MINSANTE

JOHNS HOPKINS CAMEROON PROGRAM

I-TECH International Training & Education Center for Health

BUILDING EFFECTIVE HEALTH INFORMATION SYSTEMS UNDER PEPFAR

Final report of the development of the eHealth Strategic Plan for Cameroon

JULY 2019 - JANUARY 2020

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KEY STAKEHOLDERS:

- Ministry of Public Health (MINSANTÉ)
- Ministry of Posts and Telecommunications
- US Centers for Disease Control and Prevention (CDC) -- Atlanta and Yaoundé
- University of Washington – I-TECH
- Johns Hopkins Cameroon Program (JHCP)

KEY ACTORS (ELABORATION, REVIEW, VALIDATION AND ADOPTION)

- Dr. Maurice Fezeu, Head of Health Information Unit (HIU)
- Mr. Emmanuel Batoum, Head of Computer Unit (CU)
- Pr. Samuel Kingue, Technical Advisor #3
- Dr. Valentine Ngum Ndze, Project Coordinator, Senior Program Officer, JHCP
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- Mr. Ubald Tamoufe, Regional Director, JHCP
- Mr. Colince Keleko Gueatia, Strategic Information Advisor, Division of Global HIV & TB, CDC Cameroon
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- Dr. Tom Oluoch, Informatics Advisor, Division of Global HIV & TB, CDC Atlanta[2]
- Mr. James Kariuki, Informatics Advisor, Division of Global HIV & TB, CDC Atlanta[3]
- Dr. Nancy Puttkammer, Principal Investigator and Technical Advisor, I-TECH/ University of Washington[4]
- Ms. Joanna Diallo, Managing Director, Digital Initiatives, I-TECH/ University of Washington
- Dr. Jan Flowers, Technical Advisor, I-TECH/ University of Washington

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Abbreviations

ANTIC	Agence Nationale des Technologies de l'information (National Agency for Information and Communication)
ART	Agence de Régulation des Télécommunications (Telecommunications Regulatory Board of Cameroon)
CAMTEL	Cameroon Telecommunications
CBCHS	The Cameroon Baptist Convention (CBC) Health Services
CDC	The Centers for Disease Control and Prevention
CELTRAD	Cellule de Traduction (Translation Unit)
CI	Cellule informatique (IT Unit)
CIS	Cellule des Informations Sanitaires (Health Information Unit)
CIU	Code Identifiant Unique du Patient (Unique Patient Identifier)
CT3	Technical Adviser No. 3 at the MOH
DAJC	Division of Legal Affairs and Litigations
DLMEP	Direction de la Lutte contre la Maladie, les Epidémies et les Pandémies (Department of the Fight against Disease, Epidemics and Pandemics)
EN	English
FR	French
GIZ	German Society for International Cooperation
HIS	Health Information Systems
HIU	Health Information Unit (Cellule des Informations Sanitaires)
ICD	The International Classification of Diseases
ICT	Information and Communications Technology
I-LEAD	Intergovernmental Learning Exchange To Advance Data-Driven Decision Making
ISO	Information Savvy Organization
I-TECH	International Training and Education Center for Health
ITO	International Telecommunications Organization
ITU	International Telecommunication Unit
JHCP	Johns Hopkins Cameroon Program
MINAS	Ministère des Affaires Sociales (Ministry of Social Affairs)
MINEFI	Ministry of Economy and Finance
MINEPAT	Ministry of Economy, Planning and Regional Development
MINPOSTEL	Ministry of Posts and Telecommunications
MINSANTÉ	Ministry of Public Health (MOH)
NEHSP	National eHealth Strategic Plan
ONSP/NPHO	Observatoire Nationale de la Santé Publique (National Public Health Observatory)
PEPFAR	President's Emergency Plan for AIDS Relief
SIGIPES	Système Informatique de Gestion Intégrée du Personnel de l'Etat et de la Solde (Computerized system for the integrated management of state personnel and payroll)
SOCI	Stages of Continuous Improvement
SOP	Standard Operating Procedure
SP	Strategic Planning
SWOT	Strengths, Weaknesses, Opportunities, and Threats
UCSF	University of California, San Francisco
UW	University of Washington
WHO	World Health Organization

Executive Summary

In 2017-19, the US Centers for Disease Control and Prevention mobilized PEPFAR's Innovation Fund to engage several partners within a consortium to support improvements to Cameroon's national Health Information System (HIS). As part of the Innovation Fund Consortium, the University of Washington International Training and Education Center for Health (I-TECH) assisted the Cameroon Ministry of Health (MINSANTÉ) to complete an eHealth strategic planning process, toward the long-range goal of strengthened eHealth governance in Cameroon.

I-TECH initiated its support for eHealth strategic planning in Cameroon in May 2018, working with key units of the MINSANTÉ to define the framework, process, methods for stakeholder participation, and timeline for strategic planning. In February 2019, the MINSANTÉ officially recognized the project and named stakeholders to the planning committee, under the joint technical leadership of the Health Information Systems (HIS) and the Information, Communications and Technology (ICT) Units of the MINSANTÉ. To provide in-country support for planning workshop facilitation as well as key technical expertise in eHealth and costing, I-TECH engaged the Johns Hopkins Cameroon Project (JHCP), a Cameroon-based non-governmental organization with expertise in the health sector, HIS, and strategic planning, as a key technical assistance partner. The strategic planning process was a multi-sectoral process with representation from governmental Ministries, non-governmental partners, universities, multilateral organizations, and the private sector. Based on weekly planning calls, document review, joint planning of workshop agendas, and joint drafting and editing of the various sections of the strategic plan, the MINSANTÉ, I-TECH, and JHCP each contributed to the process. Together, the partners ensured that the final plan itself represented the concerns and priorities of the MINSANTÉ, reflected the input of diverse stakeholders, and embodied senior expertise in the field of eHealth.

Cameroon's strategic planning process drew upon several frameworks. The eHealth strategic planning process followed the World Health Organization (WHO) and International Telecommunication Union's 2012 "National eHealth Strategy Toolkit" as an overall process guideline. The Public Health Informatics Institute's "Informatics Savvy Organization" (ISO) toolkit was used to harmonize perspectives of health leaders on current state of eHealth and priorities for advancement. Finally, the Health Information Systems (HIS) Stages of Continuous Improvement (SOCI) Assessment Toolkit was used to frame a pathway towards optimized HIS systems, thereby helping to identify specific sub-objectives and metrics for progress within a set of overarching strategic objectives. Together, these tools allowed stakeholders to consider the development of the eHealth ecosystem as a continuous improvement process and see a clear pathway towards optimized systems from the current state.

The final Cameroon National eHealth Strategic Plan 2020-24 defined strategic objectives, sub-objectives, outcomes, indicators, and costs across the following strategic areas: Leadership and governance; Legislation, Policy & Compliance, Human Resources, Strategy and investment, Infrastructure, Services and applications, and Standards and interoperability.

The project included both best practices and lessons learned, which may be useful for adaptation in other African countries seeking to carry out eHealth strategic planning and strengthened HIS governance.

e-Health strategic planning process steps

1. Participate in I-LEAD workshop
2. Administer pre-planning survey
3. Establish technical working groups
4. Conduct Elaboration Workshop
5. Conduct Review Workshop
6. Conduct Validation Workshop
7. Conduct Adoption Workshop

OVERALL BEST PRACTICES INCLUDED:

- The project successfully engendered governmental engagement and ownership of the strategic planning process. The time invested at the start of the project to build relationships with key MINSANTÉ units, to jointly define the process rather than imposing a pre-conceived process, to carefully identify stakeholders across sectors, and to seek the highest level of Ministerial authorization of the strategic planning effort, was critical to local ownership.
- Using comprehensive frameworks for eHealth, with a maturity orientation, helped to focus strategic planning on tangible, realistic

objectives grounded in the current situation. These frameworks also helped to ensure a comprehensive perspective recognizing the complexity of the field and the wide range of strategic domain areas which must come together for successful HIS implementation supporting strong data quality and data use.

- The Cameroon eHealth strategic planning process involved multiple steps, which progressively built upon each other and developed knowledge and skills of Cameroonian participants related to HIS governance. The steps included: participation by MINSANTÉ delegates in the CDC-sponsored I-LEAD learning workshop on best practices in health informatics at CDC Headquarters in Atlanta; a pre-planning survey to rate strengths and gaps in Cameroon's existing eHealth landscape; and a series of multi-day multi-stakeholder workshops to contribute to the strategic plan, including an Elaboration Workshop, a Review Workshop, a Validation Workshop, and the final Adoption Workshop.

THE LESSONS LEARNED FROM THE PROJECT WERE:

- Commitment to a conceptual framework is important to guide eHealth strategic planning, given the complexity of the field. The project used a hybrid framework, seeking to draw upon the strengths of several eHealth frameworks. This had mixed success. Local stakeholders were most familiar with the WHO/ITU eHealth toolkit. While they appreciated the other frameworks, it would have been best to either use a single framework, or to spend a more time orienting stakeholders to each framework.
- Strategic planning, whether for eHealth or any other domain, generally takes place in a context where it is impossible to do it all. Therefore identifying appropriate priorities, shaping smart plans, and building consensus for these plans are central challenges. eHealth strategic planning must bring together health leaders who are not necessarily experts across the wide set of eHealth domains with a range of technical specialists with expertise in these domains. This project sought to engage stakeholders across these levels in a series of participatory workshops. Due to practical factors, the specific participants present at each workshop varied. This meant having to use time to revisit logic, reinforce consensus, and sometimes revisit the direction set in the prior workshop. Having greater continuity of participants across workshops would have helped to more seamlessly use each workshop as a building block for the next.

This report explains Cameroon's strategic planning process in further detail, and includes select companion documents showing some of the tools used throughout the process, such as meeting agendas and the actual 2020-2024 National Digital Health Strategic Plan for Cameroon.

The contents of the report were largely developed by JHCP, with minimal editing from the I-TECH team so as to preserve the essence of how the process played out in Cameroon. I-TECH contributed insights on best practices and lessons learned throughout.

Introduction

0.1 BACKGROUND

National strategies, policies and governance define the implementation environment for national health information systems (HIS), which are recognized to be a foundational building block for HIV epidemic control. The long-term results of HIS strategic planning and the ways in which the process supports these results are summarized in the table below.

The process of institutionalization of the Cameroon eHealth Strategic Planning process was done in two phases leading up to the activity itself. The objective was to ensure that the project was managed and approved by the Ministry of Health with the technical assistance of I-TECH of University of Washington through Johns Hopkins Cameroon Program (JHCP). The project was undertaken with financial support from the US President's Emergency Plan for AIDS Relief (PEPFAR) through a Co-Operative Agreement from CDC to the University of Washington (NU2GGH2020011933).

0.2 PRE-INSTITUTIONALIZATION OF THE PROJECT

I-TECH made an initial visit to Cameroon in May 2018, for purposes of launching the eHealth Strategic Planning (SP) project. The two-member delegation from I-TECH included Principal Investigator Nancy Puttkammer and Senior Digital Health Specialist Jennifer Antilla. They visited key stakeholders and organizational units within Ministry anticipated to be part of the steering committee for the eHealth strategic planning process. Ms. Antilla then joined a delegation from Cameroon at CDC Atlanta for participation in the I-LEAD program in June 2018. This activity included several activities to prepare for eHealth strategic planning, namely completion of the Informatics Savvy Organization (ISO) self-assessment and discussion of roles in eHealth SP. Before I-TECH could formally work with the Cameroon Ministry of Health to launch the eHealth SP process on the ground in Cameroon, I-TECH experienced an interruption in availability of funding, leading to a suspension of activities through December 2018.

