and emergencies.

8 i.e., from collection and storage to analysis and utilization.

Therefore, under the new Strategy, institutionalizing good data management practices will include:

a. **Standardize health data.** MOH will adopt international standards such as HL7, FHIR, and ICD-11 to ensure compatibility and interoperability across different systems and platforms. Furthermore, processes will be institutionalized to ensure consistency across different sources. This includes standardizing data formats and terminologies through the ongoing population and update of the Ministry's Enterprise Data Dictionary which will be the responsibility of the Information Management group under the new Digital Health organizational structure.

b. **Establish a Data Governance Framework.** A framework will be established for data management policies, standards, and practices across the healthcare system. This framework will guide the Information Management Subcommittee and vertical programs [Strategic Action 5.2b] to strengthen and protect the Ministry's data assets. The framework will guide policies, procedures, standards, roles, and responsibilities to ensure data is accurate, secure, accessible, and used effectively. The goal is to maximize the value of data while ensuring compliance with regulations and industry best practices

c. **Develop clear data governance SOPs.** MOH will develop and implement standard operating procedures (i.e., "SOPs") that define data ownership, roles, responsibilities, data sharing, and data privacy policies. The set of policies to be developed include but is not limited to developing policies that act as guard rails around data use, the roles of each stakeholder in the data lifecycle; and adherence by healthcare workers to established standards such as the use of official population denominators, data formats, and terminologies. The data governance SOPs will also be institutionalized at the provincial levels with the help of the Provincial HIS Officers and Provincial Health Administrators (i.e., PHAs)

d. **Continuous improvement to strengthen data quality.** Routine data quality reviews will be jointly conducted by provincial and national teams. Provincial and Hospital Health Information System (HIS) Officers will collaborate closely with National Information Management Officers to strengthen data entry processes, including the identification and investigation of data outliers and inconsistencies. This partnership aims to ensure higher accuracy, completeness, and timeliness of health data across all levels. Regular audits, at least once every two years, will be conducted to assess the accuracy, completeness, and timeliness of data. The outcome of the audit is to identify common data quality issues across the healthcare system and to implement corrective measures at the national and provincial levels. Furthermore, there will be an ongoing processes for MOH to work collaboratively with hospitals and provincial health facilities to clean data, including removal of duplicates, correcting errors, and filling missing values.

1.2. Build an Information Culture

The absence of a centralized and user-friendly data management system has significantly limited the Ministry's ability to access information on demand, thereby undermining timely, evidence-based decision-making.

Despite the hard work of many at MOH to generate data for decision making, the current environment does not lend itself in building an information culture. The file server currently in place are difficult to use, and at times, inaccessible. When accessible, it is difficult to search for information since it is primarily designed simply to store, manage, and provide access to files over a network. The user interface and file navigation can also be difficult to many.

Due to these challenges, majority of MOH's data reside on individual computers and laptops. Consequently, due to the Ministry's data being siloed, it is difficult to provide executives, medical superintendents, public health managers, and public health administrators with timely access to information needed to manage resources, including a holistic view of the status of different clinical services delivery and public health programs.

An organization with a strong information culture is one that recognizes the value of information as a critical asset and integrates data-driven decision-making into its core operations. It also values and invests in ensuring the quality of data is high and irrefutable. Above all, an organization that builds and promotes an information culture empower their human resources with tools such as a corporate Intranet. Transitioning to a more robust, flexible, and intuitive digital information management system is critical for empowering healthcare workers at all levels to access, analyze, and utilize data.

Therefore, under the New Strategy, building an information culture at MOH will unfold as follows:

1. **Implement a Corporate Intranet.** A Corporate Intranet will be implemented to facilitate communication, collaboration, information sharing, and access to various data and resources within an organization. Unlike the Internet, the Intranet is an internal facing web-based system that will run on the government's network. It will be designed to be used only by the national and provincial health staff to support information access, internal communication, collaboration, and information sharing – all attributes towards building an information culture focused to strengthen access and management to health information. The Intranet will provide a centralized platform to be the "single source of truth" where ministry and provincial health employees can access up-to-date and accurate information, ensuring consistency and reliability. Like the Internet, information is easily accessible (like how one would "google" the Internet), but only to authorized MOH users, fostering transparency and ensuring that everyone has the same data and insights.
2. **Develop management dashboards.** Standard data visualization dashboards will be implemented for Medical Superintendents, Public Health Managers, and Public Health Administrators with timely data from a single source of truth to provide them with a status of hospital operations and public health programs. The goal is to enhance decision-making, improve resource allocation, track performance, monitor health trends, and support strategic planning and regulatory compliance.

1.3. Maximize space efficiency with digital archiving

Vanuatu, like several Pacific countries, has a legacy of paper records which has served these countries well in past years. However, this reliance on paper records is problematic. All hospitals particularly Vila Central Hospital (VCH), is running out of space.

Some paper records cannot be read due to its age, or having been damaged due to rain, etc. Sometimes patient records cannot be located because it has been misfiled. Despite the Patient Information System (PIS) working in both VCH and the Northern Provincial Hospital (NPH), health data remains predominantly paper-based and manually collected. Paper files are also considered the master files for patient records due to fragmented patient records on PIS. Patient information is manually created and stored at individual health facilities, while not being accessible for viewing at other facilities. In most cases, data in PIS is often supplementary to paper documentation leading to double documentation.

According to the *Code of Practice on Records and Information Management*[9], section 10.2 states that *"records should be kept for as long as they are needed by the government agency or relevant private entity"*. Therefore, it will be up to MOH to determine the useful lifespan of patient paper records.

Under the New Strategy, the archiving approach at MOH will unfold as follows:

a. **Work with Government legal framework.** Since there is no existing Health Information Policy or Act in place, MOH will work with DCDT, the Vanuatu National Archives, and the Office of the Attorney General (OAG) to conduct thorough legal and compliance checks to ensure that the health sector decision on archiving and destroying paper records is in accordance with national laws regarding data retention, privacy, and records management.

b. **Acquire a Document Management System (DMS).** The acquisition of a Document Management System (DMS)[10] will modernize the way health records are stored, accessed, and managed, ensuring a seamless transition from paper-based to digital systems. By digitizing and securely archiving patient records, the DMS will improve data accessibility, enhance operational efficiency and free up much needed physical space at hospitals. This foundational step is critical for advancing digital health initiatives and integrating legacy records into a national electronical health record system [Strategic Action 3.2].

c. **Scan and electronically archive patient records.** Upon establishing a legal way forward, paper records that must be kept will be converted into digital formats through scanning and stored in the DMS. Furthermore, future clinical systems such as the National Electronic Health Record (NEHR) system will access scanned paper records to improve accessibility and continuity of care.

d. **Destruct non-essential records.** Non-essential paper records that are not required by law to be kept can be destroyed. MOH will have to decide on a case by case, or subject by subject basis on whether some paper records should be digitalized before it can be destroyed. Strict protocols need to be in place to ensure that any sensitive information is irreversibly destroyed.

e. **Use offsite storage.** For paper files that are infrequently accessed, but must be retained for legal or historical reasons, MOH will designate a secure off-site storage facility. This will help comply with both space management needs and regulatory requirements.

9 https://rti.gov.vu/images/records_and_information_management/Code_of_Practice.pdf

10 The acquisition of a Document Management System will depend on several key factors, including the finalization of the Health Information Retention and Disposal Policy [Strategic Action 5.3b] and the chosen approach for implementing the National Electronic Health Record System [Strategic Action 3.2].

Pillar 2

Expanding Universal Health Coverage

Universal Health Coverage (UHC) aims to ensure that health services are high-quality, accessible, and affordable for all. However, challenges remain in achieving equitable access for everyone in need, as well as delivering services at the expected quality level without placing a financial strain on those who receive them. It is also essential to prioritize the specific health needs and rights of children, as outlined in the United Nations Convention on the Rights of the Child (CRC). One of the primary obstacles is the geographic disparity in access to healthcare, particularly in rural or remote areas, where healthcare infrastructure and personnel are often lacking.

In May 2018, Member States and the World Health Assembly adopted a resolution on Digital Health, collectively recognizing the value of digital technologies in advancing Universal Health Coverage (UHC) and achieving other health-related goals within the Sustainable Development Goals (SDGs). This resolution urged ministries of health *"to assess their use of digital technologies for health [...] and to prioritize, as appropriate, the development, evaluation, implementation, scale-up and greater use of digital technologies, as a means of promoting equitable, affordable and universal access to health for all, including the special needs of groups that are vulnerable in the context of digital health."*[11]

From a digital health perspective, limited infrastructure and connectivity further exacerbate these challenges. Many islands still face poor internet connectivity, inadequate hardware, and underdeveloped infrastructure (e.g., energy), hindering the adoption of telemedicine, mobile health applications, and electronic health records. Equally important is the need to promote digital inclusion[12], ensuring that digital health solutions are designed and deployed in ways that are accessible and affordable to all—especially for vulnerable and marginalized populations. Bridging the digital divide through inclusive policies and community-based digital access strategies is critical for realizing the full potential of UHC in Vanuatu. However, there will be other areas in the new Strategy that can shift the dial in helping the country achieve UHC.

11 https://bit.ly/3CNcasl

12 Promoting digital inclusion is essential to achieving equitable access to digital health services under UHC. As Vanuatu advances its digital health agenda, specific efforts must be made to ensure that vulnerable and marginalized groups—such as children, persons with disabilities, the elderly, and remote island populations—are not left behind. This includes addressing digital literacy, affordability of devices and connectivity, accessibility for those with disabilities, and the availability of content in local languages. Digital inclusion is not just a technical issue, but a matter of equity, rights, and social justice, echoing the principles set forth in the UN Global Digital Compact.

Therefore, under Pillar 2, there are six key tactical initiatives:

2.1. Adopt the National ID as the National Health Number (NHN)

2.2. Automate Vital Events

2.3. Strengthen Primary Health Care Through Telemedicine

2.4. Scale up Heartcare NCD System

2.5. Implement Community Outreach Capabilities

2.6. Promote Public Health and Prevention

2.1. Adopt the National ID as the National Health Number (NHN)

On June 29, 2024, MOH and the Ministry of Internal Affairs ("MOIA") signed an agreement[13] to streamline the notification of vital events *and to adopt the country's National ID as the country's first National Health Number (NHN) as the country's unique health identifier for each patient.*

The NHN will be vital for monitoring and ensuring efficient access, utilization, and continuity of care across the healthcare system. It plays a key role in achieving UHC goals, promoting equity, enhancing health security, and improving well-being across populations. This importance was evident during the global pandemic, when individuals were required to present verified COVID-19 test results and vaccination statuses. Adoption of the NHN will facilitate the tracking and monitoring of healthcare delivery, enabling policymakers to identify underserved populations and address disparities in access, utilization, and outcomes. In turn, this promotes fairness by ensuring that all individuals can access essential health services without discrimination of exclusion.

Therefore, under the New Strategy, introduction of the NHN will unfold as follows by:

a. **Amend Vanuatu National Identity Act with health-specific provisions.** To meet the criteria of being a genuine unique health identifier, the NHN must be legislated, independent, lifelong (from birth), and universal. Working with the Office of the Attorney General, the legislation must clearly define the NHN as the country's official, unique health identifier and to stipulate that the NHN is mandatory for all citizens from birth, and remains valid throughout an individual's life, regardless of changes in name, residency, or healthcare provider. Furthermore, a few enabling and supporting policies that support a framework to guide decision-making must be established such as mandating the automatic linking of the National ID data with health information systems to ensure synchronization of key demographic information (e.g., birth, death, present address, address changes) between the civil registry and health record is one such policy.

b. **Develop a Civil Registry and NHN integration technical blueprint.** The main purpose of the blueprint is to ensure interoperability between the country's digital health systems and the national civil registry. This include facilitating consistent identification of individuals[14] across both systems for better healthcare delivery, resource allocation, and population health management. At the minimum, the scope of the blueprint, include the following: review current digital health systems' interoperability capabilities to identify gaps such as differences in data formats; assess legacy

13 https://bit.ly/3CLObtn

14 The Vanuatu's National Identity Act No. 27 of 2021 specifies that National ID cards are issued to individuals confirming their legal identity and citizenship. This indicates that the current framework is designed to issue National Identity Cards exclusively to citizens of Vanuatu. Therefore, the health sector will develop a parallel identifier system for non-citizens which may possibly include integration with the MIDAS Immigration system.

applications that lack API access[15]; and data flow maps between civil registry and patient registration, demographic data synchronization, birth and death registration; error-handling mechanisms for cases where there are discrepancies between health records and the civil registry; data privacy and security controls; and the design of an interoperability framework that address data standards, API design for data retrieval and data updates, and matching algorithms for deduplication.

c. **Improve patient biometrics.** Adopting biometrics can significantly enhance the accuracy, security, and efficiency of healthcare delivery. In the absence of a physical card, biometrics serve as the foundation for reliable patient identification, ensuring that healthcare records are consistently accurate and accessible across the continuum of care, regardless of location. Under the auspices of the Memorandum of Agreement in place between the Ministries of Health and Internal Affairs, the health ministry is in a good position to expand the national biometric coverage starting with the automation of the birth registration of newborn babies. Over time, this guarantees that the health sector has access to complete population data.

2.2. Automate Vital Events

Automating vital events such as birth and death notifications fundamentally improves the achievement of UHC by enhancing the accuracy and timeliness of population data for health system planning and ensuring equitable access to health services from birth. This initiative also highlights the right of every child to a legal identity and access to healthcare services from birth, ensuring child-centered digital health initiatives such as immunization tracking and pediatric EHRs.

Scheduling of postnatal care services are also enhanced for mother and child since the new National Electronic Immunization Registry (NEIR) [Strategic Action 3.1] will be integrated to the national civil registry. The automation also reduces the need for manual data entry and administrative paperwork.

The signing of an MOA between the Ministry of Health and the Department of Civil Registry and Identity Management in 2024 marks a pivotal step towards closer collaboration.

Therefore, under the New Strategy, automating vital events will unfold as follows:

a. **Implement DHIS2 Vital Events module.** Implement the DHIS2 Vital Events tracker to provide in near real-time live birth, stillbirth, and death notification and registration.

b. **Digital registration at point of care.** Vanuatu's maternity wards at hospitals will be equipped with footprint recognition devices to capture the babies' footprint as a biometric for personal identification during the civil registration process.[16] However, before a child enters the school system at approximately 5 years old once the child's ridge patterns are more developed, fingerprints will be captured as an additional biometric and becomes the primary biometric to use. The two biometrics allow for cross-verification for successful identification and reduces the chances of misidentification. Similarly, deaths will trigger death registration and deactivation of the NHN and the National ID in the national civil registry system (but archived and cannot be reused) to prevent misuse of the number for healthcare or social benefits.

15 API access refers to the ability of a system, application, or user to interact with a software service or platform through an Application Programming Interface (API), enabling the exchange of data and functionality. It allows external applications to request, retrieve, or manipulate information securely based on predefined permissions and authentication protocols.

16 Currently, Area Administrators (i.e., local government unit) help facilitate the registration of births outside of the hospital setting in rural communities. A process will be developed on how biometrics will be captured.

2.3. Strengthen Primary Health Care Through Telemedicine

In resource limited-settings, telemedicine has proven to strengthen primary health care by improving access and continuity of care. By removing geographical barriers, a common phenomenon in geographically constrained countries like Vanuatu, telemedicine solution allows patients in remote or underserved areas to access medical consultations and preventative care (e.g., NCD Hub) without the need for physical travel.[17] It also enables healthcare providers to deliver regular follow-ups, manage chronic diseases, and offer health education remotely, ensuring better health outcomes and reducing the burden on healthcare facilities. Furthermore, the intention of telemedicine in Vanuatu is to also increase accessibility and promote inclusivity, reach vulnerable populations such as the elderly, people living with disabilities, and the rural communities in general, contributing to more equitable health care.

Therefore, under the New Strategy, introducing telemedicine as a national healthcare service will unfold as follows:

a. **Design the telemedicine model.** The telemedicine implementation journey starts by designing the telemedicine model and scope of services to be provided via telemedicine, such as primary care consultations, remote specialist consultations, emergency consultation, chronic disease management, referrals, follow-up care, and emergency care. Clear patient pathways must be developed for each of these scenarios, including the telemedicine modality of asynchronous interaction (i.e., not in real time) between patients and care providers.

b. **Conduct a regulatory review.** Policy forms the foundation of a secure digital health solution such as telemedicine. The Ministry will conduct a regulatory review to ensure there are laws or regulations to support the chain of patient trust in using telemedicine. Given the time it could take to pass legislation or policy, the Ministry will introduce a short-term framework including a short-term waiver be considered and exercised during emergency situations such as a disaster. This immediate framework includes providing guidance on using telemedicine for administrative, consent, clinical protocol, health data management, privacy and security.

c. **Implement teleconsultation capabilities.** Currently, there are roughly over 600 international vendors providing telemedicine solutions. A detailed business, technical, and management requirements will be developed to competitively select the country's national telemedicine platform. This includes the ability to record patient encounter during every teleconsultation to ensure patient records are up to date.[18] A controlled proof of concept (i.e., POC) study for 6 months will also be introduced before making decisions to scale up telemedicine services across the country. The focus of the telemedicine capabilities to deploy at the primary healthcare level is teleconsultation.

d. **Partner with Area Council for shared infrastructure.** Telemedicine requires reliable connectivity (i.e. a minimum of 3 Mbps upload and download) for the solution to be effective. Unfortunately, most health facilities do not have Internet connectivity, nor do they have the operating budget to pay the monthly cost. As the Government of Vanuatu continue to forge ahead with its Decentralization Program to bring public services (and improve energy and network infrastructure) across the country's 72 Area Councils, the Ministry will forge a partnership with the Department of Local Authorities and Area Councils to allow healthcare workers access to the Internet and its conferencing facilities.

17 Abid Haleem, Mohd Javaid, Ravi Pratap Singh, Rajiv Suman; "Telemedicine for healthcare: Capabilities, features, barriers, and applications", Science Direct Sensors International, Volume (2021) https://doi.org/10.1016/j.sintl.2021.100117

18 Depending on when the National Electronic Health Record system will be implemented and integrated, the teleconsultation system must be able to store the minimum data set that will then synchronize with the NEHR in non-real time.

2.4. Scale up Heartcare NCD application

The Heartcare NCD application was launched at the Port Vila NCD Hub in December 2022. It is an NCD registry that also standardizes CVD risk prediction and patient management. Targeted for primary healthcare, and in line with WHO PEN guidelines,the software also has a clinical decision support system that recommends clinical procedures and health counselling customized to the patient's CVD risk level and other relevant clinical features. The Ministry will roll out Heartcare across the country in future NCD hubs.

a. **Establish clinical and technical requirements at each provincial sites.** As each targeted site for implementation, the Ministry will define the clinical workflow and hardware requirements. The intent is to maintain a standard workflow of operation across all Heartcare implementation sites, including standardized patient pathways and reporting.
b. **Rollout Heartcare in provincial sites.** The Heartcare application will be rolled out in the provinces under a phased approach. Based on implementation experience in Port Vila, ongoing digital literacy and Heartcare training will be conducted.
c. **Upgrade Heartcare application.** The Heartcare software will be upgraded to meet the needs of a nationally integrated NCD Hub. This will include integration to the civil registry system using the National ID[19], DHIS2, telemedicine, the national electronic health record system, among others.

2.5. Implement Community Outreach Capabilities

Vanuatu hosts several medical missions and community outreach programs each year. For instance, naval ships from foreign countries regularly visit Vanuatu to provide medical assistance.[20] Several NGOs also continue to support the country's health sector by assisting with vaccinations. The problem is that patient encounters from the outreach programs are primarily captured on paper, on the mission's own recording tool, or not captured at all. In essence, patient encounters by the medical mission team are not included in the patient's longitudinal history. To exacerbate the situation further, the Ministry does not have the capacity to retrospectively enter paper patient records into its digital systems.

Therefore, under the new Strategy, a Community Outreach System will unfold as follows:

a. **Develop a digital community outreach strategy.** The Ministry will develop a plan for designing, implementing, and scaling digital solutions that support outreach activities, such as vaccinations, health campaigns, community-based interventions, and mobile service delivery – bypassing the need for the Ministry to retrospectively enter patient information. This strategy will focus on enhancing data collection, communication, and service coordination with the ultimate outcome of ensuring that patient encounters through an outreach are documented in every patient record.
b. **Extend digital applications to medical missions.** The Ministry will upgrade its current digital systems to enable medical missions to securely access and utilize the Ministry's digital health platforms.

19 At the time this Strategy was written, the Department of Civil Registry and Identity (CRIM) is upgrading its national civil registry system (i.e. from RV4 to RV5). Therefore, integration was not possible at this time. It is anticipated RV5 will go live in early 2025.

20 https://bit.ly/3CPOvHy

c. **Develop and publish outreach API.** If medical missions need to utilize their own digital systems, the Ministry will develop and publish standardized APIs, providing them to the mission teams in advance of their arrival. This will facilitate seamless integration and enable secure data exchange between the medical mission and the Ministry's digital health systems. For the medical missions to use their own system, they must comply with International Patient Summary (IPS) standards.[21]

2.6. Promote Public Health and Prevention

The People's Plan emphasizes education and awareness as key drivers of sustainable development and well-being. By leveraging digital platforms to promote public health, the New Strategy supports the Plan's vision of creating knowledgeable and empowered communities. To support the goals of the People's Plan in improving the population's overall well-being, mobile applications will be developed to deliver culturally relevant and customized health promotion messages, including dietary advice, exercise routines, mental health awareness, and substance abuse prevention.

Therefore, under the New Strategy, mobile app for public health promotion will unfold as follows:

a. **Design user friendly mHealth apps.** Simple, intuitive, and culturally appropriate mHealth applications that provide preventive health information, reminders, and interactive health assessments will be introduced. The apps will be accessible on basic mobile phones and smartphones, especially for populations in rural areas. The mHealth app targeted to help patients with non-communicable diseases (NCDs) will be prioritized. The NCD mHealth app is anticipated to provide educational resources and personalized reminders to promote disease awareness and encourage healthier lifestyle choices. These apps will be designed to provide tailored health tips, medication adherence notifications, and information on managing conditions like diabetes or hypertension to help patients take an active role in improving their health outcomes. Working together with UNICEF, the Strategy will also explore the use of mHealth apps to promote child health, well-being and development.

b. **Leverage SMS and IVR Services.**[22] SMS has proven to be effective in reaching people without smartphones where access to carrier services (e.g., Vodafone or Digicel) data is limited or unreliable. The Ministry will continue to broadcast health promotion content by SMS. However, this time, health promotions can be more targeted by segmenting the recipient of the SMS by integrating the service to DHIS2 and the new national EHR. Furthermore, automated SMS-based reminders for vaccinations, prenatal checkups, and if feasible, for medical adherence will also be introduced.

   The Ministry will also explore the use of IVR-based mHealth services to serve populations with low literacy levels so they can access preventive health information by simply calling a number and interacting through voice commands.

21 HL7 FHIR and CEN/ISO 17269

22 SMS is a text messaging service that allows users to send short, text-based messages (typically up to 160 characters) between mobile devices. It operates over cellular networks and does not require an internet connection. IVR is an automated telephony system that interacts with callers, gathers information, and routes calls to the appropriate recipient. It allows users to interact with a system through pre-recorded voice prompts and keypad inputs or speech recognition.

Pillar 3

Improving Patient Continuity of Care

This section of the Strategy addresses a critical need in Vanuatu's healthcare system—ensuring that each patient's journey through the country's health system is seamless, coordinated, and backed with detailed patient information that can be accessed anytime and anywhere.

The adoption of the National ID as the National Health Number marks a pivotal moment to introduce this section, as it provides a standardized, unique identifier that can seamlessly link each patient's health information across all healthcare interactions. With a unified health identifier, patient records, whether immunization history, lab results, or radiology reports, can be easily accessed and accurately matched to the correct individual, creating a cohesive and reliable health record. This alignment allows each healthcare provider to view a complete, longitudinal record of care, supporting continuity and enhancing decision-making. Institutionalizing the National Health Number not only strengthens patient safety by reducing misidentification risks but also lays the essential groundwork for integrated digital systems, making it an opportune moment for advancing Vanuatu's healthcare infrastructure toward a more coordinated, patient-centered model.

Continuity of care is fundamental to effective healthcare delivery, yet it is frequently disrupted by fragmented records, isolated facilities, and constrained data sharing between hospital departments. Additionally, clinicians, already stretched by demanding patient workloads, face the added burden of tracking down essential pathology or radiology reports. Without a complete, consistent, longitudinal view of each patient's medical history, clinicians face barriers to providing timely and appropriate care, which can result in redundant tests, missed diagnoses, and compromised outcomes. This section seeks to eliminate those barriers by laying a digital foundation that connects each stage of care, allowing healthcare providers across the system to access and contribute to a unified health record.

In a country as geographically dispersed as Vanuatu, where patients often traverse vast distances and visit multiple facilities, this integrated approach is not merely a convenience. It is essential. When clinicians have access to a complete and longitudinal health record, they can make more informed and timely decisions, ultimately reducing redundancy, improving diagnostic accuracy, and enhancing the quality of care. A strong focus on continuity of care underpins Vanuatu's commitment to equitable health access and quality service delivery, bridging the gaps caused by physical distances and limited resources. By moving towards a patient-centered, digitally connected system, this pillar aims to significantly elevate the healthcare experience for both patients and providers alike.

For many years, clinicians in Vanuatu have struggled to manage patient records while the Ministry's focus has remained primarily on public health solutions for the past decade. Consequently, doctors, nurses, and technicians had to devise their own methods to cope with the gaps. Many doctors have adopted their own record-keeping systems, including distributing patient booklets and maintaining personal spreadsheets and databases, due to the current Patient Information System's functional inadequacies, limited access, and intermittent system performance issues. For instance, in the Laboratory Department, three custom-built Microsoft Access databases (one each for hematology, serology, and pathology) have been developed, alongside the use of WHONET for microbiology and CANREG5, a cancer registry software introduced in 2022 but not yet actively utilized. Although a PACS (Picture Archiving and Communication System) called Voyager exists,[23] challenges with patient indexing have made searching cumbersome, and regular backups of this system have not been performed for several years, if at all. *These systems operate independently, requiring users to manually copy and transcribe results between systems — a process that increases the risk of errors and compromises patient safety.*

To address these challenges, Pillar 3 focuses on establishing four key digital systems:

3.1. National Electronic Immunization Registry (NEIR)

3.2. National Electronic Health Record (NEHR) system

3.3. National Laboratory Information System (NLIS), and

3.4. National Radiology Information System (NRIS)

Each of these systems plays a distinct role in the continuity of care. The immunization registry will centralize vaccination records, enabling preventive care continuity. The EHR system will consolidate patient health data, creating a comprehensive medical record accessible across health facilities. The NLIS will improve access to lab results, ensuring that clinicians have timely diagnostic data at their fingertips, while the NRIS will allow for the seamless sharing of radiology images, enhancing diagnostic accuracy and care coordination.

Assuming implementation of these systems are done well, and the user adoption of these systems are strong, together these systems represent a transformative approach to healthcare in Vanuatu, ensuring a patient-centered approach where every patient interaction is informed, coordinated, and part of a continuous health journey.

However, while these systems hold great promise for improving healthcare delivery, there are significant challenges that must be addressed to ensure their successful implementation. The greatest concerns and risks lie in the lack of clinical resources to participate and guide the implementation, and the low user adoption of these systems, as seen in previous implementation efforts. The risk of low adoption is heightened by hospital staff's strong preference for their own methods, developed over a decade of managing without much support.

3.1. Rollout the National Electronic Immunization Registry (NEIR)

The Ministry kicked off its national electronic immunization registry (NEIR) project in late November 2024. Vanuatu's immunization registry is built on DHIS2 to track and manage immunizations and to empower healthcare providers to quickly access and update patient immunization statuses, ensuring that no one misses critical vaccines, regardless of where they seek care. Additionally, the registry will support the Ministry in strengthening vaccine supply planning, identifying coverage gaps, and effectively coordinating vaccination campaigns.

23 At the time this Strategy is being drafted, the PAC system is being upgraded.

Therefore, under the New Strategy, rolling out the NEIR will unfold as follows:

a. **Accelerate NEIR design and implementation.** To accelerate the design and implementation of the National Electronic Immunization Registry (NEIR), the project is structured to prioritize high-impact, foundational activities and leverage the *WHO Pacific Immunization Reference Data Model* to fast-track the requirements gathering process and streamline design and development. This model, endorsed by WHO for Pacific Island countries, provides standardized data elements and workflows, significantly reducing the time needed for custom development and ensuring alignment with best practices. By adopting this framework, the NEIR project can shorten the development cycle by an estimated 50%, allowing the Ministry of Health to focus on key functionalities like individual registration, vaccination tracking, planning, and integration with external systems such as the national civil registry and VEMIS to mark the completion of Phase One which is scheduled for August 2025. Integration to the supply chain will be deferred to Phase Two after completing the national supply chain strategy and upgrading the mSupply system [Strategic Action 5.6].

b. **Pilot NEIR in select provinces.** The NEIR system pilot will be launched in SHEFA and MALAMPA provinces. During this phase, each pilot site will be equipped with the necessary hardware, software, and connectivity (aligned with Strategic Action 5.5a). Feedback mechanisms will be established throughout the pilot to facilitate targeted improvements to the NEIR, including interface adjustments, workflow optimizations for immunizations, and potential feature enhancements. Regular user training will be conducted on the DHIS2 Training Region, complemented by the development of tailored training materials to ensure user proficiency. The pilot is anticipated to conclude by December 31, 2025.

c. **Rollout NEIR nationally.** Following the completion of the pilot, the NEIR rollout will begin on January 1, 2026, using a phased, province-by-province approach, incrementally extending to each health facility. This phased rollout will allow for continuous refinement of the deployment process, addressing challenges and ensuring the NEIR operates smoothly at each stage before advancing to the next province or group of facilities.