In January 2019, with renewed approval to carry forward the work in Cameroon, I-TECH made a second visit to Cameroon to re-engage with stakeholders and re-launch the SP process. An important element of this work was the political harmonization and governance building. The Ministry process required a formal set of steps and documents to move the process forward. During the January trip, Nancy Puttkammer and Technical Advisor Ms. Joanna Diallo drafted a dossier including terms of reference and a list of participating organizations for the MOH to formal convoke the working group for SP.

With stakeholders in Cameroon, we identified several frameworks and toolkits related to HIS maturity and eHealth SP to use in the process. These included the WHO/ITU National eHealth Strategy Toolkit,[1] the Informatics Savvy Organization (ISO) framework,[2] and the HIS Stages of Continuous Improvement (SOCI).[3] From January – April 2019, I-TECH undertook work on the outline for the SP document, and on the tools and resources to be used in country as part of the SP process. The domains of these frameworks included: leadership and governance, development of workforce, infrastructures, interoperability, data quality and data use. With CDC, I-TECH has also adapted a tool which is suitable for the leadership level in Cameroon to prioritize objectives and activities within the SP. This tool is a harmonized version of the ISO and Stages tools.

In April 2019, Joanna Diallo, Strategic Planning Project Lead for I-TECH, conducted a visit to Cameroon to meet with the MOH and JHCP (I-TECH's

BEST PRACTICES

- Develop knowledge and expertise of local eHealth leaders through participation in the CDC-sponsored I-LEAD learning workshop on best practices in health informatics.
- Invest time at the start of the project to build relationships with key units of the Ministry of Health.
- Jointly define the process, carefully identify stakeholders across sectors, and seek the highest level of Ministerial authorization of the strategic planning effort to ensure local ownership.
- Conduct a pre-planning survey to rate strengths and gaps in existing eHealth landscape.
- Plan for a series of multi-day multi-stakeholder workshops to contribute to the strategic plan.

1 WHO / ITU National eHealth Strategy Toolkit (https://www.itu.int/pub/D-STR-E_HEALTH.05-2012).

2 Informatics Savvy Health Department Toolkit (https://www.phii.org/informatics-savvy-toolkit-homepage/informatics-savvy-toolkit-homepage/informatics-savvy-toolkit)

3 HIS Stages of Continuous Improvement Toolkit (https://www.measureevaluation.org/his-strengthening-resource-center/his-stages-of-continuous-improvement-toolkit)

implementing partner in Cameroon), to discuss the best approach to officially launch the project. The objective of the meeting was to (i) present the members of the team, (ii) put in place a strategy to get the authorization from the Minister and (iii) define roles and responsibilities of each team member and agreed on a tentative timeline. The Regional Director set up a committee (JHCP and MOH) to follow-up the process to get the authorization from the Minister of Public Health.

0.3 INSTITUTIONALIZATION OF THE PROJECT

The project had been introduced by the Minister of Health through the letter # E9-08/NH/MINSANTE/SG/CIS of May 06th 2019 to the Director of CDC assigning the Health Information Unit (HIU) and Computer Unit (CU) of the Ministry of Health to provide technical leadership of the process. The objective of the agreement was to put in place the eHealth policy of Cameroon in close collaboration with the Ministry of Health.

0.4 ROADMAP FOR THE DEVELOPMENT OF THE STRATEGIC PLAN

ACTIVITY	SUB-ACTIVITY	EXPECTED OUTCOME	OUTPUT	RESPONSIBLE	TIMEFRAME
1. Establish governance structures to guide eHealth strategic planning process	1.1 CDC presents the project to the Minister of Health	Minister officially recognizes the project	Letter from the Minister recognizing the project, identifying technical lead(s) within MOH	CDC/Cameroon	May-19
	1.2 Meet with Secretary General and two technical leads (HIU and IT Unit) to discuss overview of the proposed project	Shared understanding of the activity and proposed eHealth strategic planning process	SG validates the planning documents for the project, takes ownership of the next steps	CDC/Cameroon	May-19
	1.3 Multi-sectoral engagement of stakeholders	Identify stakeholders	List of key stakeholders	MOH	Jun-19
2. Prioritization of eHealth objectives and reach consensus on strategic planning process	2.1 Elaboration Workshop invitees complete strategic objective prioritization survey online in advance of the first workshop	I-TECH and JHCP prepare snapshot of priorities in advance of the meeting	Summary of survey results	I-TECH, JHCP	Jul-19
	2.2 Elaboration Workshop takes place to: 1) Synthesize landscape analysis and assessments; 2) Prioritize eHealth strategic objectives using the maturity model tool; 3) Elaborate sections of strategic plan, M&E plan and costing plan **(First Workshop)**	Shared understanding of current context and list of prioritized eHealth strategic objectives	Workshop Report	CIS & IT-UNIT I-TECH, JHCP	Jul-19
3. Elaboration of draft of eHealth strategic plan	3.1 Internal Meeting of restrained group of individuals at MINSANTE works on draft 0 of plan	Section of strategic plan with SO's, activities, indicators/KPIs	Trip Report	CIS & IT-UNIT, JHCP	Jul-19
	3.2 Technical assistance to develop the complete draft_1 of the strategic plan document	Strategic plan drafted	Number of stakeholders contributing	JHCP and I-TECH	Jul-19
4. Organize Review Workshop	4.1 **Second workshop** Review and refine draft_1 eHealth strategic plan. Finalize strategic objectives and review activities proposed by TWGs. Define what success looks like for each strategic objective. Identify key performance indicators for each priority activity in the strategic plan. Complete costing activity	Draft_2 eHealth strategic plan available with key performance indicators identified	Number of participants and workshop report	National stakeholders, JHCP	Aug-19
5. Provide TA to the stakeholders during the development of the plan	5.1 Support local partner to establish shared understanding of concepts and principles	Increased capacity for HIS leadership and governance within the MOH	Number of participants and workshop report	I-TECH, JHCP	Aug-19
6. Organize a national eHealth strategic plan Validation Workshop	6.1 **Third Workshop** Review final draft of the eHealth Strategic Plan, including implementation plan, M&E plan and financing plan	Final eHealth strategic plan available including implementation plan, M&E plan and financing plan	Number of slides/resources provided	National stakeholders I-TECH JHCP	Sep-19
7. Move the eHealth Strategic Plan through its validation and adoption	7.1 **Adoption Ceremony** Present the eHealth Strategic Plan to high level stakeholders at a adoption ceremony	Completed eHealth Strategic Plan	Validated plan endorsed and adopted by MOH	National stakeholders, I-TECH, JHCP	Oct-19
	7.2 Convene leads following the adoption of the plan to discuss next steps, the investment strategy, and come to an agreement on what structures will carry the plan from adoption into implementation.	CIS and IT Unit have consensus on next steps	Meeting PV	CIS & IT UNIT	Oct-19

Part 1: Elaboration Workshop

Photo courtesy of JHCP

1.1 ELABORATION WORKSHOP SUMMARY

The process of elaboration was done in closed collaboration with the Head of HIU in seven steps including:

1. Coordination meeting at JHCP for the elaboration workshop
2. Delivery of the first draft of the document
3. Elaboration of the terms of references
4. Delivery of the service note by the Minister of Health
5. Creation of an online storage drive for the project
6. Elaboration workshop, and
7. Debriefing meeting.

Coordination meeting at JHCP

Based on I-TECH orientations and expectations from MOH (HIU, CU), the Regional Director of JHCP (Ubald Tamoufe) organized a meeting to discuss and address administrative, financial and logistics key points in order to ensure the success of the elaboration workshop. With the recommendations of the coordination meeting, while the administration and finance team (Signing Dongmo Gradice) started working on the financial part, Dr Valantine N. Ndze assisted by Leonard Ndongo were in charge to liaise with MOH team to provide and arrange the workshop's program and materials. They were also in charge to motivate the quick delivery of the service note in order to inform the JHCP leadership for the reference of I-TECH HQ.

Delivery of the first draft of the document (Draft 0)

Joanna Diallo in collaboration with JHCP team drafted the strategic initial document and shared with the MOH team for initial review before the elaboration workshop. The maturity model (SOCI) was used for the elaboration of the document as well as WHO, IUT and MINPOSTEL references. About 100 copies in both English and French were printed to prepare the workshop.

Elaboration of the terms of references

Joanna Diallo in collaboration with JHCP team drafted the terms of references for the workshop and shared with the MOH team (HIU, CU) for review and approval. About 150 copies in both English and French were printed to prepare the workshop.

Delivery of the service note by the Minister of Health

Based on the initial draft and terms of reference shared by JHCP, the Head of Health Information Unit (HIU) worked in delivering the service note that legalized the activity in the South Region. A general invitation email sent out to the shortlisted participants by the Head of Health Information Unit to inform about the workshop.

Elaboration workshop, 15-21 July 2019, South Region Ebolowa, Hotel les Destinées

Under the co-supervision of both Heads of Health Information Unit and Computer Unit and the support of I-TECH representative (Joanna Diallo) and JHCP (Dr Valentine N. Ndze assisted by Leonard Ndongo), the 7 day workshop permitted to have the first draft of the strategic plan. The principal tool that guided the methods was the SOCI tool. The main difficulty was the profile of participants but given the panel of experts available, the working sessions (organized by technical working groups) went well. The recommendation was to ensure that before the review workshop, all the participants mastered the SOCI model explained by Joanna. During this workshop, strategic documents were shared as well as the National Strategic Plan for the health sector and the one from the Ministry of Post and Telecommunications named "Cameroon Numeric 2020". Minutes were drafted and shared to stakeholders. Present were participants from: WHO, I-TECH, JHCP, CAMTEL, NEXTTEL, SIGIPES, DLMEP; SIGIPES, ONSP, JEMBI, SG, JEMBI, IAI-Cameroun, DCOOP, DAJC, ART; DAJC, CIS, CI, MINPOSTEL and CI. JHCP Secretariat stored the workgroups documents in the Google drive shared by Joanna.

Creation of online storage drive (Google Drive)

Joanna Diallo created a specific online folder dedicated to the storage of work documents requesting MOH and JHCP team to store their work online so that the review will be easy to do. JHCP team (Dr Valantine N. Ndze, Leonard Ndongo) stored the required documents.

Part 1: Elaboration Workshop

Debriefing meeting at JHCP for the elaboration workshop

Based on the recommendations of the minutes of the elaboration workshop, the Director General of JHCP (Ubald Tamoufe) organized a meeting to discuss and address technical, administrative, financial and logistics reports and challenges of the workshop and anticipated next steps for the review workshop. New orientations helped the team to start working on the preparation of the review workshop.