3.2. Implement a National Electronic Health Record System (NEHR)

After spending the past decade on digitalizing its public health systems, the Ministry is now set to focus its digital health program to support clinical services delivery. The implementation of a national electronic health record system (NEHR) is a cornerstone initiative designed to unify patient health information across Vanuatu. It will replace the current version of the Patient Information System[24] at Vila Central, Northern Provincial, and Lenakel hospitals. The NEHR will provide healthcare providers access to patient histories at all hospitals (and select health centers), enabling continuity of care regardless of where patients are treated, thereby enhancing clinical decision-making, improving patient safety, and increasing efficiency in clinical services.

24 The Patient Information System (PIS) is an admissions, discharge and transfer patient system built on Microsoft Access. Used only for inpatients, it manages and tracks patient movement within a healthcare facility using a Patient Information Number (PIN). Because a patient may be assigned multiple PINs, there are several patient duplications and difficult to reliably track patient history and encounters. Furthermore, the PIS is not being used consistently, and all patient records are still recorded on paper. The Patient Information System was also impacted by the November 2022 government cyberattack incident.

Therefore, under the New Strategy, the implementation of the NEHR will unfold as follows:

a. **Develop NEHR clinical and technical requirements.** A comprehensive gathering of clinical, technical, and operational requirements will be completed in 2025. This includes identifying a list of functionalities needed to manage patient care, and a comprehensive understanding and mapping of clinical workflows across each hospital and other healthcare settings to help design and streamline clinical processes and improve data entry access efficiently. User design and usability considerations will be prioritized to ensure high adoption rates amongst users. Requirements for pharmacy management[25] and data analytics capabilities, such as support for clinical decision-making tools and reporting functionalities will be identified.

b. **Clean, cull, and reorganize patient medical records.** The transition to a National Electronic Health Record (NEHR) system requires a thorough and organized approach to handling existing patient records. Before migrating to a new NEHR, it is essential to clean, cull, and reorganize the vast volume of paper-based and legacy electronic records currently in use. This step, scheduled for 2025, is critical to ensure that only relevant, accurate, and updated patient information is migrated into the new system, reducing unnecessary data clutter and enhancing the usability of the NEHR. Together with [Strategic Action 1.3] to digitally archive records, it is expected that this initiative would also free up the much-needed space at the hospitals prior to the NEHR implementation.

c. **Determine feasibility of modernizing existing Patient Information System.** Conducting a feasibility study to determine whether the existing Patient Information System (PIS), developed by DCDT, can be modernized, based on clinical and technical requirements gathered in [Strategic Action 3.2a], is a prudent and necessary step given Vanuatu's human resources and financial constraints. Implementing a new electronic health record (EHR) system from scratch would demand substantial clinical and technical resources, potentially placing undue strain on the already limited healthcare workforce. The current PIS already has a significant footprint, especially at VCH, meaning that clinicians and IT personnel (from DCDT) are familiar with its interface, workflows, and most importantly, its limitations. Leveraging this existing system, if feasible, could offer a smoother transition toward the goal of providing access to patient records anytime/ anywhere, while reducing costs and minimizing the operational disruptions typically associated with a complete overhaul. This feasibility study will focus on thoroughly assessing the PIS' current capabilities, identifying functional and technical gaps, and determining whether targeted upgrades—such as improved interoperability using HL7 FHIR, enhanced data security, and updated functionalities—could meet the Ministry's digital health goals. By exploring the potential of the existing system, the Ministry can make an informed, resource-efficient decision that balances the need for a robust digital health system with practical considerations around workforce capacity and budgetary limitations.

25 Depending on the system's capabilities, drug ordering, prescribing, and dispensing—including drug interaction checks—will be managed either within the NEHR or mSupply. A separate pharmacy management application will not be implemented.

d. **Establish and action NEHR acquisition strategy.** The Ministry will explore tailored strategies with a goal for rapid deployment at VCH by early 2027.[26] Strategies includes: (1) adopting the electronic health record system from Tonga under a South-South Digital Health Cooperation Agreement, (2) going to a competitive tender process, or (3) modernizing the current Patient Information System (PIS).

e. **Implement NEHR.** A gradual rollout is envisioned, starting with VCH. This will allow the Ministry to identify and address any operational challenges before expanding the rollout to other hospitals and potentially health centers.

3.3. Introduce Telepathology and National Laboratory Information System (NLIS)

This strategic action aims to enhance diagnostic capacity and streamline laboratory workflows by introducing telepathology for remote pathology consultations and a National Laboratory Information System (NLIS) to improve data management, efficiency, and integration across the healthcare system.

Telepathology will directly address the chronic shortage of pathologists in Vanuatu by enabling remote consultations with regional and international pathology experts. By digitizing and transmitting laboratory samples, it eliminates the need for time-consuming and costly processes of packing and shipping specimens overseas for analysis. This ensures rapid diagnosis, allowing healthcare providers to initiate timely and accurate treatments, improving patient outcomes and reducing delays in critical care.

The introduction of a National Laboratory Information System (NLIS) will enable Vanuatu's healthcare facilities to manage and track laboratory data with precision, ensuring that lab results are readily available to clinicians and securely integrated into patient records. By centralizing laboratory operations and streamlining test result workflows, the NLIS will reduce delays in diagnostics and enhance the accuracy and accessibility of lab information. Additionally, an NLIS will strengthen public health surveillance by automating lab analysis and supporting timely confirmation of diseases during case investigations on both DHIS2 and Go.Data systems, facilitating faster and more accurate response to outbreaks.

Therefore, under the New Strategy, the implementation of telepathology and NLIS will unfold as follows:

a. **Develop telepathology and NLIS clinical and technical requirements.** To establish the detailed clinical, functional, and technical and functional requirements for a telepathology solution and NLIS. Telepathology capabilities will be implemented ahead of the NLIS to facilitate remote pathology consultations between the laboratory and pathologists to improve clinical outcomes and diagnostic turnaround times. Clinical requirements for an NLIS will range from sample management, test ordering and results reporting, results verification and validation, quality control and assurance, and epidemiology and surveillance. During this period, the Ministry will work with development partners to forge partnerships with external providers that can assess telepathology results.

b. **Acquire telepathology solution.** Following the Vanuatu Government procurement guidelines, develop a comprehensive Request for Proposal (RFP) that includes the telepathology clinical and technical requirements for competitive bidding to identify and evaluate suitable vendors.

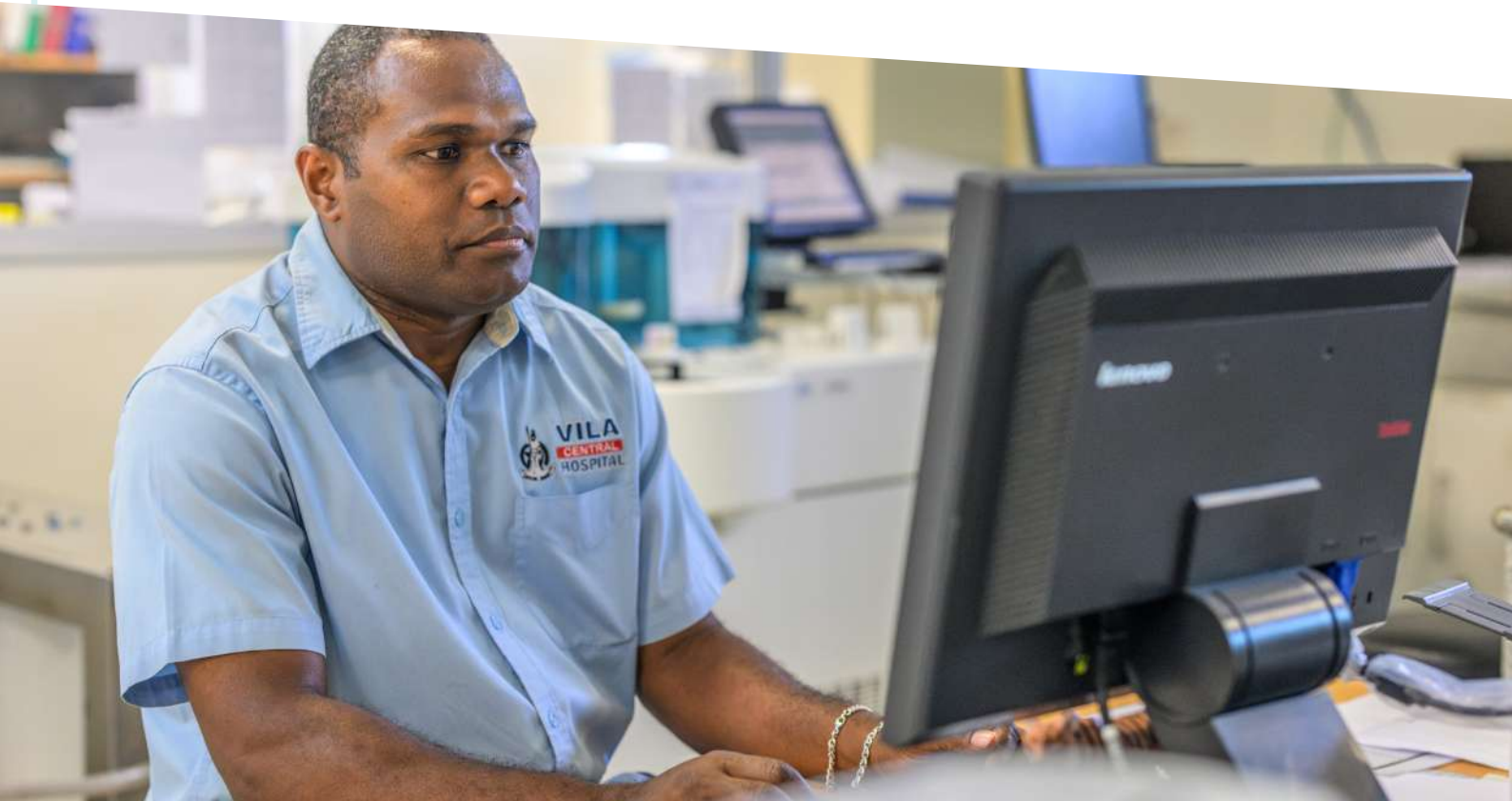
26 The plan is to implement the NEHR first at VCH and follow a scale up plan to roll out at other hospitals.

c. **Implement telepathology.** By leveraging digital imaging and telecommunications, this initiative will connect primary healthcare providers with pathologists and specialists, enhancing early detection, treatment, and patient outcomes. Telepathology will strengthen the integration of diagnostic services into the broader health system, promoting equitable access to high-quality care nationwide. The telepathology will operate independently ahead of the NLIS and will be integrated as part of the NLIS workflow.

d. **Acquire NLIS.** Following the Vanuatu Government procurement guidelines, develop a comprehensive Request for Proposal (RFP) that includes the NLIS clinical and technical requirements for competitive bidding to identify and evaluate suitable vendors.

e. **Implement and integrate NLIS with NEHR.** The integration will create a unified data ecosystem that allows lab results to automatically populate patient records in real time. This integration reduces delays in accessing critical diagnostic information, minimizes manual data entry errors, and ensures that clinicians have immediate access to lab data as part of a patient's comprehensive health history. It is also a strategy to help increase the adoption and use of the NEHR.

f. **Integrate NLIS with Go.Data and DHIS2**. The integration with Go.Data and DHIS2 (for malaria only) is essential for strengthening Vanuatu's public health response and outbreak management capabilities. The Ministry will be able to streamline the flow of laboratory-confirmed case data into epidemiological and case investigation workflows, enabling real-time surveillance and more efficient tracking of infectious diseases. With lab-confirmed cases automatically available to public health teams, the integration allows for more streamlined case investigation and contact tracing. Furthermore, the integration will reduce manual data entry (as it is currently being done today), enhances data accuracy since data does not need to be transcribed manually, and supports rapid, coordinated responses to emerging public health threats by generating and providing timely laboratory results.



3.4. Deploy a National Radiology Information System (NRIS)

The RIS will enable Vanuatu's healthcare facilities to manage, access, and share radiology data more effectively, enhancing the quality and efficiency of the country's diagnostic imaging services. By digitizing and centralizing radiology workflows, the NRIS will streamline scheduling, image storage, and reporting processes, making critical radiology information readily accessible to clinicians as part of each patient's health record.

Therefore, under the New Strategy, the implementation of the NRIS will unfold as follows:

a. **Assess and evaluate existing PACS.** This includes a comprehensive evaluation of the existing Voyageur PACS to determine its capacity, functionality, and limitations. The assessment will include analyzing data storage capacity, network performance, image resolution, and the user experience.

b. **Define clinical and technical requirements for NRIS.** Collaborate with radiologists and clinicians to gather detailed requirements that align with expected clinical workflows and technical standards. Define the system's capabilities, including image storage, retrieval, and secure access, as well as reporting needs. Ensure interoperability requirements align with standards like DICOM for images and HL7 or FHIR for data exchange with the NEHR, facilitating smooth integration. Develop an integration strategy to link the RIS with the existing PACS. This includes configuring protocols for data exchange, defining workflows for image capture and reporting, enabling secure access to images and reports, defining mechanisms to enable radiology orders from the NRIS to be processed in PACS and to route finalized images and reports back to the RIS, ensuring streamlined workflows between the two systems.

c. **Acquire NRIS.** Following the Vanuatu Government procurement guidelines, develop a comprehensive Request for Proposal (RFP) that includes the NRIS clinical and technical requirements for competitive bidding to identify and evaluate suitable vendors.

d. **Implement and Integrate NRIS with NEHR.** Integrating the NRIS and the NEHR system will create a fully interconnected environment, where imaging data and diagnostic reports are seamlessly linked to patient records. This unified access empowers healthcare providers to make faster, better-informed decisions, ensuring that radiology data enhances continuity of care and supports comprehensive, coordinated patient management across the country.

Pillar 4

Building Climate Resilient Health Systems

As one of the most disaster-prone nations in the world[27], Vanuatu faces unique and significant challenges at the intersection of health and climate change. Rising global temperatures, unpredictable weather patterns, and more frequent extreme weather events—such as cyclones, flooding, and droughts—have far-reaching impacts on public health. These environmental stressors exacerbate existing vulnerabilities, particularly in remote and underserved communities, by disrupting healthcare services, increasing the prevalence of climate-sensitive diseases, and straining already limited resources. Building a climate-resilient health system is no longer optional; it is an imperative to safeguard the health of Vanuatu's population in the face of a rapidly changing climate.

For the first time in Vanuatu's digital health strategies, this pillar focuses on equipping Vanuatu's health system to anticipate, withstand, and respond to the adverse effects of climate change. By addressing environmental health risks, strengthening health emergency and disaster preparedness, and developing early warning systems for climate-sensitive diseases, this strategy aims to embed resilience into every facet of the healthcare system. A climate-resilient health system is one that can ensure continuity of care during disasters, minimize health impacts of environmental shocks, and proactively address emerging threats such as vector-borne and waterborne diseases.

This pillar emphasizes and prioritizes the development of early warning systems for climate-sensitive diseases, such as malaria and dengue, which are projected to increase in frequency and geographic range due to rising temperatures and changing precipitation patterns. These systems, powered by real-time surveillance data and predictive analytics and eventually AI [Strategic Action 5.7c], will enable timely interventions to prevent outbreaks and protect communities at risk.

Also under this pillar, the introduction of environmental health management and monitoring is particularly critical which focuses on managing and monitoring environmental performance (e.g., pollution, waste, and resource use).Poor water quality, inadequate sanitation, and improper waste management—issues exacerbated by climate change—create fertile conditions for disease outbreaks.

Finally, strengthening Vanuatu's health emergency and disaster risk management capacities further complements these efforts, ensuring that the country is prepared to respond rapidly to health crises triggered by climate events.

27 https://bit.ly/4hXR7mH

Together, these initiatives form the foundation for a climate-resilient health system capable of protecting lives and improving health outcomes in an uncertain future.

Therefore, under Pillar 4, there are three key tactical initiatives:

4.1. Develop early warning system for climate-sensitive diseases

4.2. Improve health emergency and disaster risk management

4.3. Implement an Environmental Management and Monitoring System (EMMS)

4.1. Develop an early warning systems for climate sensitive diseases

Vanuatu faces significant vulnerability to climate change, marked by rising temperatures, erratic rainfall patterns, and increasingly severe natural disasters, all of which have a direct and profound impact on public health. The prevalence of climate-sensitive diseases such as dengue fever, malaria, and diarrheal diseases has escalated due to these environmental changes, often exacerbated by flooding, stagnant water, and disrupted sanitation systems.[28] As climate extremes become the norm, the need for a proactive, data-driven approach to health protection is no longer optional—it is imperative.

To address these growing threats, this strategy proposes the development of an Early Warning System (EWS) for Climate-Sensitive Diseases. By leveraging digital health platforms, meteorological data, and advanced analytics, (and eventually AI), this system will enable health authorities to predict disease outbreaks, allocate resources effectively, and communicate timely warnings to communities. The integration of real-time environmental monitoring and health surveillance will form the backbone of this initiative, ensuring that decisions are informed, rapid, and focused on prevention. It is a step forward in ensuring that the health impacts of climate change are managed proactively, protecting the most vulnerable and strengthening Vanuatu's capacity to adapt.

Therefore, under the New Strategy, the implementation of the early warning systems for climate sensitive diseases will unfold as follows:

a. **Design the Early Warning Systems (EWS) framework.** To begin, the Ministry will define the objectives, scope, and needs of the health sector in collaboration with the Department of Vanuatu Meteorology and Geohazards (VMGD), other government agencies, and development partners. Together, the Ministry will develop an Early Warning System (EWS) framework encompassing risk models, thresholds, alert mechanisms, and geospatial data to identify hotspots and map disease spread. This framework will serve as a foundation for identifying gaps in data—spanning health, environmental, and meteorological domains—as well as technology and capacity requirements for effective EWS implementation.

b. **Implement digital platform for climate and health data.** Given that the Ministry already uses DHIS2 for health data management, the Ministry will explore the implementation of the DHIS2 Climate Module.[29] It offers a practical starting point for integrating climate and health data. This approach will position the Ministry to streamline data collection, visualization, and reporting while enabling the Ministry to expand its capabilities with additional predictive tools and alert mechanisms in the future. At the time this Strategy is being written, the current DHIS2 Climate module does not have the capabilities of an early warning system.

c. **Implement EWS for climate sensitive diseases.** Implementing the Early Warning System (EWS) for climate-sensitive diseases requires leveraging existing systems and building on proven platforms to ensure efficiency and sustainability.

28 https://bit.ly/3Cy3Zjv

29 https://bit.ly/3APgtCK

Together with [Strategic Action 5.7c - AI for disease surveillance and outbreak prediction], the Ministry will explore the use of AI and machine learning technologies that will work with the DHIS2 Climate module to generate early warning predictions. Architecturally, it is expected that other software solutions will need to be implemented and integrated such as AI, workflow, communication, and engagement tools.

4.2. Improve health emergency and disaster risk management

Vanuatu's health sector operates in a dynamic and high-risk environment where natural disasters such as cyclones, earthquakes, tsunamis, and volcanic eruptions pose constant threats to public health. These events not only disrupt healthcare services but also exacerbate existing vulnerabilities by increasing the spread of communicable diseases, limiting access to essential care, and straining already fragile health systems. To address these challenges, there is a pressing need to strengthen the sector's capacity to prepare, respond, and recover from health emergencies and disasters in an integrated and systematic manner.

This Strategy recognizes that effective disaster risk management in the health sector hinges on the ability to harness digital tools to enhance coordination, streamline data sharing, and ensure real-time communication across all levels of the health system. By leveraging digital platforms, health authorities can plan proactively, respond rapidly to emergencies, and facilitate post-disaster recovery efforts with greater precision and efficiency. These tools can support activities such as early warning dissemination, post disaster needs assessment, emergency resource tracking, and monitoring of health outcomes during and after disasters.

Moreover, improving health emergency and disaster risk management aligns closely with global and regional priorities, such as the Sendai Framework for Disaster Risk Reduction[30] and the Sustainable Development Goals. By integrating these priorities into digital health initiatives, Vanuatu can position itself as a regional leader in climate-resilient health systems, ensuring that its population remains protected even in the face of increasing environmental and health-related threats. This section of the strategy outlines actionable steps to digitize and enhance disaster preparedness, response, and recovery efforts, reinforcing the resilience of the health system while safeguarding lives and livelihoods.

Therefore, under the New Strategy, improving health emergency and disaster risk management will unfold as follows:

a. **Standardize disaster response data collection and reporting.** To strengthen disaster response efforts, the current processes of data collection and reporting must be streamlined and standardized before introducing further investments in digital tools and automation. At present, various forms and platforms, such as Kobo Collect, Google Forms, and others, are used inconsistently by different stakeholders, all working towards the shared goal of gathering data from disaster-affected areas. This lack of uniformity has led to inefficiencies, particularly during cyclone season, where unclear coordination and fragmented processes hinder the generation of timely and actionable insights. To address these challenges, a business process simplification exercise will be undertaken to standardize data collection workflows, harmonize forms, and create a unified reporting process. This will include defining shared indicators and metrics to establish a common understanding of the data needed, its collection methods, and how it will be measured. By eliminating duplication and ensuring data completeness, this initiative will

30 The Sendai Framework for Disaster Risk Reduction (SFDRR) is a global agreement adopted by the United Nations in March 2015 at the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan. It provides a comprehensive blueprint for reducing disaster risks and building resilience to natural and man-made hazards over the period 2015–2030.

enhance coordination and lay the groundwork for future automation and digital transformation in health emergencies management. With the recent regulatory approval of Starlink, dedicated Starlink devices will also be deployed for health emergency purposes.

b. **Develop requirements for HEMS.** Developing requirements for a HEMS is a critical step before investing in a health emergency management solution. This process involves identifying the key functionalities needed to support preparedness, response, and recovery efforts, while ensuring seamless integration with existing health systems. Under this initiative, the Ministry will also assess if other emergency management solutions used by other government agencies (e.g., NDMO) can be adopted by integrating the needs of the health sector.

c. **Implement HEMS.** Depending on the needs outline in [Strategic Action 4.2b] , the Ministry's Health Emergency Management System (HEMS) can be as simple as improving the current Google Form and Kobo Collect forms, piggybacking on other government emergency management solutions, or to introduce an enterprise-level suite of software that provide integrated incident reporting, resource tracking, team management, and post-incident analysis.

4.3. Implement environmental management and monitoring system (EMMS)

The scope of services provided by the Environmental Health, Health Standards and Inspection (EHHSI) unit focuses on safe water, sanitation and hygiene (WASH), food safety, waste management, occupational health and safety, public health emergencies and disasters, and ship inspection.

Despite these broad mandates, the current state of the unit still heavily relies on manual processes, with limited use of digital tools such as the use of standalone Excel spreadsheets for data management. These approaches fall short, reducing efficiency, accuracy, and responsiveness in managing and addressing environmental risks that have a direct impact on public health. Furthermore, the level of digital readiness and maturity at the EHHSI Unit is relatively low due to the lack of automation in this area and with limited personnel.

Therefore, under the New Strategy, implementing an Environmental Management and Monitoring system (EMMS) will unfold as follows:

a. **Develop requirements EMMS.** Developing requirements for an Environmental Management and Monitoring System is essential to enhance the health sector's ability to monitor, manage, and respond to environmental risks impacting public health. This process will define the critical features needed for effective tracking of water quality, waste management, and other environmental health indicators while ensuring integration with existing health and environmental systems.

b. **Implement EMMS.** Implementing an Environmental Management and Monitoring System is a pivotal step toward enhancing environmental health and its integration with public health systems both at the national and provincial levels. Focused on simplicity, this system will provide a comprehensive platform for monitoring key indicators such as water quality, waste management, and pollution levels, ensuring timely data for evidence-based decision-making. The implementation process will involve broad consultation with key stakeholders, including all Provincial Health offices, the Ministry of Climate Change, namely the Department of Environmental Protection and Conservation, the Department of Local Authorities, area councils, the municipal councils of Port Vila and Luganville, and relevant community representatives.

Pillar 5

Strengthening Foundational Health

The effectiveness and sustainability of Vanuatu's digital health initiatives are contingent upon a solid foundation of critical infrastructure - which underpins every aspect of digital health services delivery. “Foundational infrastructures” in this Strategy refer to the essentials system, frameworks, and resources that form the backbone of the digital health ecosystem. It ensures that digital health initiatives are sustainable, secure, and scalable, enabling the effective delivery of health services, the efficient management of scarce resources, and the seamless exchange of health information across the healthcare system.

Past digital health strategies have fallen considerably short since these “foundational infrastructures” have not been adequately addressed. A review of past strategies has highlighted gaps in the foundation that, if unaddressed, will continue to hinder progress towards universal health coverage, efficient data management, and resilient healthcare systems. Upon review of what has been achieved in the *Vanuatu Digital Health Strategy 2019–2021*, the consequences of not achieving 84% of its commitments would not be as drastic if what has been achieved was squarely focused on completing the foundational activities such as improving the human and organizational capacity, providing the proper infrastructure, and ensuring compliance to interoperability standards. As a result, *the lack of progress against key objectives in these areas has limited the rate of progress in other areas in the Vanuatu Digital Health Strategy 2019–2021.*

Furthermore, strengthening governance structures for digital health is a cornerstone of this strategy – in alignment with WHO’s[31] emphasis on robust governance as an enabler for digital health adoption globally. This includes ensuring policy coherence, fostering collaboration across sectors, and adhering to international standards for health information systems

Therefore, this strategic pillar focuses on closing these gaps to not only maintain steady state operations, but to enable the health sector to evolve in response to new challenges and innovations.

31 WHO Global Strategy on Digital Health

Therefore, under Pillar 5, there are seven key tactical initiatives:

5.1. Invest in Human Capital

5.2. Improve Digital Governance

5.3. Develop Legal and Regulatory framework

5.4. Adopt Interoperability Standards

5.5. Improve IT and Network Infrastructure

5.6. Strengthen Supply Chain Management

5.7. Embrace Artificial Intelligence

Together, these components form the bedrock for the Ministry to keep the health sector digitally operational (i.e., to run the ministry), and to adapt to future technological advancements and emerging healthcare needs (i.e., to grow and transform the ministry).

5.1. Invest in Human Capital

Domain knowledge, technical expertise, and digital literacy are crucial in any digital environment. As such, human and organizational capacity should be regarded as the cornerstone upon which the Ministry can define, refine, and reinforce its success strategies. This Strategy proposes restructuring the current HIS and IT units into a unified Digital Health unit, re-evaluating job positions to ensure competitive market-based compensation, offering ongoing training opportunities for all staff, enhancing digital literacy across the health sector, and putting in place an official healthcare provider registry

The highest priority is to ensure the digital health organizational structure is in place to carry out this Strategy. Currently, several key vacancies remain unfilled in both the HIS and IT Units, hindering progress for the following reasons:

- *Lack of competitive compensation package to attract, recruit and retain talent.* The HIS and IT positions' compensation structure falls under the Public Service Commission (PSC) salary band structure. It does not consider the unique skills premium that accompany those that work in these fields and the overall labor market competitiveness for highly skilled IT workers within a small talent pool such as in Vanuatu.
- *Contract management issues.* Most Provincial HIS Officer positions are on a one year rolling contract. However, it takes months and sometimes years, before these positions are filled. Consequently, provincial user support and monthly health facilities reporting coverage are negatively impacted.
- *Pay disparity across ministries.* Although in theory, information officers and IT officers should be paid the same regardless of ministries, health information and IT officers appear to be paid at a lower salary band for similar type of work making it difficult to recruit from other sectors. In several cases, HIS officers have been expected to take on secretarial duties.
- *Inadequate staffing budget.* The annual budget of salaries has never caught up to what the national and provincial HIS and IT units needs to hire highly qualified and permanent full-time equivalents to fill its vacancies. Therefore, both units are made predominantly of a tactical workforce that are volunteers, funded by development partners, project-based, and recruited on short-term contracts. Staff are also compensated below market and fall short in offering staff with essential training and development in health information management, innovation, and technology. In most cases, those who are hired are immediately looking for a permanent position somewhere else in and outside of the Ministry.
- *Lack of identifiable career path.* The polarity between a typical government healthcare professional and a digital health professional is quite distinct. A typical digital health employee, particularly an IT professional, seek out a defined career path that will continue to develop their technical skill sets to keep them current and marketable. In most cases, understanding the business of healthcare is secondary.