BEST PRACTICES

- Conduct an eHealth Objectives Prioritization Survey prior to the workshop and allow adequate time to optimize survey response rate
- Use the an eHealth maturity framework to guide the elboration process
- Ensure that all participants have mastered the eHealth maturity framework
- Use the Elaboration Workshop to produce Draft Zero of the strategic plan
- Create an online storage drive to allow access to documents by key members

Photo courtesy of JHCP

1.2 WORKSHOP TO DEVELOP THE STRATEGIC PLAN FOR E-HEALTH IN CAMEROON

WHY A STRATEGIC PLAN FOR E-HEALTH?
JULY 15-23, 2019
EBOLOWA, CAMEROON HOTEL LES DESTINS

1. In general, a strategic plan brings together stakeholders involving different administrations.
2. For eHealth: Digitization phase, Digital Cameroon Plan -- under components (eEducation, eSanté, etc.)
3. For Population with health needs: how to meet those needs and how to improve living conditions for the population
4. Funding alignment (external and internal) in priority activities in eHealth
5. Leadership and governance of eHealth
6. Universal Health Coverage, Population Health
7. Public confidence in the digital system
8. More efficient and secure data exchange when there is a national architecture
9. Patient monitoring in health facilities
10. Global view of health information systems -- subsystem exchange that makes the global system
11. Coordination -- master plan; develops MINSANTE's vision on eHealth
12. Decision based on data -- coordination of actors in the collection of quality data. Rapid detection of diseases.
13. Development of the human resources needed to achieve eHealth -- computer training in Cameroon has begun, now we will have to take the next step

What is eHealth?

- AMS 2015 eHealth resolution
- A practical guide to national eHealth strategies

1.3 TECHNICAL WORKING GROUPS – TERMS OF REFERENCE

Technical working groups were organized into five groups according to the sub-components that were defined by a consortium of international actors as building blocks of a harmonized and optimized health information system. The attributes of each sub-component were:

Management and governance are about ensuring the implementation of the eHealth strategic plan and its follow-up and evaluation plan, establishing the political and legal framework for eHealth, developing guidelines concern eHealth such as security, confidentiality, and privacy of health information, establishing and operating governance structures for eHealth, managing financial resources and multi-sector eHealth investments, and coordinating eHealth activities.

The development of human resources is about developing and maintaining a human resources strategy for eHealth, defining the skills and responsibilities of eHealth at each level of the health system, and managing the management and training of the human resources needed for an optimized health information system.

The ICT infrastructure is about developing, managing, and maintaining the necessary infrastructure for an optimized health information system such as electricity, connectivity, ICT hardware, and networking, developing and circulating standards for eHealth project management such as software development.

Standards and interoperability are about developing and maintaining standards and definitions of health information systems, developing and maintaining standards and guidelines related to data exchange, developing the official and standardized list of digital identification of health facilities, managing Cameroon's medical ontology, developing the national architecture of Cameroon's health information system, managing digital identification of people (such as biometrics).

The quality and use of data is about developing and maintaining data quality control guidelines, developing and maintaining a data use strategy that includes the engagement of health providers and administrators, access to health information, streamlining data collection for workflows in health facilities, supporting decision-making at all levels, and standardizing data storage.

TWGS GOALS

- Develop and validate strategic objectives, sub-goals, initiatives, activities, and monitoring indicators (action plan) for their sub-component using the model developed.
- Provide a draft of their action plan at the end of the workshop.
- Write reports for each day of TWG group work to present each day at the workshop. TWG reports are to be submitted at the end of the workshop.

COMPOSITION OF TWGS

The head of the TWG encourages the active participation of all TWG members. The TWG rapporteur is responsible for:

- Write the report on a daily basis;
- Manage TWG documents and submit them at the end of the workshop.

MEMBERS

Governance

1. CT3/MINSANTE
2. C/CI
3. A Representative of the Minister of Finance
4. A MINEPAT Representative

5. A representative of the Cameroonian Society of Medical Informatics (SOCIM)
6. The Advisor in charge of the African Health Observatory and the World Health Organization's Strategic Information System
7. A Representative of the U.S. Centers for Disease Control and Prevention
8. A representative of the U.S. Development Agency (USAID)
9. A GIZ Representative
10. World Bank Representative, responsible for the PBF programme
11. UNFPA Representative
12. Representative of the World Fund/Global Fund

Human Resources

1. Head of The Department of Computer Science, Yaounde University 1
2. Head of Department of Public Health, Yaounde University
3. Representative of the African Institute of Computer Science
4. CBCHS Representative
5. GHSS representative
6. CARE/CHAMP Representative
7. Chemonics Representative

Infrastructure

1. A representative of the National Agency for Technology, Information and Communication
2. Cameroon Telecommunications Planning and Projects Director (CAMTEL)
3. DND Representative
4. Orange Representative
5. Nexttel representative

Interoperability

1. A Representative of the Minister delegated to Defense (MINDEF);
2. A representative of the Directorate General of National Security (DGSN);
3. Jembi's representative

Health information

1. A representative of the National Observatory of Public Health
2. A Representative for the Fight Against Disease, Epidemics and Pandemics
3. GAVI Representative
4. UCSF representative
5. UNICEF Representative

1.4 WORKSHOP (FACILITATORS') AGENDA

Elaboration Workshop for eHealth Strategic Plan for Cameroon
15-23 July 2019
Ebolowa, Cameroon | Hotel Les Destinees

Day 1: Opening and Current State of eHealth in Cameroon

08:00AM – 09:00AM
Opening

- Introduction of MOH (Dr. Fezeu)
- Introduction of Participants (Dr. Fezeu)
- Workshop Objectives (Joanna)

09:00AM – 09:45AM
Purpose of eHealth Strategic Planning
Why are we doing this? What are the vision and goals for this process?

- Strong use of data and information for clinical and health services management and public health planning
- Effective leadership and governance of HIS
- Robust and efficient flow of data within the health information system
- Incentives for innovation and integration of eHealth into core services
- Stable, sustainable funding for highest priority system improvements and implementations
- Expectations of citizens met for more efficient, effective and personalized services
- Business continuity, trust in system security
- Assurance that eHealth investments deliver according to health priorities.

09:45AM - 10:00AM Pause Café

10:00AM – 12:00PM Where is the Cameroon eHealth Ecosystem Today?
Available assessment results:

- Informatics Savvy Organization Self-Assessment from ILEAD
- Health Data Collaborative Review
- "SNIS Mapping" led by WHO
- UCSF Landscape Analysis using a maturity model framework

Note: summaries for each area from these analyses are in the participant handout

12:00PM - 1:30PM Lunch
Note: 90 minutes is provided for lunch on Day 1. For those who have not completed the pre-workshop exercise, please do so during lunch. Thank you!

1:30PM – 2:30PM
Where is the Cameroon eHealth Ecosystem Today cont.?
Based on the information presented reviewed, facilitate a SWOT analysis, encouraging participant on flip chart paper or electronic capture.

- Strengths/Opportunities:
  - Stakeholder agreement for need to architect and implement an electronic HIS ecosystem to facilitate data use and re-use
  - Ecosystem in early stages with early adopters; systems are basic and still moldable with less investment needed for change management
  - Experience with DHIS2
  - Growing Java and Javascript skills in Cameroon (Buea)
  - Institutional interest in computer programming training
  - Expanding cellular data network ease centralization and exchange
- Challenges/Threats:
  - Low governance and coordination of HIS; relationship building between organizations and departments is needed to ensure high level coordination; roles clarification for governance of national HMIS needed
  - Ecosystem operates as a market-driven approach, implicitly giving decision-making to implementers
  - Small number of HIS developers within IP's, but lacking HIS skills in clinical workforce
  - Ad-hoc design, fragmentation, siloed systems; overlapping functional boundaries of systems; parallel systems duplicating efforts and resources, and a barrier to cohesive data sets; gaps in use case/workflow
  - Low system-based data exchange
  - Licensing/costing considerations

Note: Strengths and Challenges are both internal, opportunities and threats are both external
2:30PM - 2:45PM Pause Café

2:45PM – 4:00PM
Present Survey Results and Set-up Consensus Workshop Exercise for Day 2

- What did this exercise help you realize about eHealth in Cameroon?
  - What was helpful about it, what was unhelpful?
  - Did you learn anything?
- Present summary level results for current state (by question, what was distribution of levels; overall, what was average level)
- Present summary level results for desired state (by questions, what was distribution of levels; overall, what was average level)
- Review documents submitted
- Review some of the comments
  - Why is this relevant? How will we use these results? Explain the consensus workshop exercise planned for Day 2 and how we will attempt to determine which gaps are the most important to address (and therefore the highest priority domains) and how we will try to agree on what the desired state should be for each of the priority domains

4:00PM – 4:30PM Closing

WORKSHOP FACILITATORS' AGENDA

Day 2: Priorities for the Future of eHealth in Cameroon

08:30AM – 08:45AM
Opening (Get settled and Review Agenda)

08:45AM – 09:45AM
Report of Day 1: Current State of the Cameroon eHealth Ecosystem

09:45AM – 10:45AM
Consensus workshop: Identify priority areas for Cameroon's eHealth Strategy

- What are the priorities for each of the three major domains? (30 mins)
  - Begin with participants review their own survey results and what they thought
  - Use survey results and averages/gaps and discuss with the group
  - Any easily excluded/included?
  - What are top three for each participant? Vote.

10:45AM – 11:00AM Pause Café

11:00AM – 12:00PM
Consensus Workshop continued

- What level along the maturity model should be the future state for each priority domain? (30 mins)
  - Discuss and identify what the future state for each priority domain should be

12:00PM – 1:00PM Lunch

1:00PM – 3:00 PM
Introduce Health Information Systems Stages of Continuous Improvement Tool

- Purpose of tool
- What is a maturity model framework? Why is it useful?
- 39 HIS Subcomponents in 5 Core Domains – each of these core domains will be a TWG
- Compare to survey and present mapping of priority strategic objectives from consensus workshop to the SOCI tool
- Review handout and the work each TWG will do

3:00PM – 3:15PM Pause Café

3:15PM – 4:00PM
Assign Participants to TWGs and Review TOR

- Discuss objectives and tasks of each TWG
- Next steps on developing a draft of the strategic plan document

4:00 - 4:30PM – Closing

Day 3: Group Work Begins

08:30AM – 08:45AM
Opening
Get settled and Review of Agenda

08:45AM – 09:45AM
Report of Day 2: Strategic Priorities for eHealth in Cameroon

09:45AM – 10:45AM
Group Work Begins
TWGs begin to review and refine their section of the strategic plan, agreeing on priorities

10:45AM – 11:00AM Pause Café

11:00AM – 12:00PM
Group work continues
TWGs continue review and refinement of their section, agreeing on priorities

12:00PM – 1:00PM Launch

1:00PM – 3:00PM
Group work continues
TWGs continue review and refinement of their section, agreeing on priorities

3:00PM – 3:15PM Pause Café

3:15PM – 17:00PM
Group work continues
TWGs complete review and refinement of their section, agreeing on priorities

17:00PM – Closing

Day 4: Group Work

08:30AM – 08:45AM
Opening: Get settled and Review of Agenda

08:45AM – 09:45AM
Report of Day 3: Progress of TWGs

09:45AM – 10:45AM
Group work continues
Each TWG reaches consensus on what success looks like for each activity

10:45AM – 11:00AM Pause Café

11:00AM – 12:00PM
Group work continues
Identify key performance indicators for each priority activity in the strategic plan

12:00PM – 1:00PM Launch
1:00PM – 3:00PM
Group work continues - Identify key performance indicators for each priority activity in the strategic plan

WORKSHOP FACILITATORS' AGENDA

3:15PM – 17:00PM
Group work continues - Each TWG presents their section of the plan

17:00PM – Closing

Day 5: Group Work

08:30AM – 08:45AM
Opening: Get settled and Review Agenda

08:45AM – 09:45AM
Report of Day 4: TWG Progress Update

09:45AM – 10:45AM
Group work continues - Each TWG presents their section of the plan cont.

10:45AM – 11:00AM Pause Café

11:00AM – 12:00PM
Group work continues - Finalize strategic objectives and review activities proposed by TWG
12:00PM – 1:00PM Launch

1:00PM – 4:00PM
Group work continues
Finalize strategic objectives and review activities proposed by TWG

4:00PM – 4:15PM Pause Café

4:15PM – Closing

Day 6: Costing

08:30AM – 08:45AM
Opening: Get settled and Review of Agenda

08:45AM – 09:45AM
Report of Day 5: Summary of TWG Work

09:45AM - 10:00AM Pause Café

10:00AM - 12:00PM
Each TWG chair presents inputs required for activities

12:00PM - 1:00PM Lunch
1:00PM - 2:30PM
Group work on costs of each strategic area

2:30PM - 2:45PM Pause Café

2:45PM - 4:00PM
Present final costed action plan

4:00PM - 4:30PM
Closing

Day 7

08:30AM – 08:45AM
Opening Get settled and Review of Agenda

08:45AM – 09:45AM
Report of Day 6: Costing

09:45 – 10:00AM Pause Café

10:00AM – 12:00PM
Presentation of draft 1 of the eHealth strategic plan for Cameroon

12:00PM – 1:00PM Launch

1:00PM – 2:00PM
Review and agree on next steps

Part 2: Review Wokshop

2.1 REVIEW WORKSHOP SUMMARY

The process of review was accomplished in six steps including:

1. Coordination meeting at JHCP for the review workshop
2. Review work session by MOH to deliver an advanced draft
3. Elaboration of terms of reference by I-TECH
4. Delivery of the service note
5. The review workshop
6. Debriefing meeting at JHCP for next steps

Coordination meeting at JHCP

Based on I-TECH orientations and expectations from MOH (HIU, CU), the Director General of JHCP (Ubald Tamoufe) organized a meeting to discuss and address administrative, financial and logistics key points in order to ensure the success of the review workshop. With the recommendations of the coordination meeting, while the administration and finance (Signing Dongmo Gradice) started working on the financial part, Dr Valantine N. Ndze assisted by Leonard Ndongo were in charge to liaise with MOH team to provide and arrange the workshop's program and materials. They were also in charge to motivate the quick delivery of the service note in order to inform the JHCP leadership for the reference of I-TECH HQ.

Review work session by MOH to deliver an advanced draft

The MOH reviewed comments from I-TECH and JHCP and based on the recommendations, requested a separate working session to improve the quality of the document. Taking this additional step helped ensure a more productive workshop. The MOH requested that the advanced draft be more closely aligned with the WHO/ITU National eHealth Strategy Toolkit, rather than the SOCI framework, so the MOH leadership and JHCP teams made changes to the organization of content within the draft document to align with this request. The separate team was supported by JHCP Team (Dr Valentine N. Ndze and Leonard Ndongo) for advance review before sharing to MOH. The advanced document reviewed document was approved by MOH and ready for the review workshop. About 150 copies in both English and French were printed to prepare for the workshop.

Elaboration of terms of reference for the review workshop

The I-TECH team in collaboration with JHCP team drafted the terms of references and also provided a couple of observations and comments for the review workshop and shared with the MOH team (HIU, CU) for review and approval.

Delivery of the service note by the Minister of Health

Based on the advanced draft (Draft 1) and terms of reference drafted and shared by JHCP, the Head of Health Information Unit (HIU) worked in delivering the service note for the review that legalized the activity in the South Region. A general email was sent to the shortlisted participants by the Head of Health Information Unit to inform them about the workshop.

Review workshop, 27 - 30 August 2019

The review workshop-coordinated by both heads of the Health Information Unit and Computer Unit with the support of JHCP (Dr Valentine N. Ndze assisted by Leonard Ndongo)-was held at the end of August at the South Region Ebolowa, Florence Hotel. This working session gave the opportunity to define well the main vision, the seven strategic areas (see box below), strategic objectives, specific objectives and task and tentative budget. This four-day workshop resulted in Draft One of the strategic plan that had been submitted to the appreciation of a separate team for more review based on the expectation of the Ministry of Health. This additional process was conducted under the leadership of MOH with the technical assistance of the eHealth specialist consultant.

List of strategic areas

1. Leadership and Governance
2. Legislation, Policy and Compliance
3. Human Resources
4. Strategy and Investments
5. Infrastructure
6. Standards and Interoperability
7. Services and Applications

Part 2: Review Wokshop

The following documents were used :

1. Draft 0 Atelier d'élaboration du plan stratégique national de santé numérique (I-TECH/JHCP)
2. Guide du participant à l'atelier de revue (I-TECH/JHCP)
3. Matrice de formulation des objectifs stratégiques, objectifs spécifiques, activités, taches (CIS)
4. Recommandations on Digital Interventions for Health System Strengthening, Edition 2019 (OMS)
5. Guide OMS pour l'eHealth (OMS)
6. Tableau des opérations financières du Cameroun (TOF, MINEPAT) and
7. Cameroun Numérique à l'horizon 2020 (MINPOSTEL).

Workshop Participants Included:

MINISTRY OF HEALTH

- Secrétariat General (SG)
- Conseiller Technique N°3 (CT3)
- Cellule des Informations Sanitaires (CIS)
- Cellule informatique (CI)
- Cellule de Suivi (CS)
- Cellule de Traduction (CELTRAD)
- Sous-Direction du Solde et de la Paie (SDSP)
- Direction de la Lutte contre la Maladie, les Epidémies et les Pandémies (DLMEP)
- Observatoire Nationale de la Santé Publique (ONSP)
- Cellule de Gestion du projet SIGIPES (Système Informatique de Gestion Intégré du Personnel de l'Etat
- et de la Solde)
- Hôpital de District de Cite-Verte
- Comité National de Lutte Contre le SIDA (CNLS)

OTHER MINISTRIES

- Ministère des Affaires Sociales (MINAS, Cellule de la Coopération)
- Ministère des Postes et Télécommunications (MINPOSTEL)

PUBLIC INSTITUTIONS

- Agence de Régulation des Télécommunications (ART)
- Cameroon Telecommunications (CAMTEL)
- Agence Nationale des Technologies de l'information (ANTIC)
- Ecole Nationale Supérieure Polytechnique (ENSP)
- IAI-Cameroun

CDC AND NON-CDC PARTNERS

- Johns Hopkins Cameroon Program
- CBCHB
- GIZ
- UCSF

Two mains recommendations were issued:

- JHCP to urgently provide the English and French versions, and
- participants to review and share the budget of the planned activity.

BEST PRACTICES

- Engender governmental engagement and ownership of the Draft 0 of the strategic plan, making sure that the content fully aligns with the vision of the HIU and CU of the MOH.
- Continue to build relationships with key units of the MOH.
- Remind participants of the overall process, frameworks, and progress made during earlier steps.
- Using comprehensive frameworks for eHealth, with a maturity orientation, helpe to focus strategic planning on tangible, realistic objectives grounded in the current situation.

Workshop debriefing meeting at JHCP

Based on the recommendations of the review workshop, the Regional Director of JHCP (Ubald Tamoufe) organized a meeting to discuss and address technical, administrative, financial and logistics reports and challenges of the workshop and anticipated next steps for the validation workshop. New orientations helped the team to start working on the preparation of the validation workshop.

2.2 WORKSHOP AGENDA

Cameroon eHealth Strategic Planning Review Workshop Draft Agenda

Day 1

08:30AM – 08:45AM
Opening: Get settled and Review of Agenda

08:45AM – 09:45AM
Review of background

09:45AM – 10:00AM Pause Café

10:45AM – 12:00AM
Review situational analysis and vision

12:00PM – 1:00PM Launch

1:00PM – 3:00PM
Review strategic area 1: Leadership and Governance including M&E plan

3:00PM – 3:15PM Pause Café

3:15PM – 17:00PM
Presentation of reviewed areas (background, situational analysis, vision, leadership and governance)

17:00PM – Closing

Day 2
08:30AM – 08:45AM
Opening: Get settled and Report of day 1

08:45AM – 09:45AM
Review strategic area 2: Management and Workforce

09:45AM – 10:00AM Pause Café

10:45AM – 12:00AM
Review strategic area 3: ICT Infrastructure

12:00PM – 1:00PM Launch

1:00PM – 3:00PM
Review strategic area 4: Standards and Interoperability

3:00PM – 3:15PM Pause Café

3:15PM – 17:00PM
Presentation of reviewed areas

17:00PM – Closing

Day 3
08:30AM – 08:45AM
Opening: Get settled and Report of day 2

08:45AM – 09:45AM
Review strategic area 5: Data Quality and Use

09:45AM – 10:00AM Pause Café

10:45AM – 12:00AM
Review of logical framework, Implementation phases

12:00PM – 1:00PM Launch

1:00PM – 3:00PM
Review of Monitoring and evaluation plan, organigramme and conclusion

3:00PM – 3:15PM Pause Café

3:15PM – 17:00PM P
resentation of reviewed areas

17:00PM – Closing

Part 3: Validation Workshop

3.1 VALIDATION WORKSHOP SUMMARY

The validation process was accomplished in seven steps, including:

1. Coordination meeting at JHCP for the validation workshop
2. Separate edit and cleaning sessions
3. Translation of the documents from French to English
4. Delivery of the service note
5. Meeting with the Informatics Advisor CDC Atlanta
6. The validation workshop itself, and
7. Debriefing meeting.

Coordination meeting at JHCP for the validation workshop

The Regional Director of JHCP organized a meeting to discuss and address administrative, financial and logistics key points to ensure the success of the validation workshop. With the recommendations of the coordination meeting, while the administration and finance (Signing Dongmo Gradice) started working on the financial part, Dr Valantine N. Ndze assisted by Leonard Ndongo were in charge to liaise with MOH team to provide and arrange the workshop's program and materials. They were also in charge to motivate the quick delivery of the service note in order to inform the JHCP leadership for the reference of I-TECH HQ.

Separate edit and cleaning sessions

Several sessions of editing and cleaning of the French version of the document were done respectively by I-TECH, JHCP, HIU, CU to ensure a quality content for the workshop.

Translation of The French documents into English

With the edited and cleaned version of the French version of the strategic document, under the recommendation of the Head of HIU, JHCP contracted with the Translation Unit (CELTRAD) of MOH for the translation of the document from French into English. The copy was shared among MOH, JHCP for I-TECH references.

Preparation of the service note for Validation

Using Draft 1, the Head of Health Information Unit (HIU) prepared the service note for the validation workshop that legalized the activity in the South Region (Kribi). A general email was sent to the shortlisted participants by the Head of Health Information Unit to inform them about the workshop.

BEST PRACTICES

- Build progressively upon each step of the eHealth strategic planning process.
- Ensure development of knowledge and skills of participants related to HIS governance.
- Use validation process to ensure harmony between strategic objectives, logic frame, and budget.

Meeting with the Informatics Advisor at CDC Atlanta on September 18, 2019

The Head of HIU in the presence of Dr Valantine N. Ndze and Leonard Ndongo representing JHCP General Director, received the visit of CDC Atlanta represented by James Kariuki, Informatics Advisor. The purpose of the visit was to: 1) evaluate the progress on the elaboration of the eHealth strategic plan document, 2) appreciate the integration of CDC inputs for the improvement of the current draft, 3) speak about contributors, to discuss about the Adoption Ceremony and explore the perspectives of CDC with the eHealth Strategic plan of Cameroun.