Since IT is not core to the Ministry's business, the career path of an IT professional is limited. On the other hand, the career path of a health information officer such as those in HIS have more permanence but will still need career mobility upwards just like any health positions.

- *Lack of sustainable training plan.* The training budget for both HIS and IT units are severely limited and only the most senior staff and management cadre can attend formal training courses.

The bottom-line is that the environment and foundation to carry out this Strategy has not been created.

Therefore, under the New Strategy, investing in human capital will unfold as follows:

a. **Reorganize HIS and IT into a single Digital Health unit.** The HIS and IT units will be restructured under a single Digital Health unit reporting to the Corporate, Services and Planning Division. Recognizing the time it will take to implement the proposed Digital Health organization structure, work has already started in 2024 and will continue well into 2025.

   The new Digital Health unit will be structured along core competency requirements to match the digital health activities cycle of *Plan–Build–Support*.

Digital Health Cycle Category	Core competency area addressed
1. Plan (Think)	1. Strategy (External) 2. Policy development (External) 3. Architecture (External) 4. Project management 5. Information management
2. Build (Integrate)	1. Business analysis and domain expert 2. Requirements management 3. Product management (except programming) 4. Vendor management 5. User management 6. Test management
3. Support (Run)	1. System administration 2. User security administration 3. Desktop and infrastructure administration 4. Network administration 5. Health information support (National, Provincial, and Hospital) 6. Hospital records management

The proposed new Digital Health Structure is shown on Appendix B.

b. **Conduct job re-evaluation of positions.** Before starting recruitment, it is important to address the issue of pay disparity. New job descriptions will be developed for current and new positions, including a case for a new pay scale if appropriate. Each position package will be submitted to the PSC to evaluate and grade each position to reflect their updated value.

c. **Partner for targeted human capital assistance.** The Ministry will reach out to other government sectors such as DCDT, development partners such as the World Health Organization (WHO), peer learning networks such as the Pacific Health Information Network (PHIN), and volunteer groups to augment its human capital needs. Working collaboratively with DCDT and Vanuatu Institute of Technology (VIT), capacity building programs and technical workshops will be offered to the Digital Health team regularly when the opportunity arises. Development partners will provide technical assistance for highly specialized needs. The Digital Health team will proactively participate in peer learning networks and work with volunteer groups (e.g., AVI, JICA, Peace Corps, etc.) to augment capacity.

d. **Strengthen digital literacy across the health sector.** Strengthening digital literacy across the health sector is essential for maximizing the benefits of digital health technologies and ensuring their seamless integration into healthcare workflows. This strategic action aims to bridge the digital divide, empowering healthcare providers at all levels to confidently adopt and leverage technology for better patient outcomes. By equipping health workers with the knowledge and skills to effectively use digital tools, the Ministry can enhance service delivery, improve reporting and data management, and foster a culture of innovation. The Strategy recommends integrating digital literacy courses into the Vanuatu College of Nursing Education (VCNE) curriculum, collaborating with education-focused NGOs such as the Vanuatu Skills Partnership (VSP) program, incorporating digital literacy into new employee onboarding, and providing ongoing training for all healthcare workers. The Strategy also calls on reaching out to the University of the South Pacific (USP), the National University of Vanuatu (NUV), and the Vanuatu Institute of Technology (VIT), and other international medical schools such as the Fiji National University (FNU).

e. **Implement a Healthcare Provider Registry.** This registry will list all government recognized healthcare workers that are actively involved in the delivery of healthcare. The Healthcare Provider Registry will establish a centralized and up-to-date database of all healthcare professionals and private facilities across Vanuatu. This registry will enhance ongoing training, workforce planning, improve service delivery coordination, and ensure compliance with licensing and accreditation standards.

5.2. Improve Digital Governance

Digital governance is the linchpin that ensures the integrity, accountability, and sustainability of digital health initiatives. It is not simply about technology management. It is about establishing robust frameworks that guide decision making, align digital investments and scarce resources with strategic health goals, ensure that digital solutions are used effectively by healthcare workers, and that the digital health systems are responsive to the needs of the people while maintaining public trust.

The role of the Digital Health Steering Committee is to also monitor expenditure and to assist if budget fall short or exceed the compulsory 3 to 5% of annual budget.[32]

32 To cite an example, according to Government of Vanuatu policy, 3 to 5% of the ministry budget must be allocated to ICT. Current budget is approximately VT 2,000,000 between the HIS and IT Units – significantly lower than the 5% target.

Currently, the Ministry has a Digital Health Steering Committee. However, the committee has been clinically led and have not been meeting regularly. The strategic actions identified under the new Strategy is to strengthen digital governance by including members of the MOH Leadership Team, focusing on reinforcing alignment and coordination between MOH divisions and provincial health authorities, fostering collaboration with DCDT, standardizing data practices within HIS and across clinical and public health programs, and ensuring strong adoption of digital health investments. Therefore, under the New Strategy, governance of digital health initiatives will unfold as follows:

a. **Introduce new Digital Health Steering Committee structur**e. The new structure will be chaired by the Director General and will make the final decision. Steering Committee members will include representatives from the Curative Services, Public Health, and the Policy, Planning, and Corporate Services divisions. The Digital Health Manager will continue to play the role of the Secretariat. The DHSC will provide strategic direction, oversee digital health initiatives, and ensure alignment with broader health system goals.

b. **Introduce Digital Health subcommittees.** Subcommittees will play an important role with a specialized focus. Depending on the mandate, the role of each subcommittee is to focus on key areas critical to the Ministry. Two initial subcommittees to be formed are as follows:

Subcommittees	Purpose	Members
1. Data and Program Management Subcommittee (DPMS)	To guide the management and use of health information to ensure accuracy, accessibility, standardization (e.g. denominators, estimation, meta data, etc.) and alignment between all programs and departments.	• Director of Public Health (or delegate) as Chairperson. • All public health and clinical departments, including provincial health managers and program managers • Information Management Officers and Business Analysts.
2. Technical Management Subcommittee (TMS)	Established as the highest-level governance body overseeing the Ministry's technology deployment, this Committee is responsible for setting technical standards and ensuring the integrity, security, interoperability, and efficient utilization of the digital health infrastructure.	• Director, Policy, Planning, and Corporate Services as Chairperson. • Representatives from DCDT • Digital Health Manager and members of the Systems and Infrastructure team.
3. Project Steering Committee (PSC)	Setup for each digital health project, this Committee is to provide strategic oversight and decision-making to ensure the project aligns with national goals, stays on track, and delivers its intended outcomes.	• Digital Health Manager as Chairperson. • The composition of the Project Steering Committee is dependent on the nature and scope of the project, with members selected based on their relevance, expertise, and stakeholder representation.

5.3. Develop Legal and Regulatory Framework

Despite the Ministry of Health's unwavering commitment to digitizing health systems and transforming health service delivery in Vanuatu, there is currently a critical gap: no laws or policies exist to govern, protect, or standardize digital health initiatives.

As digital health becomes central to improving accessibility, efficiency, and quality of care, a robust legal and regulatory framework is essential to guide this transformation. The absence of foundational legislation and policy presents significant challenges, from legislating the National Health Number to ensuring patient data privacy. The new Strategy seeks to address these challenges by prioritizing the development of comprehensive legal and policy frameworks that will safeguard data security, ensure patient rights, and facilitate the effective deployment of digital solutions within the health sector.

Therefore, under the New Strategy, the establishment of foundational will unfold by introducing seven regulatory reforms:

a. **Expand health specific guidelines under the Vanuatu Data Protection Act.** While the Act lays a solid foundation for general data protection, it does not cover the specific needs of a digital health legal framework particularly in the areas of health data management, legal recognition of digital records as evidence for judicial use, specific patient rights, clinical data sharing, and security standards. This includes providing regulations around linking of biometrics from the civil registry to health-specific data to ensure patient privacy and to strengthen overall management of data sensitivity in health contexts. MOH will work with the State Law Office and DCDT.

b. **Establish a Health Information Retention and Disposal Policy.** Currently there is no clear guideline on how long patient medical records need to be kept. Under the Vanuatu National Library and Archive's Vanuatu Code of Practice, under Section 10.2 states that "*records should be kept for as long as they are needed by the government agency or relevant private entity*", which in turn, indicates that the Ministry will define its useful span. In the meantime, health facilities – namely hospitals are running out of storage room to store patient records, diagnostic reports (e.g., X-rays, ultrasound, pathology, etc.), and administrative records (e.g., admission and discharge forms, etc.). The new Policy will serve to provide guidelines on retention (i.e., defining how long health records must be kept), storage (i.e., setting standards for secure storage of health information, both in physical and electronic formats), and disposal (i.e., establishing secure and compliant methods for the destruction of health information when it is no longer needed, including protocols for both digital and physical records.

c. **Introduce Telemedicine and Remote Health Services Policy.** In support of the People's Plan by improving healthcare accessibility, particularly in rural areas, and in alignment with the Decentralization Policy to support regional health services, develop an enabling policy to provision the use of telemedicine to support remote health services. This includes prescribing for pharmaceutical arrangements and e-referral. Key provisions of this policy include training and certification of healthcare providers in the proper use of telemedicine. It also defines service quality standards. Additionally, it outlines patient rights and the obligations of service providers.

d. **Institute a Digital Health Workforce Development Policy.** In alignment with the H*ealth Sector Strategy* of capacity building and the *People's Plan* for creating a knowledgeable workforce, it is important to develop and sustain a digitally skilled health workforce capable of supporting digital health initiatives. This includes setting the minimum training standards for health information and IT staff and putting in place a continuous professional development program. Healthcare workers in general will also be trained to encourage regular upskilling in the use of computers and applications. New nurses' orientation and training, through VCNE, will also be part of the scope of the development policy.

e. **Establish a Health Data Sharing and Access Policy.** The Ministry continue to receive numerous requests from development partners and external agencies for program planning, program valuation and global health reporting and benchmarking. The Ministry will put in place a policy that supports external data requests by outlining the terms, conditions, the procedures for sharing health data with external entities ensuring they comply with privacy and security standards, protect patient confidentiality, and define authorized uses and limitations of the shared data.

f. **Establish a Public Health and Research Governance Policy.** While the Data Protection Act does not cover special categories of data and restricts the processing of data without consent, it allows some flexibility for public interest and research purposes. Working with the Vanuatu National Health Research and Ethics Committee (VNHREC), a policy will be developed that have detailed provisions around de-identified data usage, data anonymization standards, and permissible public health research uses.

g. **Establish an AI Governance Policy for Healthcare.** Vanuatu is committed to adopting innovation such as AI to strengthen clinical services delivery and improve patient outcomes. The rapid advancements in artificial intelligence (AI) are transforming healthcare by improving diagnostic and enhancing treatment precision. However, the integration of AI into Vanuatu's healthcare system requires a robust policy framework to address critical challenges, including data privacy, algorithmic transparency, clinical integration, workforce development, and equitable access to AI-driven innovations. An effective AI policy for healthcare ensures that these technologies are used ethically, safely, and responsibly while fostering innovation to meet the sector's evolving needs. This policy is meant to set the foundation for leveraging AI to enhance patient outcomes and healthcare system efficiency while safeguarding public trust and mitigating risks. The Ministry will work collaboratively with DCDT.

5.4. Adopt Interoperability Standards

Adopting interoperability standards is vital for Vanuatu's healthcare system, as it allows seamless data sharing across health facilities, and ensuring that patient information is accessible wherever and whenever it is needed. By breaking down data silos, these standards empower healthcare providers with a full view of patient history, lab results, and treatment plans, ultimately enhancing clinical decision-making and patient outcomes. Reporting also becomes seamless between the clinical systems and the public health system, DHIS2. Interoperability also supports a responsive health system, allowing for coordinated efforts in routine care and during health emergencies. The new Strategy will focus mainly on two interoperability standards: messaging and terminology.

Consistent with the WHO's advocacy[33] for syntactic and semantic interoperability, Vanuatu's strategy emphasizes adopting standards. These standards are essential to achieving a connected health ecosystem where systems and data can seamlessly interact across care settings. *Messaging standards* like HL7,[34] FHIR[35] and DICOM[36] establish a unified framework for integrating diverse digital health platforms such as electronic health records, imaging systems, and laboratory information systems. These standards ensure that health information can be shared in a structured and consistent way, regardless of the digital platform to support interoperability across healthcare facilities. By allowing timely access to comprehensive patient data, messaging standards help improve clinical decision-making, patient outcomes, and operational efficiency in healthcare. Terminology standards such as ICD, SNOMED CT, and LOINC are essential because they provide a common language for accurately documenting, coding, and sharing health information. This standardization promotes consistent diagnoses and treatments. Furthermore, terminology standards allow for more reliable health data analysis ultimately improving patient care outcomes.

Interoperability standards safeguard the Ministry's digital health investments by promoting scalability and long-term adaptability. By aligning with standards, Vanuatu's digital health systems will be implemented to seamlessly integrate with future technologies, ensuring they remain effective and compatible as healthcare needs and technology evolve.

Therefore, under the New Strategy, the Ministry will adopt the following strategic action items:

a. **Adopt solutions that are HL7 and FHIR compliant.** In 2023, the Ministry has made it mandatory that all new digital health systems, such as the Heartcare NCD Management System and the Medical Disability Registry (i.e., MDR), must be HL7 and FHIR compliant. All future digital health systems must meet the minimum mandatory requirement to be HL7 FHIR compliant. This technical requirement will be reflected in all bidding documents for future acquisitions.
b. **Integrate standards with existing digital systems.** To protect investments made on legacy digital health systems, the Ministry will map between existing data structure and FHIR resources to define how information such as patient demographics and clinical data is to be formatted for interoperability.

33 WHO Global Strategy on Digital Health, p. 16 – Promote the appropriate use of digital technologies for health

34 Health Level Seven, abbreviated to HL7, is a range of global standards for the transfer of clinical and administrative health data between applications with the aim to improve patient outcomes and health system performance.

35 The Fast Healthcare Interoperability Resources (FHIR) standard is a set of rules and specifications for exchanging electronic health care data. It is designed to be flexible and adaptable, so that it can be used in a wide range of settings and with different health care information systems.

36 Digital Imaging and Communications in Medicine (DICOM) is a technical standard for the digital storage and transmission of medical images and related information.

c. **Leapfrog to ICD-11.** The Ministry is currently at ICD-10, but its use has been challenging and inconsistent primarily due to lack of inputs from clinical staff and qualified clinical coders. Adoption of ICD-10 has been fleeting. Therefore, the Ministry will be adopting ICD-11[37] and divest further investments in ICD-10 training for morbidity and mortality coding. ICD-11 is the latest health classification standard developed by WHO. Building on ICD-10, it introduces a digital-first structure, expanded code set, and enhanced integration capabilities with digital health systems, allowing for more accurate and detailed health information. It is designed to improve precision and interoperability in health data management as compared to ICD-10 which was primarily designed for paper-based use, with limited adaptability to digital systems. A significant feature of ICD-11 is the improved ease and accuracy of coding using digitization algorithms and AI, translating to the need for reduced qualified clinical coders, but highly trained to validate the AI results.