Validation workshop, September 24th – 27th, 2019 South Region, Kribi at Jully Residence Hotel

The head of the health Information Unit presented the overall validation process of the project. The first day, the participants were asked to go through the overall documents and write down their observations. During the workshop, an important issue was raised about the budget. To address this after many discussions, Dr Fezeu recommended to use as reference standard tool for commercial operations that is called "Mercurial".

The representative of MINEPAT advised that it will not be efficient for the budget of the eHealth to be more than the budget of the Minister of Health sector. Considering this will help to interest decision makers at country level and even for partners. So for him it will be good to resize the budget and make it more realistic.

For the review of the budget, participants were organized into two teams, one in charge of strategic area 3 (Human Resources) and the other in area 4 (Strategy and Investments). Each work group validated its work including the budget. This approach was efficient and each working group integrated and validated all observations from CDC Atlanta and I-TECH.

Part 3: Validation Workshop

Photo courtesy of JHCP

Present in the workshop were representatives from following institutions: MOH, MINPOSTEL, MINEPAT, MINCOM, CAMTEL, ART and ANTIC, GIZ, among others. As recommendations, JHCP Team was to proceed with the copy editing of the current versions (FR, EN) and Dr FEZEU and M. BATOUM to work on delivering the service note for the adoption. This compiled chart was approved by all the participants to be integrated in the document.

Workshop Debriefing meeting at JHCP

Based on the recommendations of the validation workshop, the Regional Director of JHCP (Ubald Tamoufe) organized a meeting to discuss and address technical, administrative, financial and logistics reports and challenges of the workshop and anticipated next steps for the adoption workshop. New orientations helped the team to start working on the preparation of the adoption workshop.

3.2 WORKSHOP AGENDA

Cameroon eHealth Strategic Planning Validation Workshop Draft Agenda
Coordination: MOH/I-TECH/JCHP

Day 1
08:30AM – 08:45AM
Opening: Get settled and Review of Agenda

08:45AM – 09:45AM
Validate: Background, situational analysis and vision

09:45AM – 10:00AM Pause Café

10:45AM – 12:00AM
Validate strategic area 1: Leadership and Governance

12:00PM – 1:00PM Launch

1:00PM – 3:00PM
Validate strategic area 2: Management and Workforce

3:00PM – 3:15PM Pause Café

3:15PM – 17:00PM
Validate strategic area 3: ICT Infrastructure

17:00PM – Closing

Day 2
08:30AM – 08:45AM
Opening: Get settled and Report of day 1

08:45AM – 09:45AM
Validate strategic area 4: Standards and Interoperability

09:45AM – 10:00AM Pause Café

10:45AM – 12:00AM
Validate strategic area 5: Data Quality and Use

12:00PM – 1:00PM Launch

1:00PM – 3:00PM
Validate logical framework, Implementation phases

3:00PM – 3:15PM Pause Café

3:15PM – 17:00PM
Validate Monitoring and evaluation plan, organigramme and conclusion

17:00PM – Closing

Day 3
08:30AM – 08:45AM
Opening: Get settled and Report of day 2

08:45AM – 09:45AM
Map out next steps outlined in implementation plan

09:45AM – 10:00AM Pause Café

10:45AM – 12:00AM
Establish a timeline for next steps

12:00PM – 1:00PM Launch

1:00PM – 1:30PM Final validation

Part 4: Adoption of EHealth National Policy

Photo courtesy of JHCP

4.1 SUMMARY OF THE ADOPTION OF EHEALTH NATIONAL POLICY

Based on the recommendation of the validation workshop, the adoption process was accomplished in nine steps including:

1. Coordination meeting at JHCP for the adoption ceremony
2. Final editing and cleaning sessions
3. Final review of the translation of the two versions (French and English)
4. Design the document and material (agenda, brochure, etc.)
5. Elaborate terms of reference and invitations for the Minister to sign
6. Delivery of the service note
7. Logistics
8. The adoption ceremony itself, and
9. Debriefing meeting.

Coordination meeting at JHCP for the adoption ceremony

Based on I-TECH orientations and expectations from MOH (HIU, CU), the Regional Director of JHCP (Ubald Tamoufe) organized a meeting to discuss and address administrative, financial and logistics key points in order to ensure the success of the adoption ceremony. With the recommendations of the coordination meeting, while the administration and finance (Signing Dongmo Gradice) started working on the financial part, Dr Valantine N. Ndze assisted by Leonard Ndongo were in charge to liaise with MOH team to provide and arrange the ceremony program and materials. They were also in charge to motivate the quick delivery of the service note in order to inform the JHCP leadership for the reference of I-TECH HQ.

Panel of members of the technical committee, from right to left, GIZ Representative, Head of HIU (Dr Fezeu), Head of CU (Mr Batoum), Director General JHCP (Mr Ubald Tamoufe), Principal Investigator of the project (Dr Valantine Ngum Ndze), eHealth specialist Consultant (Mr Leonard Ndongo). Photo courtesy of JHCP.

Interview of the Minister of Health, Dr Manaouda Malachie, behind from left to right Minister Delegate of Public Health, WHO Representative, UNFPA Representative and Representative of the Minister of Social Affairs. Photo courtesy of JHCP.

Editing and cleaning sessions

Based on the comments and observations of I-TECH (Joanna Diallo, Nancy Puttkammer) and CDC (James Kariuki), JHCP team (Dr Valentine N. Ndze assisted by Leonard Ndongo) worked on providing the necessary inputs in terms of editing and cleaning that was issued for the final and approved document by MOH.

Final review of both the French and English versions

On behalf of the Regional Director of JHCP (Ubald Tamoufe), Dr Valentine N. Ndze and Leonard Ndongo reviewed carefully the translation of the two versions. These two versions were shared to stakeholders for information. MOH team (HIU, CU) appreciated the documents and considered these versions as final.

Design the document and materials

Based on the final versions of the document, the Head of Computer Unit with the assistance of Dr ValentineN. Ndze and Leonard Ndongo made the design of the documents and list of guests, agenda and the brochure. The Regional Director of JHCP (Ubald Tamoufe) validated the work done and communicated to I-TECH for their reference.

Elaborated terms of reference and invitations for Minister to sign

The Head of CU elaborated the Terms of Reference and the invitation letters in close collaboration with JHCP team (Ubald, Valentine, Leonard). All the invitations were signed by the Minister confirming the date of January 16th, 2020 for the adoption.

Delivery of the service note

Based on the validated materials, the Head of Computer Unit (HIU) worked in delivering the service note and the invitations signed for the adoption ceremony that legalized the activity in the Centre Region (Hilton Hotel initially). A general email was sent to the shortlisted participants by the Head of Computer Unit to inform about the Ceremony.

Confirm logistics

Based on the service note and invitations signed, on behalf of the Regional Director of JHCP (Ubald Tamoufe), the administration and finance team (Signing Dongmo Gradice) confirmed with the Head of Computer Unit, the reservation at Mont Febe because Hilton Hotel was occupied at the solicited date. A general email was sent to the shortlisted participants by the Head of Computer Unit to inform about the modification of the place.

Adoption ceremony on January 16th, 2020 at Mont Febe Hotel in Yaoundé

Since December 2019, the Head of Computer Unit with the assistance of JHCP team (Leonard Ndongo assisting Dr Valentine N. Ndze) worked to design and validate the following materials: Participants list, Invitations, Terms of References, Brochure, design of the main document, roll-ups in both English and French versions. Once these was finalized, the date was approved by the Minister of health for January 16th, 2020 through the letter # E71-01/L/MINSANTE/SG/CI, JHCP (Signing Gradice) took all the dispositions to secure a hall at Hilton but unfortunately the whole hotel was busy. We finally got an available place at Mont Febe hotel in Yaounde. More than 100 people attended thje ceremony.

Recommendations of the Adoption

DMOH: The Minister of Health strongly recommended that the partners of the Ministry of Public Health should use this document as reference.

Dr Judith Shang, standing for the CDC Country Representative. Photo courtesy of JHCP

The panel of High Guests, from left to right, Representative of UNFPA, Minister Delegate of public Health, Minister of Health, Representative of WHO, Representative of Minister of Social Affairs, Representative of CDC. Photo courtesy of JHCP.

Debriefing meeting for the Adoption Ceremony

Based on the recommendations of the adoption, the Regional Director of JHCP (Ubald Tamoufe) organized a meeting to discuss and address technical, administrative, financial and logistics reports and challenges of the ceremony and anticipate next steps.

Key Institutions Present Included:

- Minister of Public Health
- Minister Delegate to the Minister of Public Health in charge of Epidemics and Pandemics
- Representative of the Ministry of Posts and Telecommunications
- Representative of the Ministry of Economy, Planning and Regional Development (MINEPAT)
- Representative of the Ministry of Social Affairs (MINAS)
- Telecommunications Regulatory Board of Cameroon (ART)
- National Agency for Information and Communication (ANTIC)
- Representatives of MTN Cameroon, Orange Cameroon, CAMTEL
- Representative of National Advanced School of Engineering,Yaounde (ENSP)
- Representative of African Institute of Computer Sciences
- CDC Representative (Dr Judith Shang)
- WHO Representative
- UNFPA Representative
- World Bank Representative
- GIZ
- JHCP Representatives
- Implementing partners (ICAP, Georgetown etc)
- Senior Directors and Inspectors of the MOH

Appendices

5.1 ADOPTION WORKSHOP, PARTICIPANT OVERVIEW OF THE NATIONAL EHEALTH STRATEGIC PLAN (2 PAGES)

5.2 CAMEROON EHEALTH STRATEGIC PLANNING, ELABORATION WORKSHOP, PARTICIPANT HANDOUT (34 PAGES)

5.3 STRATEGIC OBJECTIVES PRIORITIZATION TOOL (3 PAGES)

5.4 COSTED ACTION PLAN, GROUPE 1 (2 PAGES IN FRENCH)

5.5 THE 2020-2024 NATIONAL DIGITAL HEALTH STRATEGIC PLAN FOR CAMEROON (74 PAGES)

ADOPTION WORKSHOP
PARTICIPANT OVERVIEW OF THE CAMEROON NATIONAL EHEALTH STRATEGIC PLAN

STRATEGIC AREA 5 :
SERVICES AND APPLICATIONS

STRATEGIC OBJECTIVE 5 : by 2024,

Develop services and applications that meet the needs of individuals, healthcare providers, managers and administrators of health facilities.

- **SPECIFIC OBJECTIVE 5.1 : by 2024,**
Establish a UHC information management systemin 50% of health facilities.

- **SPECIFIC OBJECTIVE 5.2 : by 2024,**
Set up a national integrated computer management system in 70% of health facilities.

- **SPECIFIC OBJECTIVE 5.3 : by 2024,**
Develop telemedicine and mobile applications for the community, patients and service providers, and health care.

STRATEGIC AREA 6 :
INFRASTRUCTURE

STRATEGIC OBJECTIVE 6 : by 2024,

Develop health information processing and sharing infrastructure between health structures and communities at the national and international levels.

- **SPECIFIC OBJECTIVE 6.1 : by 2022,**
Ensure the availability of quality physical technological infrastructure in 70% of targeted health facilities.

- **SPECIFIC OBJECTIVE 6.2 : by 2023,**
Ensure availability of cloud-based platforms or services in 70% of targeted health facilities.

STRATEGIC AREA 7 :
STANDARDS AND INTEROPERABILITY

STRATEGIC OBJECTIVE 7 : by 2024,

Develop standards and interoperability components to improve the collection and exchange of consistent and accurate health information across geographical and sectoral boundaries.

- **SPECIFIC OBJECTIVE 7.1 : by 2022,**
Ensure the availability and application of ICT standards in 80% of health facilities at all levels of the health pyramid.

- **SPECIFIC OBJECTIVE 7.2 : by 2022,**
Ensure the interoperability of IT systems in 80% of health facilities at all levels of the health pyramid.

DIGITAL HEALTH INTERVENTIONS

- Stock notification and product management
- Telemedicine from provider to client
- Telemedicine from provider to provider
- Communication with targeted customers
- Monitoring of the health status of patients / clients
- Support and decision-making aid for health workers
- Supplying of training and education content for health workers.

COST OF IMPLEMENTING THE NATIONAL DIGITAL HEALTH STRATEGY

The PSNSN 2020-2024 aims to correct the main difficulties facing our system of health, such as geographic inaccessibility, low request for services, delay in providing care, poor compliance with clinical protocols and costs borne by individuals. To achieve this objective, an amount of 11,327,570,000 FCFA is required for the next coming five years, i.e. 19,037,933 US dollars.

EDITORIAL TEAM

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This **National Strategic Digital Health Plan** is the result of a process started since June 2018 thanks to technical and financial support from **Centers for Disease Control and Prevention (CDC) and I-TECH / University of Washington.**

REPUBLIQUE DU CAMEROUN
Paix - Travail - Patrie
MINISTÈRE DE LA SANTÉ PUBLIQUE

REPUBLIC OF CAMEROON
Peace - Work - Fatherland
MINISTRY OF PUBLIC HEALTH

MOH

THE 2020 - 2024 NATIONAL DIGITAL HEALTH STRATEGIC PLAN

VISION

The vision is to ensure that by 2024, digital health contributes effectively to **Universal Health Coverage (UHC)**, through informed decision-making at all levels of the health pyramid, through reliable, robust, secured and interoperable systems.

GENERAL OBJECTIVE

By 2024, improve the performance of the health system through optimal use of effective digital technologies at all levels of the health pyramid.

METHODOLOGICAL APPPROACH

Two approaches have been used to describe the present situation of digital health in Cameroon.

- **Desk study**
- **Interactive discussions with key players in the health system during workshops organized for this purpose**

KEY DEVELOPMENT PLAYERS

- **Health Information System (SIS) Specialists**
- **High level experts**

REFERENCE DOCUMENTS USED

The main reference documents used to describe the state of digital health are :

- **The Health Sector Strategy 2016 - 2027;**
- **The Cameroon digital 2020 strategic plan;**
- **The Health Information System (HIS) evaluation report from Cameroon;**
- **The mapping of information subsystems and investments in the NHIS in Cameroon**
- **The self-assessment of computerized organizations**
- **The National eHealth Strategy Toolkit on Cyber Health**
- **The Cameroon Strategic Planning Guide 2012's Edition.**

STRATEGIC AREA 1 : LEADERSHIP AND GOVERNANCE

STRATEGIC OBJECTIVE 1 : by 2024,
Improve governance and leadership in eHealth.

- **SPECIFIC OBJECTIVE 1.1 : by 2021,**
Establish a national committee to supervise and coordinate eHealth activities.

- **SPECIFIC OBJECTIVE 1.2 : by 2024,**
Define processes and procedures to ensure compliance of eHealth interventions with standards, policies and the legislative and regulatory framework.

- **SPECIFIC OBJECTIVE 1.3 : by 2024,**
Develop and disseminate the eHealth clinical safety policy document, including the legislative and regulatory framework for digital health.

- **SPECIFIC OBJECTIVE 1.4 : by 2024,**
Have a strategic document for the management of availability, incidents, accessibility, service delivery and change.

- **SPECIFIC OBJECTIVE 1.5 : By 2020,**
Develop a Monitoring/Evaluation Plan for the implementation of the eHealth Strategic Plan.

STRATEGIC AREA 2 : LEGISLATION, POLICY AND COMPLIANCE

STRATEGIC OBJECTIVE 2: by 2024,

Strengthen the eHealth legal and regulatory framework.

- **SPECIFIC OBJECTIVE 2.1 : by 2024,**
Improve policy and ethics in eHealth.

- **SPECIFIC OBJECTIVE 2.2 : by 2024,**
update and draft the instruments required to create an appropriate legal and institutional environment for partnership and contractual relations in eHealth.

STRATEGIC AREA 3 : HUMAN RESOURCES

STRATEGIC OBJECTIVE 3 : by 2024,

Develop quantitative and qualitative human resources needed for digital health implementation.

- **SPECIFIC OBJECTIVE 3.1 : by 2020,**
Assess the quantity and quality needs of health personnel whoare to use the eHealth system.

- **SPECIFIC OBJECTIVE 3.2 : by 2022,**
Have target personnel trained in the use of the computer tool.

- **SPECIFIC OBJECTIVE 3.3 : by 2024,**
Have at least one ICT specialist in every district hospital.

- **SPECIFIC OBJECTIVE 3.4 : by 2022,**
Have at least 10 eHealth application developers and 10 system administrators at the central level.

STRATEGIC AREA 4 : STRATEGY AND INVESTMENT

STRATEGIC OBJECTIVE 4 :By 2024,
Strengthen investment and financing of eHealth.

- **SPECIFIC OBJECTIVE 4.1 :**
Ensure the mobilization of national resources to finance the provision of eHealth services.

- **SPECIFIC OBJECTIVE 4.2 :**
Strengthen national and international partnership for eHealth

- **SPECIFIC OBJECTIVE 4.3 :**
Establish a Digital Health Investment Fund

CAMEROON EHEALTH STRATEGIC PLANNING ELABORATION WORKSHOP
PARTICIPANT HANDOUT

Cameroon eHealth Strategic Planning Elaboration Workshop

15-23 July 2019

Ebolowa, Cameroon | Hotel Les Destinees

Participant Handout

Content Adapted from:
Public Health Informatics Institute. 2019. "Informatics Savvy Health Department Tool Kit." Accessible from https://www.phii.org/info-savvy/self-assessment-tools;
MEASURE Evaluation. 2019. "Health Information System (eHealth) Stages of Continuous Improvement (SOCI)." Accessible from https://www.measureevaluation.org/eHealth-strengthening-resource-center/eHealth-stages-of-continuous-improvement-toolkit

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Strategic Area I: Leadership and Governance

Strategic Objective I.A eHealth Strategy **TWG: Leadership and Goverance**

SOCI Subcomponent(s):

1. HIS Strategic Planning

Current Status: Cameroon does not have a comprehensive eHealth Strategy to drive the development of the eHealth ecosystem to achieve efficiency, effectiveness, and alignment. Various partners and donors drive the development of systems to respond to specific program needs rather than aligning to a national vision for eHealth and health information systems.

Desired State (You): _____ **Desired State (Group): _____**

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective I.A eHealth Strategy

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Establish review process for eHealth strategic plan	*eHealth TWG*	*Materials, venue and per diem for meetings*	*eHealth strategic plan is reviewed annually, yes/no*	*Annual review process*	*Phase 1*
Reference eHealth strategic plan in regional budgets	*Regional Directorate*	*Planning Session*	*% of budgets mentioning eHealth strategic plan*	*50% by 2021*	*Phase 2*
Establish a tracking system on the implementation of electronic medical records, laboratory information systems, and pharmacy information systems within public-sector health institutions in Cameroon and is updated semi-annually	*eHealth TWG*	*Salary for individual or consultant developing the system, training, SOP development*	*% of districts reporting on presence of each type of clinical information system at health facilities within their jurisdiction*	*75% reporting semi-annually by 2021*	*Phase 2*

Strategic Objective I.B: eHealth Monitoring and Evaluation Plan **TWG: Leadership and Goverance**

SOCI Subcomponent(s):

1. Monitoring & Evaluation Plan

Current Status: The *National M&E Plan, 2016-2020* includes the MOH's IMEP/PISE 2016-2020 that defines the organizational framework for M&E, defines roles and responsibilities, data flow within the health system, and supervisory roles; however, as of October 2017, the policy was not fully operational.

Desired State (You): _____ **Desired State (Group): _____**

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective I.B: eHealth Monitoring and Evaluation Plan

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Create standard processes for evaluating eHealth activities	*eHealth TWG*	*Materials, venue and per diem for meetings*	*% of eHealth activities evaluated using standard processes*	*60$ by 2022*	*Phase 3*

Strategic Objective I.C: Policy, Legal, and Regulatory Framework and Compliance TWG: Leadership and Goverance

SOCI Subcomponent(s):

1. Existence of HIS policies and legislation
2. Policy compliance enforcement

Current Status: A number of documents exist to inform HIS policy, legislation, and compliance including the MINSANTÉ Plan Intégré de Suivi Evaluation (PISE), 2016-2020 (National M&E Plan, 2016-2020) and MINSANTÉ Strategie Sectorielle de Santé, 2016-2027 (National Sectorial Health Strategy, 2016-2027). The Universal Health/Insurance Policy creates a unique identifier code nationally. There is little guidance provided from a central level to lower levels to help regions and districts implement policy. There appears to lack any monitoring of compliance with policy directives.

Desired State (You): _____ **Desired State (Group):** _____

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective I.C: Policy, Legal, and Regulatory Framework and Compliance

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Develop and disseminate a national data security policy covering physical and electronic data security measures and standard procedures	*IT Unit*	*Convene committee to develop the policy*	*Policy developed, adopted and circulated, yes/no*	*Policy circulated by 2020*	*Phase 1*
Establish and implement in district health offices a compliance framework for the national data security policy	*IT Unit*	*Develop and disseminate tools to track compliance*	*% of districts conducting data security reviews*	*75% of districts completing at least 3 data security reviews by 2022*	*Phase 2*

Strategic Objective I.D: Confidentiality and Informed Consent **TWG: Leadership and Goverance**

SOCI Subcomponent(s):

1. N/A

Current Status: There are a national ethics for research on human health and also institutional review boards that promote biomedical and health ethics in the country but the country has no legal and ethical framework for eHealth.

Desired State (You): _____ **Desired State (Group): _____**

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective I.D: Confidentiality and Informed Consent

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Draft confidentiality policy	*MINSANTE DRH*	*Policy development committee*	*Policy developed, adopted and circulated, yes/no*	*Policy circulated by 2020*	*Phase 1*

Strategic Objective I.E: eHealth leadership and governance organizational structures and functions

TWG: Leadership and Goverance

SOCI Subcomponent(s):

1. HIS Leadership and Coordination
2. HIS Organizational structure and functions

Current Status: While there are structures within the MOH that have clear mandates related to eHealth, there are no governance structures to lead planning and compliance processes and coordinate across the MOH directorates and sub-directorates.