5.5. Improve IT and Network Infrastructure

Reliable infrastructure forms the backbone of digital health. Strengthening IT and network capabilities will support everything from accessing electronic health records and telemedicine to submission of routine monthly reports and public health surveillance. This infrastructure expansion is essential not only for daily healthcare operations but also for strengthening Vanuatu's health system resilience against disruptions, such as natural disasters and health emergencies. Therefore, a comprehensive approach to IT and network infrastructure improvement includes expanding high-speed internet access and optimizing the deployment of computer hardware across the health milieu.

Vanuatu currently faces significant infrastructure constraints, with only a single submarine cable serving the country and high costs associated with both terrestrial and satellite internet services. These challenges have hindered efforts to equip many health facilities with reliable connectivity. Although some rural health facilities previously had VSATs installed, most have been deactivated due to prohibitive costs. However, with the regulatory approval of Starlink in August 2024 and an inexpensive alternative to VSATs, this situation is set to improve. Starlink's low Earth orbit (LEO) satellite technology offers portable high-speed, low-latency internet that can reach areas where traditional terrestrial and high-orbit satellite services fall short. This advancement means healthcare facilities across Vanuatu can now access dependable internet, helping to bridge the longstanding gaps caused by limited undersea cables and local infrastructure deficiencies.

Investing in IT and network infrastructure will position Vanuatu's health system, allowing it to scale with growing data demands and adapt to emerging digital health technologies. This commitment to digital readiness will play a crucial role in Vanuatu's journey toward a more accessible, efficient, and resilient health system that serves all citizens.

Therefore, under the New Strategy, the Ministry will adopt the following strategic action items to improve the health sector's IT and network infrastructure.

a. **Deploy Starlink across hospitals, health centers and dispensaries.** With over 300 health facilities[38] across the country, deploying Starlink across health centers and dispensaries represents a transformative step in expanding reliable, high-speed internet access to Vanuatu's healthcare network. Health centers and dispensaries serve as critical points of care for communities, especially

37 ICD is fully electronic, currently providing access to 17 000 diagnostic categories, with over 100 000 medical diagnostic index terms. The index-based search algorithm interprets more than 1.6 million terms. https://icd.who.int/en/docs/icd11factsheet_en.pdf The ICD-11 transition will also depend on how far along DHIS2 and other Ministry's applications can capture and analyze the ICD-11 code strings.

38 As of November 2024, the exact number is 314. The breakdown are as follows: Hospitals (5), Health Centers (36), Dispensary (107), and Aid post (166).

in remote areas where traditional connectivity options are limited or unreliable. By equipping these facilities with Starlink's satellite internet, the Ministry can enhance communication, streamline data reporting, enable access to digital health resources, and ensure that essential services remain connected and accessible, even during disasters. Prior to acquiring Starlink, the Ministry will develop a deployment strategy starting with high priority facilities such as hospitals (for backup in case of disaster) and health centers. Dispensaries and aid posts will be included in subsequent phases. The deployment strategy will also prioritize allocating Starlink resources based on each facility's role, patient volume, usage patterns and connectivity need (e.g., the lack of alternative networks in the area). To save on costs, the deployment should also consider introducing portable Starlink units such as the Starlink Mini that can be rotated amongst aid posts as needed.

Given the unreliable power supply in many rural health facilities, solar solutions must be included in the total acquisition costs. Additionally, to ensure the sustainability of monthly operational expenses, the Ministry will explore monetizing these assets by offering Internet services to the community.

b. **Standardize hardware and software requirements.** Standardizing hardware and software requirements across health facilities is essential to create a cohesive, reliable, and easily maintainable digital infrastructure. This consistency simplifies technical support, ensures compatibility with digital health systems, and improves user experience. Currently, there are no standards in place. Working together with DCDT, the Ministry will publish a Preferred Operating Environment (i.e., "POE") that will guide the acquisition of any digital devices (i.e., computers, laptops, tablets, etc.). All development partners aiding to provide digital devices will also need to adhere to the new POE standards before they can be accepted.

c. **Deploy and refresh digital devices.** Working with the Asset Unit, a digital device audit will be conducted first to assess the condition, usage, location, and compliance status of each device to ensure they meet the organization's POE standards for security, performance, and compatibility. The audit will also help identify outdated or underutilized equipment to guide procurement and resource allocation. The Ministry will also plan for a replacement cycle every 5 years to ensure computers remain functional and up-to-date, especlally in high-use facilities like hospitals.

d. **Share infrastructure with area councils.** Since not all health facilities will have computers and connectivity, the Ministry will have an agreement with the Ministry of Internal Affairs where computers, network access, and other digital resources are accessible by healthcare worker staff. Since many area councils will also allow the community to use its resources, strict access protocols with role-based permissions will be implemented to ensure sensitive health and patient information remain secure.

5.6. Strengthen Asset and Supply Chain Management

By establishing a centralized digital registry of healthcare assets—including medical equipment, IT infrastructure, and health facilities—the Ministry will gain comprehensive visibility over its resources, enabling proactive maintenance, lifecycle management, and strategic decision-making. This system will address challenges such as equipment underutilization, misplacement, and delayed maintenance, which often lead to service disruptions and unnecessary expenditures. Furthermore, the asset registry will provide a snapshot of the current assets in place to support health services delivery and emergencies. Integrated with existing supply chain management processes in the future, the asset management system will ensure that healthcare workers have access to reliable, well-maintained equipment, supporting uninterrupted service delivery and improved health outcomes. Moreover, by fostering transparency and accountability in resource stewardship, this initiative aligns with the Ministry's broader goals of digital transformation and evidence-based governance.

A well-designed supply chain system not only improves healthcare delivery but also enables the Ministry to reduce operational costs significantly. Real-time inventory management, through a centralized system, allows for demand-driven ordering, which minimizes the risk of overstocking (leading to wasted resources from expired items) and understocking (resulting in costly emergency procurements). By analyzing real-time data on stock levels and usage patterns, the Ministry can make proactive, data-driven decisions that optimize resource allocation and reduce unnecessary expenses. A well-functioning supply chain not only delivers cost savings but also achieves cost avoidance, resulting in a faster payback period compared to other digital health investments.

Efficient logistics planning further enhances cost savings by enabling the Ministry to consolidate shipments and schedule deliveries based on facility needs. Additionally, a robust supply chain system can help balance inventory levels across facilities, ensuring that medications and supplies are available where they are most needed, minimizing waste and mitigating stockouts. For example, in cases where a dispensary experiences stockouts, the system can identify nearby health facilities with surplus stock that can be reallocated to support the shortage.

Therefore, under the New Strategy, the Ministry will adopt the following strategic action items to strengthen the health sector's supply chain:

a. **Implement a national asset registry.** The implementation of an asset registry is a critical initiative to enhance resource visibility, optimize allocation, and ensure the sustainability of healthcare services in Vanuatu. This strategic action focuses on developing a centralized, digital system to catalog and track all healthcare assets, including medical equipment, IT infrastructure, vehicles, and status and condition of assets across all health facilities. The registry will incorporate key details such as asset location, condition, utilization rates, maintenance schedules, and expected lifecycle, providing a comprehensive overview of resource availability and status across all healthcare facilities. By enabling real-time tracking and integration with existing supply chain systems, the asset registry will support proactive maintenance planning, timely replacements, and strategic decision-making.

b. **Develop a national supply chain strategy.** This strategy will outline the goals, detailed requirements, processes, and best practices for sourcing, storing, and distributing essential medicines, medical devices, and consumables to health facilities nationwide. The strategy will support data-driven inventory management, optimize logistics, and ensure that healthcare resources are accessible to all communities. The strategy will also guide the design and configuration of the supply chain solution, to enable real-time inventory tracking, streamline logistics, and allow for stock distribution and consumption tracking, stock

management, stock ordering and stock forecasting and procurement. A critical part of this strategy is to design a warehouse and distribution subsystem to help increase the efficiency of stock distribution across health facilities, potentially leading to increased value in procurement and decreased stock wastage and stock outs.

c. **Upgrade and configure mSupply.** The mSupply solution currently is sufficient to meet the needs of the Ministry. However, the software will require a major technical upgrade and reconfiguration, along with deployment of new digital devices (e.g., barcode scanners, computers, and tablets). With plans to optimize the supply chain using AI-based inventory forecasting around 2028, discussions will be held with the vendor on its product development plans to include AI capabilities.

5.7 Embrace Artificial Intelligence and Unmanned Aerial Vehicle (UAV) Technology

Embracing AI in the new digital health strategy aligns with Vanuatu's goals for universal health coverage and equitable access to healthcare, as outlined in the People's Plan and Health Sector Strategy. Artificial intelligence (AI) offers transformative potential to improve healthcare in Vanuatu. Faced with chronic shortages of clinical and public health workers, AI tools can automate routine tasks and support accurate diagnoses, thus improving service efficiency without requiring a significant increase in personnel. Furthermore, AI can also be used to improve develop early warning systems for climate-sensitive diseases by analyzing climate data alongside health data to identify patterns and predict outbreaks.

One of AI's most powerful applications is its ability to analyze vast amounts of health data quickly and accurately, assisting in everything from predictive analytics for disease outbreaks to clinical decision support for practitioners. For this reason alone, it is critical to start the digitalizing of patient records such as electronic health records, lab results, medical imaging, and clinical notes to be able to train or adapt the AI model to the specific context of Vanuatu's healthcare system.

AI's ability to enhance patient engagement and self-care practices is also crucial, particularly for preventive health. AI-driven mobile applications could help citizens manage chronic conditions, receive health alerts, and access personalized health advice. By bringing these tools into the community, the Ministry can empower individuals to take control of their health, thus reducing the long-term burden on healthcare facilities.

Unmanned aerial vehicles (UAVs), or drones, present an innovative solution to address Vanuatu's logistical challenges in healthcare delivery. Though drone technology has been evolving over the years with significant advancements in efficiency and reliability, earlier attempts to use drones for health transport in Vanuatu, such as the pilot in 2017[39], faced setbacks due to operational costs and logistical challenges, leading to the project's discontinuation.

Today, next-generation UAV technology offers enhanced capabilities (e.g., bigger payload capacity and longer-range drones) that can provide timely delivery of essential medicines, vaccines, lab samples, and medical equipment to Vanuatu's most remote and hard-to-reach areas. This advanced technology can support emergency response by enabling rapid delivery of life-saving supplies and conducting aerial assessments in the aftermath of natural disasters, when traditional infrastructure is often compromised. By strategically incorporating UAVs into the healthcare supply chain by the end of this decade, the Ministry of Health can significantly improve healthcare access, strengthen resilience, and promote equitable service delivery across all communities in Vanuatu.

Therefore, under the New Strategy, the Ministry will adopt the following prioritized strategic action items to embrace AI. It has been prioritized from the simplest and most impactful to more advanced

39 https://www.unicef.org/innovation/drones/technology-for-vaccine-delivery-vanuatu

options, considering resource limitations and the unique health needs of Vanuatu. Note that these action items are grounded in the current capabilities of AI, while acknowledging that advancements over the next 5 to 7 years may exceed expectations.

a. **Adopt AI for clinical support in hospitals and primary care.** To enhance clinical decision-making, responsible generative AI-driven tools will initially be implemented in hospitals, with plans to extend to select primary care facilities. These tools will provide healthcare providers with real-time medical insights, enabling timely, evidence-based care, especially in environments with limited specialist support. The integration of AI aims to supplement the capacity of the current, chronically understaffed medical workforce, allowing doctors to spend more quality time with patients, reinforce the clinical decision-making process, and improve patient outcomes. Additionally, introducing AI-powered clinical support is a natural entry point for introducing AI to build clinicians' familiarity and confidence in using more advanced AI solutions in the future.

b. **Medical chatbots for patient education and support.** A medical chatbot is an AI-powered tool that provide users with instant, interactive health information, guidance on symptoms, and answers to common medical questions, helping to support self-care and improve access to basic health services while at the same time increase the population's health literacy. Target implementation scope include preventative care guidance and for chronic disease management support such as for diabetic patients.

c. **AI for disease surveillance and outbreak prediction.** After laying the foundation and framework for a climate-sensitive disease early warning system [Strategic Action 4.1c] by Q1 2028, an AI-powered predictive analytics for disease surveillance will be implemented to automate anticipation and management of disease outbreaks and targeted interventions by leveraging climate, health, and geographic data to enable proactive responses.

d. **AI for image-based diagnostics.** To address the ongoing shortage of specialists in the country, the Ministry will leverage the power of AI to analyze basic medical images such as for dermatology for skin conditions; tuberculosis, pneumonia, and respiratory infection detection from chest X-rays; and cervical cancer screening from Visual Inspection with Acetic Acid (VIA). This approach will help address the chronic shortage of specialists in-country and the need for urgent diagnosis to initiate timely treatment, prevent deterioration, and improve patient outcomes and safety.

e. **AI based inventory forecasting.** With a working supply chain in place [Strategic Action 5.6c] by Q1 2030 , the aim is to enhance the efficiency and reliability of the Ministry's supply chains by predicting demand for essential medicines and supplies. By leveraging AI to analyze historical usage patterns, seasonal trends, and other factors, AI-powered inventory forecasting will assist to ensure that the right items are available at the right time, minimize shortages, streamline logistics, and reducing waste.

f. **Leverage high-capacity UAVs to expand healthcare access and emergency response.** Utilizing high-capacity UAVs to bridge healthcare access gaps across Vanuatu's dispersed and remote communities. By deploying drones capable of carrying larger payloads over extended distances, the Ministry can ensure timely delivery of essential medical supplies and improve responsiveness during emergencies. The effectiveness and sustainability of this initiative will be reviewed towards the end of the digital health strategy cycle (2025–2030) to assess impact, leverage new technological advancements in this space that cannot be anticipated currently (i.e., 2024), and to guide future investments.

Part

4

Sustainability Plan

The implementation of this Strategy must extend beyond the launch of digital systems. It must also ensure that these systems can be maintained, supported, and improved over time.

Although the Ministry of Health has not adopted a singular approach to sustainability during the formulation of this Strategy, this Strategy provides a structured set of options to support the financing, operation, and long-term maintenance of digital health investments from initial procurement to system decommissioning. To ensure responsible stewardship, sustainability considerations must become a standard agenda item for the Digital Health Steering Committee in the review of any new digital health proposals.

This Strategy presents four core components:

- Public-private partnerships
- Monetizing community internet access
- Capacity building and organizational reform; and
- Aligning governance frameworks to sustainability goals.

1. Leverage Public-Private Partnerships (PPPs) to Reduce Capital Burden

Government of Vanuatu recognizes that the public sector alone cannot sustain the capital-intensive and evolving needs of digital health. The plan proposes opportunistically leveraging public-private partnerships (PPPs) where they add clear value, reduce public expenditure, and provide long-term operational stability. These partnerships must be guided by fair procurement processes, risk-sharing agreements, and strong governance frameworks to ensure accountability and alignment with the public interest.

Therefore, under the New Strategy, public-private partnerships in digital health will be explored as follows:

1. **Partner with local business owners and NGOs** to co-fund and install Starlink systems in remote health facilities. In exchange, providers may be allowed to resell unused bandwidth capacity.
2. **Collaborate with solution vendors** and to treatment them as “partners” to implement and maintain digital systems (e.g., EHR, LIS, RIS) through preferred pricing, leasing models or performance-based contracts that minimize upfront investment and shift some of the risks to the vendor.
3. **Formalize zero-rated health content agreements** with ISPs and mobile network operators such as Vodafone and Digicel to ensure access to digital health services without data charges.
4. **Encourage community-based service models** with youth enterprises or cooperatives to maintain internet hubs or IT equipment in rural communities, funded partially through shared revenue models.

2. Monetize Digital Infrastructure to Support Connectivity Costs

The operational sustainability of rural digital infrastructure, particularly for satellite internet (e.g., Starlink), will require new models to offset monthly service and maintenance costs. The Strategy outlines a plan to monetize digital infrastructure while enhancing digital access for communities.

Therefore, under the New Strategy, monetization of digital infrastructure will be explored as follows:

1. **Enable health facilities to act as community digital hubs.** Clinics equipped with Starlink terminals will offer public Wi-Fi. Community members will pay a nominal access fee to connect to the internet, using prepaid vouchers.
2. **Establish a local "connectivity fund"** in each provincial health office. Revenues collected from community internet sales will be deposited into this fund and used exclusively for Starlink subscription costs, hardware upgrades, and maintenance.
3. **Develop SOPs and revenue management tools** for health staff or designated community agents (e.g., Area Councils) to ensure that funds are tracked and reported transparently.

3. Institutionalize Human and Organizational Capacity for Local Ownership

Sustainability is not just a financing issue. A sustainable digital health system must be embedded in strong institutions with sufficient technical capacity, predictable funding, and workforce retention mechanisms. Without this, digital systems risk failing due to lack of maintenance, support, or use.

Therefore, under the New Strategy, institutionalizing capacity will explore the following:

1. **Create recurrent budget lines** for digital health, including subscriptions, cloud hosting, software licensing, hardware replacements, and staff salaries.
2. **Work with the Public Service Commission (PSC)** to reclassify key technical roles within the Digital Health Unit, ensuring compensation structures that attract and retain skilled ICT professionals.
3. **Develop partnerships with vocational and academic institutions** (e.g., VIT, USP) to create a local pipeline of graduates in health informatics, IT support, and data science.
4. **Invest in continuous upskilling** of staff through professional development, on-the-job mentorship, and regional technical exchanges with countries implementing similar systems.

4. Embed Sustainability Principles into Governance and Legal Frameworks

The digital health ecosystem must be underpinned by enabling legislation and procurement policies that allow systems to be maintained, replaced, or evolved with minimum disruption.

Therefore, under the New Strategy, governance and policy alignment will unfold as follows:

1. **Update procurement policies** to prioritize total cost of ownership (TCO) over initial purchase price. All tenders must include clear provisions for long-term support, modular upgrades, and off-the-shelf availability with minimal customization.
2. **Allow revenue generation at facility level**, through a dedicated Ministerial Order or regulation, that permits small-scale monetization of digital services strictly for sustainability purposes. This should include fee ceilings, exempt populations, and required community consultations.
3. **Explore regional shared services models**, where Vanuatu can share digital systems and infrastructure, helpdesks, or software vendors with neighboring countries for cost efficiency and interoperability.

Part

5

Costed Implementation Roadmap

With an estimated total budget of US$10 million (or over VUV 1 billion) to deliver the Ministry's commitments under the new Strategy, the Costed Implementation Roadmap will be developed as a standalone, non-public document. It is intended to support internal planning and guide funding negotiations with development partners.

This approach ensures the Vanuatu Digital Health Strategy 2025 remains a high-level policy and vision document, while allowing the Roadmap to remain flexible and responsive to changing circumstances. By maintaining the Roadmap as a dynamic tool, the Ministry can effectively adapt implementation to evolving resource mobilization efforts and emerging partnerships, recognizing that progress will be phased and contingent on the availability and timing of external financing.

Nevertheless, to provide a sense of direction and indicative investment needs, a Provisional Costed Roadmap is provided on Appendix A: Provisional Costed Implementation Roadmap.

This provisional version outlines priority activities and sequencing aligned with the five strategic pillars, the national health policy, and broader government commitments such as the Vanuatu 2030: The People's Plan. It serves as a starting point for development partner engagement while making clear that full costing, timelines, and implementation modalities will be refined through ongoing dialogue and coordinated sector-wide planning.

Part

6

Monitoring and Evaluating the Digital Health Strategy

The Monitoring and Evaluation (M&E) Plan for the Vanuatu Digital Health Strategy 2025–2030 is designed to track progress against strategic goals, ensure accountability, and inform adaptive management of digital health investments.

It aligns with the Strategy's five strategic pillars and sets out clear objectives, expected outputs and outcomes, key indicators, data sources, and data collection frequency.

This M&E framework supports results-based management by enabling stakeholders to measure implementation progress, assess impact, and adjust activities as needed. The indicators are designed to be SMART—specific, measurable, achievable, relevant, and time-bound—and reflect a balance between quantitative and qualitative metrics. Where available, baseline values and targets are provided to track improvements over time.

Data will be drawn from the Ministry's digital health systems, facility reports, and partner monitoring tools, ensuring minimal duplication of reporting efforts. The Digital Health Unit will coordinate M&E efforts in collaboration with provincial teams, technical leads, and development partners.

To minimize complexity and reduce the reporting burden on staff, a streamlined set of 12 indicators has been selected.

Strategic Pillar	Goal	Expected Output	Expected Outcome	Indicator	Frequency
Pillar 1: Strengthening Health Information	Enhance data quality, availability and accessibility for decision-making.	Standardized data collection tools deployed nationally.	Improved data completeness and accuracy across health programs.	1.1 Percentage of health facilities using standardized tools for routine reporting.	Semi-annual
	Develop a national health data dictionary and metadata registry.	Published and regularly updated health data dictionary.	Consistent interpretation and use of health data terms nationwide.	1.2 Availability of national health data dictionary aligned with WHO standards.	Annually
Pillar 2: Expanding Universal Health Coverage	Use telehealth and mobile health solutions (e.g. NEIR) to extend service delivery to remote communities.	Teleconsultation and the use of mobile applications for community health workers deployed.	Increased service coverage in underserved areas.	2.1 Number of health facilities using teleconsultation 2.2 Number of health workers using mobile health tools.	Annually
	Integrate digital health into primary healthcare packages.	Digital tools embedded in maternal, child health and NCD services.	Increased uptake of essential health services and improved reporting.	2.3 Utilization rate of digital-supported PHC services.	Annually

Strategic Pillar	Goal	Expected Output	Expected Outcome	Indicator	Frequency
Pillar 3: Improving Patient Continuity of Care	Ensure seamless referrals and follow-up through digital platforms.	Referral tracking features implemented in NEHR and NEIR systems.	Reduced missed referrals and treatment interruptions.	3.1 Percentage of referrals successfully completed and tracked.	Semi-annual
	Ensure that patients receive coordinated and uninterrupted care across health facilities and over time through better use of digital health systems.	Digital systems and processes enable the sharing and retrieval of patient information across care settings.	Health workers can access relevant patient history at the point of care.	3.2 Percentage of facilities with digital access to patients' prior clinical summaries or visit records.	Semi-annual
Pillar 4: Building Climate Resilient Health Systems	Enhance the health system's capacity to manage health emergencies through timely data, coordinated digital response, and operational continuity.	Deployment and routine use of a digital Health Emergency Management System (HEMS) suite of tools to support preparedness, response, and recovery operations.	Health authorities can coordinate timely and data-informed responses to public health emergencies using digital platforms.	4.1 Percentage of public health emergencies where the digital Health Emergency Management System (HEMS) suite of tools was activated and used for coordination, communication, or reporting.	After each declared public health emergency
	Leverage digital technologies to improve the health system's ability to anticipate, prepare for, respond to, and recover from climate-related and environmental health risks.	Deployment of digital platforms and tools that enhance surveillance, early warning, and response capabilities for climate-sensitive diseases and disasters.	Timely detection and reporting of climate-sensitive diseases (e.g., dengue, leptospirosis).	4.2 Number of disaster or outbreak alerts issued through the early warning systems per year. 4.3 Average time (in hours) between the issuance of an early warning or detection of a climate event (e.g., cyclone, flooding) and the initiation of the first health response action through the digital system.	Annual After each event

Strategic Pillar	Goal	Expected Output	Expected Outcome	Indicator	Frequency
Pillar 5: Strengthening Foundational Health	Improve coordination and leadership in digital health investments.	Multi-stakeholder Digital Health Steering Committee functional.	Increased alignment and synergy among digital health projects.	5.1 Number of quarterly coordination meetings held with development partners.	Annual
	Build and retain a skilled digital health workforce to support the implementation and sustainability of national digital health initiatives.	Career pathways, role clarity, and competency frameworks are in place for digital health professionals.	Improved recruitment, capacity, and retention of qualified digital health staff across the health system.	5.2 Percentage of digital health positions filled with staff who meet national competency standards.	Annual

Appendices

Appendix A:
Provisional Costed Implementation Roadmap

Below is the provisional Costed Implementation Roadmap. The total estimated budget required to fully deliver the Strategy's commitments over a six-year period is just under US$10 million. These budget estimates are indicative and will be refined over time, based on the level and nature of support secured from international development partners.

Development partner commitments and budget removed intentionally.

Vanuatu Digital Health Strategy Implementation Roadmap 2025–2030

5 Thematic Pillars
23 Strategic Directions
84 Stratgic Action Items

Partner funding required
Partially funded, but will require more funding

	Funded?	Department/ Units	Year 1 (2025)				Year 2 (2026)				Year 3 (2027)				Year 4 (2028)				Year 5 (2029)				Year 6 (2030)			
			Q1/ 25	Q2/ 25	Q3/ 25	Q4/ 25	Q1/ 26	Q2/ 26	Q3/ 26	Q4/ 26	Q1/ 27	Q2/ 27	Q3/ 27	Q4/ 27	Q1/ 28	Q2/ 28	Q3/ 28	Q4/ 28	Q1/ 29	Q2/ 29	Q3/ 29	Q4/ 29	Q1/ 30	Q2/ 30	Q3/ 30	Q4/ 30
Pillar 1: Advancing Health Information (SD 3)																										
1.1 Institutionalize data management practices (4)	**Y**																									
1.1a. Standardize health data	Y	Digital Health	■	■	■	■																				
1.1b. Establish a Data Governance SubCommittee	Y	Digital Health		■	■																					
1.1c. Develop clear data governance SOPs	Y	Digital Health			■	■																				
1.1d. Continuous improvement to strengthen data quality	Y	Digital Health				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1.2 Build an Information Culture (2)	**P**																									
1.2a. Implement a Corporate Intranet	N	Planning, Health Promotion							■	■																
1.2b. Develop management dashboards	Y	Digital Health			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1.3 Maximize space efficiency with digital archiving (5)	**P**																									
1.3a. Workwith Government legal framework	Y	Digital Health			■	■																				

	Funded?	Department/ Units	Year 1 (2025)				Year 2 (2026)				Year 3 (2027)				Year 4 (2028)				Year 5 (2029)				Year 6 (2030)			
			Q1/ 25	Q2/ 25	Q3/ 25	Q4/ 25	Q1/ 26	Q2/ 26	Q3/ 26	Q4/ 26	Q1/ 27	Q2/ 27	Q3/ 27	Q4/ 27	Q1/ 28	Q2/ 28	Q3/ 28	Q4/ 28	Q1/ 29	Q2/ 29	Q3/ 29	Q4/ 29	Q1/ 30	Q2/ 30	Q3/ 30	Q4/ 30
1.3b. Acquire a Document Management System	N	Digital Health																								
1.3c. Scan and electronically archive patient records	N	Curative																								
1.3d. Destruct non-essential records	N	Curative																								
1.3e.Use offsite storage	N	Curative																								
Pillar 2: Achieving Universal Health Coverage(SD 6)																										
2.1 Adopt National ID as National Health Number (NHN) (3)	**P**																									
2.1a. Amend Vanuatu National Identity Act with health-specific provisions	Y	Planning, OAG																								
2.1b. Develop a Civil Registry and NHN integration blueprint	Y	Digital Health																								
2.1c. Improve patient biometrics	N	Digital Health																								
2.2 Automate Vital Events (2)	**Y**																									
2.2a. Implement DHIS2 Vital Events module	Y	Public Health, Curative																								
2.2b. Digital registration at point of care	Y	Curative																								
2.3 Strengthen Primary Health care Through Telemedicine (4)	**P**																									
2.3a. Design the telemedicine model	Y	Curative																								
2.3b. Conduct a regulatory review	Y	Digital Health																								
2.3c.Implement teleconsultation capabilities	N	Public Health, Curative																								
2.3d. Partner with Area Council for shared infrastructure	Y	Digital Health																								
2.4 Scale up Heartcare NCD application (3)	**N**																									
2.4a. Establish cnical and technical requirements at each provincial sites	N	NCD																								
2.4b. Rollout Heartcare in provincial sites	N	NCD																								
2.4c.Upgrade Heartcare application	N	NCD																								