Desired State (You): _____ Desired State (Group): _____

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective I.E: eHealth leadership and governance organizational structures and functions

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Establish a charter for a standing inter-ministerial eHealth technical working group, with documented organizational structure and description of organizational roles	*MINSANTE IT Unit and CIS*	*Per diem for participants, meeting space, refreshments for 1-day meeting*	*Chartered eHealth TWG exists and is reviewed and endorsed on an annual basis, yes/no*	*Charter for eHealth TWG created by 2020*	*Phase 1*
Create a schedule for the inter-ministerial eHealth technical working group meetings to review progress against M&E indicators within the eHealth strategic plan	*MINSANTE IT Unit and CIS*	*Per diem for participants, meeting space, refreshments for 1-day meeting*	*eHealth TWG meets semi-annually, yes/no*	*2 meetings in 2020 and 2 meetings in 2021; donor funding commitment to support on-going eHealth technical working group*	*Phase 1*

Strategic Objective I.F: Informatics Focal Point at the Ministry of Health **TWG: Leadership and Goverance**

SOCI Subcomponent(s):

1. N/A

Current Status: The Cellule Informatique/IT Unit of the MOH is mandated to lead the development of directives for health information systems. At the same time, the Cellule d'Information Sanitaire/Health Information Unit has taken a leadership role in the visioning of a unified health information system whereby

data are collected at all levels of the health system and fed into a single data warehouse at the central level. Both units are the lead agencies in the eHealth Strategic Planning process.

Desired State (You): _____ Desired State (Group): _____

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective I.F: Informatics Focal Point at the Ministry of Health

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Informatics focal point within MINSANTE convenes monthly TWGs to coordinate informatics work across departments, programs, and agencies within the ministry	*IT Unit* *CIS*	*Refreshments* *Per Diem*	*% of months during which a TWG is held each year*	*83% (10/12) of planned TWG meetings take place in 2020*	*Phase 1*

Strategic Objective I.G: eHealth Financial Management **TWG: Leadership and Goverance**

SOCI Subcomponent(s):

1. HIS Financing Plan
2. Resource Mobilization

Current Status: Cameroon has not developed a funding plan for eHealth in the country but most funding for eHealth activities are sporadic and mainly from non-public local donations or from international donors. The government and the private sector have invested in ICT infrastructure that can be used to support health care and particularly eHealth.

Desired State (You): _____ **Desired State (Group):** _____

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective I.G: eHealth Financial Management

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
National eHealth technical working group endorses a unified resource mobilization plan, which is shared with bilateral and multilateral donors	*eHealth TWG*	*Workshop venue, per diem, refreshments, adoption ceremony*	*Unified resource mobilization plan is developed, yes/no*	*Initial plan by September 2019*	*Phase 1*
Unified resource mobilization plan is updated annually in conjunction with review of the strategic plan	*eHealth TWG*	*Annual Review Workshop costs*	*Unified resource mobilization plan is updated annually*	*Annual updates completed in 2020-2024*	*Phase 2-3*

Strategic Area II: Skilled Workforce

Strategic Objective II.A: Workforce Strategy **TWG: Human Resources**

SOCI Subcomponent(s):

1. N/A

Current Status: Only initial and isolated ad hoc efforts to develop an eHealth workforce strategy have occurred through the planning efforts related to specific systems including DHIS2 and EMR.

Desired State (You): _____ **Desired State (Group):** _____

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective II.A: Workforce Strategy

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Establish plans for recruiting, hiring and/or developing existing staff to meet health informatics needs	*MINSANTE DRH*	*Assessment of health informatics human resources needs*	*At national and regional levels, annual action plan for recruiting, hiring and/or developing existing staff exists, yes/no*	*75% of regions have annual action plan by 2021*	*Phase 2*

Strategic Objective II.B: Workforce Capacity and Development **TWG: Human Resources**

SOCI Subcomponent(s):

1. HIS competencies (knowledge, skills, and abilities)
2. HIS training and education (includes continual professional development)
3. HR Policy

Current Status: A major focus of health workforce capacity building for HIS has been for DHIS2. This has helped contribute to a culture of data use and analysis. However, most staff do not receive training in statistics or epidemiology. IT capacity revolves around a concentration of Java programmers at the University of Buea. There lacks a formal assessment and definition of the skills and competencies required to support the growing eHealth ecosystem. Similar to how the systems are designed, developed, and evolve, training focuses on specific program needs driven by specific donors and partners and is ad-hoc rather than systematic.

Desired State (You): _____ **Desired State (Group): _____**

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective II.B: Workforce Capacity and Development

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Describe HIS-related job titles, competencies, qualifications and responsibilities within standardized job descriptions for each level of the health system hierarchy	*MINSANTE DRH*	*Meeting to review job descriptions*	*HIS-related job titles, competencies, qualifications and responsibilities appear in standardized job descriptions, yes/no*	*Standardized job description for Facility-Based Health Information Specialist, District Health Information Officer, Regional Health Information Officer developed by 2020*	*Phase 1*
Review standardized job descriptions for each level of the health system hierarchy annually	*MINSANTE DRH*	*Meeting to review job descriptions*	% of job descriptions that are reviewed annually	*90% by 2022*	*Phase 2-3*
Create a tracking system for tracking HIS-related staffing allocations and vacancies at district levels	*MINSANTE DRH*	*Enhance HRIS*	*% of districts participating in a national human resource information system (HRIS) for public sector health care, which includes HIS-related cadres and positions*	*75% of districts track data on Facility-Based Health Information Specialist role and District Health Information Officer role within HRIS by 2021*	Phase 2

Strategic Objective II.C: ICT Management Capacity **TWG: Human Resources**

SOCI Subcomponent(s):

1. N/A

Current Status: Within MINSANTE, the IT Unit is home to the ICT management capacity for the health system. Due to the emphasis on DHIS2, the National AIDS Control Committee (NACC) has developed ICT Management Capacity with an eye towards interoperability. MINPOSTEL leads ICT planning and development. The University of Yaoundé's Informatics Department is establishing a data center to be able to host applications on a local cloud services architecture. Much of the ICT Management Capacity in Cameroon is in local, private firms.

Desired State (You): _____ **Desired State (Group):** _____

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective II.C: ICT Management Capacity

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Connect students with opportunities within the IT Unit and MINSANTE to manage ICT activities	*IT Unit, University of Yaoundé*	*Stipends*	*# of students offered opportunities*	*5 by 2022*	*Phase 2*

Strategic Area III: Effectively Used and Well-Designed Systems

Strategic Objective III.A: ICT Infrastructure **TWG: ICT Infrastructure**

SOCI Subcomponent(s):

1. Reliable Power and Electricity
2. ICT business Infrastructure support
3. Hardware
4. Communication network (LAN and WAN): Networks and Internet connectivity

Current Status: There is insufficient hardware, networking, and software at health facilities and district offices. Both electricity and internet connectivity are intermittently available or difficult to manage. Health facilities find IT maintenance burdensome without a centralized structure in place to provide support.

Desired State (You): _____ **Desired State (Group):**
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What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective III.A: ICT Infrastructure

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
MINSANTE IT Unit establishes standard metrics for measuring power outages and the duration of outages	*IT Unit*	*Meeting space, per diem*	*# of Standard metrics developed, defined, and communicated to regional and district levels*	*3*	*Phase 1*
National eHealth TWG endorses framework for guiding investments in reliable power for health care sites in conjunction with Universal Health Coverage goals	*eHealth TWG*		*Framework used to guide public investment, yes/no*	*Framework disseminated to regions and districts*	*Phase 2*

Strategic Objective III.B: Health Informatics Project Management **TWG: ICT Infrastructure**

SOCI Subcomponent(s):

1. Software Lifecycle Support
2. Business continuity processes and policies

Current Status: Specific projects use standard technical project management and software development lifecycle processes (DHIS2, EMR, DAMA) however there is no standardized process used across projects in Cameroon. There is not currently a structure in place to enforce compliance with a standard should it be established.

Desired State (You): _____ **Desired State (Group): _____**

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective III.B: Health Informatics Project Management

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Establish standard project management procedures for information technology projects in a best-practice guide	*IT UNIT*	*Consultant to create best practice guide, training costs*	*Best practice guide for information technology project management exists, yes/no*	*Guide created and disseminated as online resource by 2020*	*Phase 1*

Strategic Objective III.C: Standards and Interoperability **TWG: Standards and Interoperability**

SOCI Subcomponent(s):

1. HIS standard guidelines
2. Data set definitions (clinical and indicator)
3. Data and exchange standards (internal and external)

Current Status: Cameroon health information systems do not currently meet international standards for the electronic exchange of health data. Functional boundaries between systems are not defined. There are no system architecture guidelines to ensure new systems adhere to standards.

Desired State (You): _____ **Desired State (Group): _____**

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective III.C: Standards and Interoperability

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
National standards and guidelines for electronic medical record systems, laboratory information systems, and pharmacy information systems are adopted, including standard taxonomies and data exchange formats	*IT Unit*	*Workshop*	*Standards adopted and disseminated*	*Standards adopted by 2021*	*Phase 2*

Strategic Objective III.D: Data Exchange **TWG: Standards and Interoperability**

SOCI Subcomponent(s):

1. Person data exchange
2. Aggregate data exchange
3. Commodity management data exchange
4. Data exchange security

Current Status: Most data flows unidirectionally from the facilities to the central MOH. There are gaps in data exchange and there is no integrated data repository for the country.

Desired State (You): _____ **Desired State (Group):** _____

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective III.D: Data Exchange

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Map the types of data currently being exchanged within and between systems	*CIS*	*Consultant stipend*	*Report on the types of data being exchanged between the systems produced, yes/no*	*Report submitted by mid-2020*	*Phase 1*
Establish SOP on data security standards and provide training	*IT Unit*	*Training costs*	*# of individuals trained on data security best practices*	*100 by 2021*	*Phase 2*

Strategic Objective III.E: Shared Services **TWG: Standards and Interoperability**

SOCI Subcomponent(s):

1. Master facility list
2. Indicator registry
3. Terminology management
4. Unique person identity management
5. Enterprise architecture

Current Status: With the drive towards Universal Health Coverage, there are efforts to adopt a national unique identifier, though there remain challenges to nationwide adoption and use. DHIS2 includes a master facility list; however, it needs to be reconciled with other facility lists maintained by various MOH entities.

Desired State (You): _____ **Desired State (Group):** _____

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

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Example Action Plan for Strategic Objective III.E: Shared Services

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Create and disseminate the Master Facility List	*MINSANTE SG*		*MFL exists and accessible online, yes/no*	*MFL accessible online by 2020*	*Phase 1*
Establish standard terminology management system	*IT Unit*	*Workshop costs*	*Terminology data is stored centrally and easily sharable with systems, yes/no*	*Terminology management system exists by 2022*	*Phase 2*

Strategic Objective III.F: Data Quality and Use **TWG: Data Quality and Use**

SOCI Subcomponent(s):

1. Data quality assurance and quality control
2. Data management
3. Data use availability strategy
4. Information/data availability
5. Data use competencies
6. User/stakeholder engagement
7. Data synthesis and communication
8. Reporting and analytics features
9. Data use impact
10. Data collection alignment with workflow
11. Decision support (clinical or other)

Current Status: The National Health Data Observatory is responsible for disseminating health information, largely collected at the facility level. However, there is less use of the data at the facility itself. For the health sector, the National Public Health Observatory leads the research efforts for surveillance and evaluation of the health system.

Desired State (You): _____ **Desired State (Group):** _____

What Gaps Need to be Addressed to Reach Desired State?