	Funded?	Department/ Units	Year 1 (2025)				Year 2 (2026)				Year 3 (2027)				Year 4 (2028)				Year 5 (2029)				Year 6 (2030)			
			Q1/ 25	Q2/ 25	Q3/ 25	Q4/ 25	Q1/ 26	Q2/ 26	Q3/ 26	Q4/ 26	Q1/ 27	Q2/ 27	Q3/ 27	Q4/ 27	Q1/ 28	Q2/ 28	Q3/ 28	Q4/ 28	Q1/ 29	Q2/ 29	Q3/ 29	Q4/ 29	Q1/ 30	Q2/ 30	Q3/ 30	Q4/ 30
2.5 Implement Community Outreach Capabilities (3)	**N**																									
2.5a. Develop a digital community outreach strategy	N	Public Health																								
2.5b. Extend digital application to medical missions	N	Curative																								
2.5c.Develop and publish outreach API	N	Digital Health																								
2.6 Promote Public Health and Prevention (2)	**N**																									
2.6a. Design user friendly mHealth app	N	Public Health																								
2.6b. Leverage SMS and IVR services	N	Digital Health																								
Pillar 3: Improving Patient Continuity of Care (SD 4)																										
3.1 Rollout the National Electronic Immunization Registry (NEIR) (3)	**Y**																									
3.1a. Accelerate NEIR design and implementaion	Y	VDI																								
3.1b. Pilot NEIR in select provinces	Y	VDI																								
3.1c. Rollout NEIR nationally	Y	VDI																								
3.2 Rol Out National Electronic Health Record System (5)	**P**																									
3.2a. Develop NEHR clinical and technical requirments	Y	Curative																								
3.2b. Clean, cull, and reorganize patient medical records	N	Curative																								
3.2c. Determine feasiblity of modernizing Patient Information System	Y	Curative																								
3.2d. Establish and action NEHR acquisition strategy	N	Curative																								
3.2e. Implement NEHR	N	Curative																								
3.3 Introduce Telepatholigy and National Laboratory Information Systems (6)	**N**																									
3.3a. Develop telepathology and NUIS clinical and technical requirements	N	Laboratory																								
3.3b. Acquire telepathology solution	N	Laboratory																								
3.3c. Implement telepathology	N	Laboratory																								

	Funded?	Department/ Units	Year 1 (2025)				Year 2 (2026)				Year 3 (2027)				Year 4 (2028)				Year 5 (2029)				Year 6 (2030)			
			Q1/ 25	Q2/ 25	Q3/ 25	Q4/ 25	Q1/ 26	Q2/ 26	Q3/ 26	Q4/ 26	Q1/ 27	Q2/ 27	Q3/ 27	Q4/ 27	Q1/ 28	Q2/ 28	Q3/ 28	Q4/ 28	Q1/ 29	Q2/ 29	Q3/ 29	Q4/ 29	Q1/ 30	Q2/ 30	Q3/ 30	Q4/ 30
3.3d. Acquire NLIS	N	Laboratory																								
3.3e. Implement and integrate NLIS and NEHR	N	Laboratory																								
3.31. Integrate NLIS with Go.Data and DHIS2	N	Laboratory, Surveillance																								
3.4 Deploy a National Radiology Information System (4)	**N**																									
3.4a. Assess and evaluate existing PACS	N	Radiology																								
3.4b. Define NRIS clincal and technical requirements	N	Radiology																								
3.4c. Acquire NRIS	N	Radiology																								
3.4d. Implement and integrate NIRS with NEHR	N	Radiology																								
Pillar 4: Improving Patient Continuity of Care (SD 4)																										
4.1 Develop early warning system for climate-sensitive diseases (3)	**Y**	Environment																								
4.1a Design the Early Warning Systems (EWS) framework	Y	Environment																								
4.1b Implement digital platform for climate and health data (DHIS2 Climate)	Y	Environment																								
4.1c Implement EWS for climate sensitive diseases	Y	Environment, Surveillance																								
4.2 Improve heath emergency and disaster risk management (3)	**N**																									
4.2a Standardize disaster response data collection and reporting	N	Health Emergency																								
4.2b Develop requirements for HEMS	N	Health Emergency																								
4.2c Implement HEMS	N	Health Emergency																								
4.3 Implement EMMS (2)	**N**																									
4.3a Development EMMS requirements	N	Environment																								
4.3b Implement EMMS	N	Environment																								

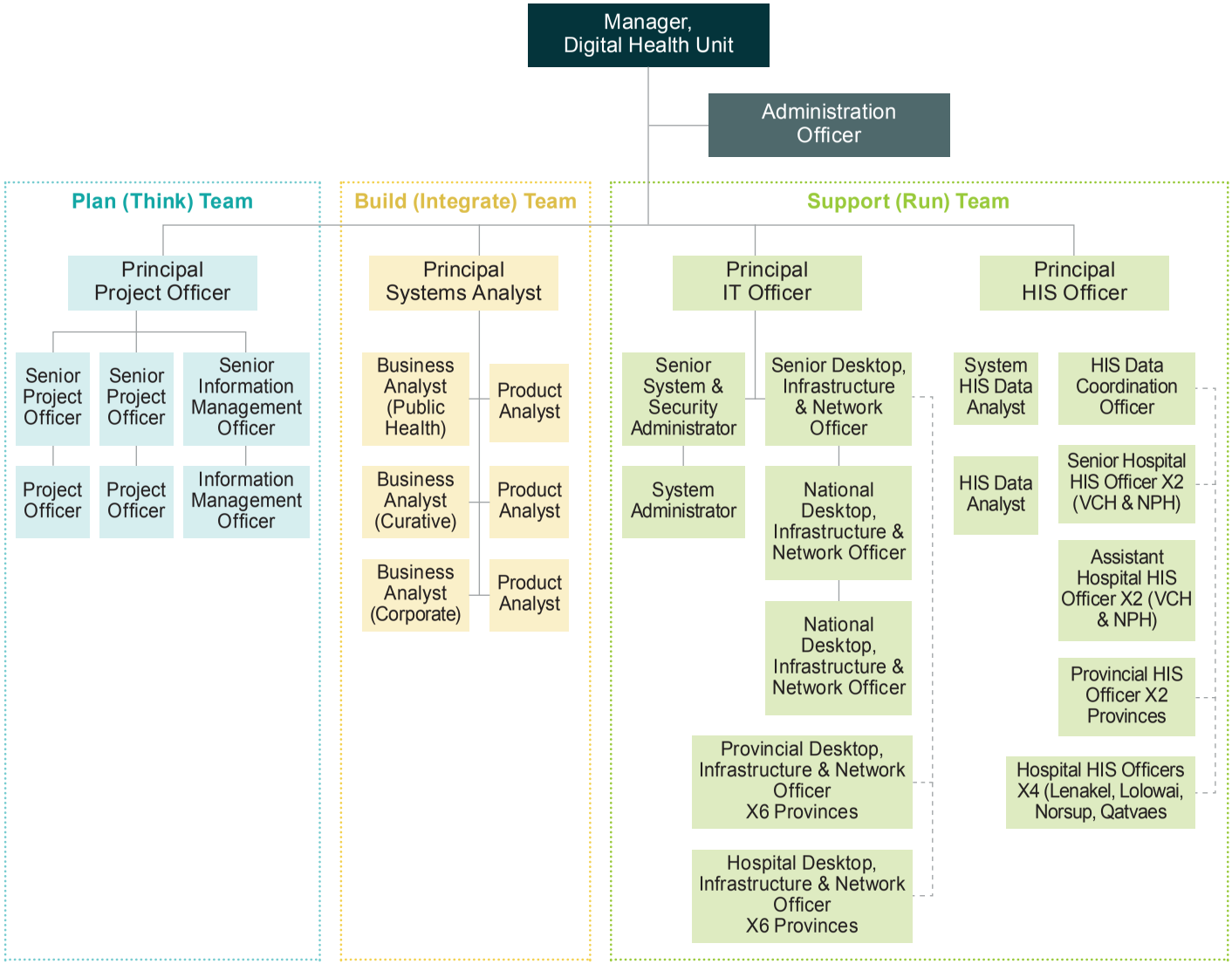
	Funded?	Department/ Units	Year 1 (2025)				Year 2 (2026)				Year 3 (2027)				Year 4 (2028)				Year 5 (2029)				Year 6 (2030)			
			Q1/ 25	Q2/ 25	Q3/ 25	Q4/ 25	Q1/ 26	Q2/ 26	Q3/ 26	Q4/ 26	Q1/ 27	Q2/ 27	Q3/ 27	Q4/ 27	Q1/ 28	Q2/ 28	Q3/ 28	Q4/ 28	Q1/ 29	Q2/ 29	Q3/ 29	Q4/ 29	Q1/ 30	Q2/ 30	Q3/ 30	Q4/ 30
Pillar 5: Strengthening Foundational Health Infrastructure (SD 7)																										
5.1 Invest in Human Capital (5)	**P**																									
5.1a Reorganize HIS and IT into a single Digital Health unit	Y	Human Resources			■	■																				
5.1b Conduct job re-evaluation of positions	Y	Human Resources	■	■																						
5.1c Partner for targeted human capital assistance	N	Human Resources																								
5.1d Strengthen digital literacy across the health sector	N	Human Resources																								
5.1e Implement a Healthcare Provider Registry	N	Human Resources																								
5.2 Improve Digital Governance (2)	**Y**																									
5.2a Introduce new Digital Health Steering Committee structure	Y	Digital Health	■																							
5.2b Introduce Digital Health subcommitees	Y	Digital Health	■	■																						
5.3 Develop Legal and Regulatory Framework (7)	**P**																									
5.3a Expand health specific guidelines under the Vanuatu Data Protection Act	Y	Digital Health			■																					
5.3b Establish a Health Information Retention and Disposal Policy	Y	Digital Health			■																					
5.3c Introduce Telemedicine and Remote Health Services Policy	Y	Curative			■	■																				
5.3d Institute a Digital Health Workforce Development Policy	Y	Human Resources				■	■																			
5.3e Establish a Health Data Sharing and Access Policy	Y	Digital Health					■	■																		
5.3f Establish a Public Health and Research Governance Policy	Y	Public Health						■	■																	
5.3g Establish an AI Governance Policy for Healthcare	Y	Digital Health		■								■	■	■												
5.4 Adopt Interoperability Standards (3)	**P**																									
5.4a Adopt solutions that are HL7 and FHIR compliant	Y	Digital Health	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5.4b Integrate standards with exisiting digital health systems	N	Digital Health																								
5.4c Leapfrog to ICD-11	?	Public Health, Curative																								

	Funded?	Department/ Units	Year 1 (2025)				Year 2 (2026)				Year 3 (2027)				Year 4 (2028)				Year 5 (2029)				Year 6 (2030)			
			Q1/ 25	Q2/ 25	Q3/ 25	Q4/ 25	Q1/ 26	Q2/ 26	Q3/ 26	Q4/ 26	Q1/ 27	Q2/ 27	Q3/ 27	Q4/ 27	Q1/ 28	Q2/ 28	Q3/ 28	Q4/ 28	Q1/ 29	Q2/ 29	Q3/ 29	Q4/ 29	Q1/ 30	Q2/ 30	Q3/ 30	Q4/ 30
5.5 Improve IT and Network Infrastructure (4)	**P**																									
5.5a Deploy Starlink across hospitals, health centers and dispensaries	P	Digital Health																								
5.5b Standardize hardware and software requirements	N	Digital Health																								
5.5c Deploy and refresh digital devices	N	Digital Health																								
5.5d Share infrastructure with area councils	Y	Digital Health																								
5.6 Strengthen Supply Chain Management (3)	**N**																									
5.6a Implement a national asset registry	?	Asset																								
5.6b Develop a supply chain strategy	?	Pharmacy, CMS																								
5.6c Upgrade and configure mSupply (national rollout)	?	Pharmacy, CMS																								
5.7 Embrace Artificial Intelligence (6)	**N**																									
5.7a Adopt AI for clinical support in hospitals and primary care	N	Curative																								
5.7b Deploy medical chatbots for patient education and support	N	NCD																								
5.7c Implement AI for disease surveillance and outbreak prediction	N	Surveillance																								
5.7d Implement AI for image-based diagnostics	N	Curative																								
5.7e Explore AI based inventory forecasting	N	Pharmacy, CMS																								
5.7f Leverage high capacity UAVs to expand healthcare access + emergency response	N	Pharmacy, CMS																								

Appendix B:

New Digital Health Unit Organizational Structure

The new Digital Health Unit structure plans to expand its workforce to 50 positions, in addition to 18 unfilled Hospital Records Clerk roles, bringing the total to 68 full-time positions across national, provincial, and hospital levels. This represents a net increase of 27 new roles focused on health information and IT services.



Appendix C:

RACI Between Ministry of Health and the Department of Communications and Digital Transformation

This RACI matrix outlines the roles and responsibilities between the Ministry of Health (MoH) and the Department of Communications and Digital Transformation (DCDT).

- R (Responsible) – The party who performs the task.
- A (Accountable) – The party who owns the outcome and makes decisions.
- C (Consulted) – The party who provides input or expertise.
- I (Informed) – The party who is kept updated but is not directly involved.

IT Service Activity	MoH	DCDT
IT Governance, Policy and Architecture		
Whole of Government Digital Governance & Strategy	C, I	R, A
Health Sector Digital Governance and Strategy	R, A	C, I
Whole of Government Digital Policies & Standards Compliance	C, I	R, A
Health Sector Digital Policies & Standards Compliance	R, A	C, I
Whole of Government Enterprise Architecture	C, I	R, A
Health Sector Enterprise Architecture	R, A	C, I
Digital Health Budget Planning & Allocation	R, A	C
IT Services Agreements (SLAs) for shared services and network infrastructure	I	R, A
IT Service Agreements (SLAs) for Health Applications	R, A	I
Software & Applications		
Government Shared Services Office Tools Procurement & Licensing (e.g., Office 365)	I	R, A
Health Specific Digital Tools and Applications	R, A	I
Business Requirements Gathering	R, A	I
Application Acquisition, Development or Customization	R, A	C, I
Application Hosting & Infrastructure	C	R, A
1st Level IT Support (Helpdesk)	R, A	C
2nd Level Support (Application) including application-level database	R, A	C
3rd Level Support (System level, Infrastructure & Escalations)	C	R, A
IT Governance, Policy and Architecture		
Whole of Government Digital Governance & Strategy	C, I	R, A
Health Sector Digital Governance and Strategy	R, A	C, I
Whole of Government Digital Policies & Standards Compliance	C, I	R, A

IT Service Activity	MoH	DCDT
IT Infrastructure & Network		
Data Center & Cloud Management	C, I	R, A
Network & Internet Services	C, I	R, A
IT Security & Firewall Management	C, I	R, A
End-User Device Management (Laptops, Desktops)	R, A	C, I
Email & Collaboration Tools	C	R, A
Cybersecurity & Compliance		
Data Security & Encryption	I	R, A
Identity & Access Management	I	R, A
Cybersecurity Incident Response	I	R, A
Compliance with Data Protection Laws	R, A	C, I
Procurement & Vendor Management		
Vendor Contract Management for Non-Health	I	R, A
Vendor Contract Management for Health	R, A	I
Whole of Government Hardware & Network Procurement	C, I	R, A
Health Sector Hardware & Network Procurement	R, A	C, I
Health Sector Software License Management	R, A	C, I
User Training & Change Management		
End-User Training for Software	R, A	I
IT Change Management & Communication	R, A	I
Disaster Recovery & Business Continuity		
Backup & Disaster Recovery Planning	C, I	R, A
Incident Response & Recovery	C, I	R, A