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What Strengths and Opportunities will Facilitate Reaching the Desired State?

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Key Stakeholders:

Example Action Plan for Strategic Objective III.F: Data Quality and Use

Activity	Organizational Lead	Resources Needed	Indicator	Target	Timeline
Review national data collection processes and tools	*CIS*	*Consultant stipend*	*% of data collection processes and tools that align with workflows*	*85% by 2021*	*Phase 2*

STRATEGIC OBJECTIVES PRIORITIZATION TOOL

Cameroon eHealth Strategic Objectives Prioritization Tool

This tool is intended for use by a Strategic Planning steering committee to establish the strategic objectives to include in the strategic planning process. The steering committee can individually complete the tool and then compile scores to reach a consensus on what are the largest gaps between "as-is" and "to be" levels and the highest priorities areas for the country. It is recommended to use this tool before completing a more granular assessment of activities and metrics to meet the strategic objectives over a five-year period. The tool employs a maturity model concept and each of the levels is a continuation and an add-on of the previous level.

Strategic Area	#	Strategic Objective	Question	Level 0: Absent	Level 1: Emerging	Level 2: Developing	Level 3: Defined	Level 4: Institutionalized	Level 5: Optimized	Score
Leadership and Governance	I.A	eHealth Strategy	Do we have a defined, documented and adopted eHealth Strategy?	There is no eHealth strategy	There is an awareness of the need for an HIS Strategy and M&E Plan for eHealth	Strategic plans are drafted or in various states of completion and adoption and are siloed within specific sub-domains of eHealth.	There is an established strategic plan that is adopted officially by the government and in which all relevant stakeholders within the Ministry of Health, Ministry of Telecommunications, Ministry of Finance, Ministry of Education, and other relevant government agencies participated in developing.	A budgeted eHealth strategy is aligned with and integrated in the national health plan/strategy. Alignment and integration are monitored by the eHealth governing body.	A continuous improvement process for strategic planning is maintained based on evluation of strategic alignment. The eHealth governing body aims to optimize resource allocation and project future eHealth investments.	
Leadership and Governance	I.B	eHealth Monitoring and Evaluation Plan	Does the adopted eHealth strategy have a Monitorng and Evaluation Plan?	There is no monitoring and evaluation plan for the eHealth strategy	There is awareness of the need to monitor and evaluate HIS and ICT activities to ensure alignment with the eHealth strategy and compliance with standards and guidelines	Narrow-focused strategic plans use ad hoc monitoring and evaluation processes to assess progress towards stated objectives and lack institutional support	The eHealth strategic plan includes an M&E plan however, metrics are only collected periodically to assess progress towards strategic objectives	Implementation of the budgeted eHealth strategy is monitored, and there is a set schedule for periodic review and update for corrective action by a designated eHealth governing body	eHealth strategic planning is responsive to changing health domain needs/priorities reflected in the health sector plan and the M&E plan. eHealth governing body is responsible for identifying misalignment and proposing corrective action.	
Leadership and Governance	I.C	Policy, Legal, and Regulatory Framework and Compliance	Do eHealth policies and legislation exist and are they enforced?	There are no policies or legal framework for eHealth.	There are some eHealth policies and laws however they are focus mostly on IT. Some processes to enforce compliance exist but there is no defined process to follow in the event of non compliance.	Some policies and regulations (for data management, data sharing and use, privacy and security, and business process continuity) that govern eHealth are implemented and are used in managing eHealth activities in selected settings. Limited processes for enforcing compliance exist. Sometimes noncompliance is addressed.	Comprehensive eHealth legislation, regulation, and policies are created by a clearly defined body constituted of people/organizations from a wide variety of backgrounds. Core eHealth policies and regulations are being used and monitored following established guidance nationally and/or regionally for managing eHealth activities. Structured processes exist to address non-compliance.	Explicit national policies addressing data standards and interoperability, privacy and security, information and communication technologies (ICT) infrastructure, data stewardship, and data use agreements are widely available, used, and integrated in strategic eHealth/health planning, and compliance is monitored by the designated government department/unit. Metrics on compliance and noncompliance are collected, recorded, and reported.	Policies and legislation and their related processes for enforcement are regularly enforced and actively reviewed and updated by a designated government authority, as necessary, to reflect changes within the health domain.	
Leadership and Governance	I.D	Confidentiality and Informed Consent	Are there established policies and procedures to ensure confidentiality and informed consent?	There are no policies for confidentiality and informed consent.	Drafts of some policies and procedures for confidentiality and informed consent exist.	Written policies and procedures for confidentiality and informed consent exist; however, they are not followed consistently across all levels of the healthcare system.	Written policies and procedures for confidentiality and informed consent exist and they are generally followed consistently across all levels of the healthcare system.	There are established procedures to evaluate existing policies and procedures for confidentiality and informed consent.	Evaluation findings are used to improve policies and procedures for confidentiality and informed consent.	
Leadership and Governance	I.E	eHealth leadership and governance organizational structures and functions	Is there a governing body for eHealth planning and coordination at the national level that guides major decisions aligned with the strategic plan and following documented processes?	There is no eHealth governing body.	There is an informal eHealth governing body but rarely meets and uses ad hoc processes to make decisions	There is an informal eHealth governing body that meets periodically using documented processes to make decisions	There is a formally established eHealth governing body that meets regularly to make decisions related to eHealth activities and investments	The eHealth governing body meets regularly to make decisions aligned with the strategic plan and uses documented processes to govern and monitor eHealth activities and investments	The formally established eHealth governing body uses evaluations to improve its documented processes and make sound decisions in line with the strategic plan	
Leadership and Governance	I.F	Informatics focal point at the Ministry of Health	Is there an organizational focal point for informatics (e.g., an informatics unit, a Chief Informatics Officer) with responsibility and authority to influence and align all departments, programs, and agencies within the MoH, including those related to the MoH's information vision, strategies and polices?	There is no informatics focal point at the MoH.	At least one individual champion advocates for cross-departmental informatics capabilities in the MoH and has made isolated, ad hoc efforts to organize them.	The MoH has made sustained sustained attempts at organizing or coordinating informatics capabilities across the departments, programs, and agencies within the MoH.	The MoH has a funded organizational focal point for informatics that is responsible for coordinating informatics capabilities across the departments, programs, and agencies within the MoH.	The organizational focal point evaluates how well it guides informatics projects toward MoH and eHealth strategic objectives.	The MoH uses evaluation findings to improve informatics capabilities within and outside the organizational focal point.	

Leadership and Governance	I.G	Financial management	Is there a financing plan that includes a resource mobilization plan?	There is no financing plan	eHealth financing and resource mobilization efforts are limited to specific projects	eHealth financing and resource mobilization focus on short-term projects rather than long-term priorities. The need for a designated eHealth budget is recognized.	Standard processes exist to assess and identify HIS and ICT projects that align with strategic priorities. There is a designated eHealth budget line in the healthcare budget. Novel resource mobilization strategies are used such as private-public partnerships. Spending is monitored but in an ad hoc way.	There is a multi-year eHealth financing strategy aligned with overall healthcare and eHealth strategic priorities, and sources are identified for sustained HIS and ICT activities. Project implementation is funded using various types of financing, such as capital financing, revenue, public-private partnerships, and grants. Expenditure reports are shared with the relevant team/unit. Financial audit processes are in place and regularly carried out to promote accountability in eHealth spending.	An established financial management system is owned, reviewed, tracked, and revised by the government. eHealth investments consider different healthcare priorities and goals and strategically invest in capabilities to support future initiatives. HIS budgeting and expenditure data are used to inform financial planning for sustainable funding for eHealth projects.
Skilled Workforce	II.A	Workforce Strategy	Is there a workforce strategy that describes needed informatics capabilities and/or positions and have plans for recruiting, hiring and/or developing existing staff to meet those needs?	There has been no attempt to develop an eHealth workforce strategy	Only initial and isolated ad hoc efforts to develop an eHealth workforce strategy have occurred	There is a sustained attempt to develop an eHealth workforce strategy	A complete eHealth workforce strategy exists	A complete eHealthworkforce strategy and a method to evaluate its implementation both exist are enforced by the MoH Human Resources department	The eHealthworkforce strategy implementation is regularly evaluation and the findings are used to improve our informatics workforce
Skilled Workforce	II.B	Workforce Capacity and Development	Do individuals using and managing HIS and ICT have the skills and compentencies required, access to continued professional development, and have appropriate job classifications in line with their skills and abilities and the national strategic plan?	There are no defined HIS and ICT competencies, job classifications are lacking, and there is no available training	Relevant healthcare workers and administrators have the skills needed to complete specific HIS and ICT tasks required to do their jobs	Some cadres have clearly defined job descriptions that include HIS or ICT competencies, have access to training, and are deployed according to national strategic plan	Job descriptions for cadres using and managing are well-defined and aligned with the strategic plan. Cadres are rationally deployed and have access to professional development opportunities	Cadre are evaluated for their capabilities and move along an established career path facilitated by the access to a national eHealth training program. Workforce needs are forecasted and fulfilled through an established planning process	Job descriptions and training programs are routinely evaluation and improved. Workforce planning processes are regularly assessed and revised in accordnace with the national eHealth strategy
Skilled Workforce	II.C	ICT Management Skills	Are there highly experienced or academically prepared ICT Managers in key roles at the MOH and/or program levels, with backgrounds and training commensurate to their responsibilities?	There are no academically prepared or highly experienced ICT staff	There is at least one academically prepared or highly experienced ICT Manager at a key agency/site	There are some academically prepared or highly experienced ICT Manager at a key agency/site	There are academically prepared or highly experienced ICT Managers in key roles at both the overall health department and at the programmatic levels	There is an evaluation of needs for academically prepared or highly experienced at both the health department and programmatic levels	Evaluation findings improve agency-wide and programmatic access to academically-prepared or highly experienced informaticians.
Effectively Used and Well-Designed Systems	III.A	ICT Infrastructure	Is there sufficient hardware, networking, connectivity, and ICT support infrastructure in place to ensure the operation and maintenance of eHealth, in line with industry standards?	ICT infrascture is inadequate	Basic support is provided for limited hardware and networking at the national level	National standards exist however support, hardware, and connectivity fall short of standards	Adequate capacity exists to maintain hardware and connectivity at multiple levels in accordance with national standards	The degree to which health institutions have sufficient hardware, networking, and connectivity to run HIS that are in use is evaluated using doucmented processes. Operational support for systems is recognized in the national health plan and regularly reviewed.	All health institutions have appropriate harrdware, netowrking and connectivity to meet their needs. An operations and maintenance services mechanism is continuously reviewed and adapted with evolving eHealth requirements and following industry-based standards.
Effectively Used and Well-Designed Systems	III.B	Project Management	Are there documented technical project management procedures to guide a standard software development process for requirements definition, system design, implementation, maintenance, and eventual retirement?	There are no project managememt procedures or standard software development process	Initial efforts taken to establish a standard project management structure and software development lifecycle process	Projects frequently use standard technical project management and software development lifecycle processes.	Standardized technical project management and software development lifecycle processes are required and the eHealth governing body is responsible for ensuring compliance	The eHealth governing body has established methods to evaluate compliance with standard technical project management and software development lifecycle processes	The eHealth governing body uses evaluation findings to continuously improve how technical project management and software development processes enable effective information management and use
Effectively Used and Well-Designed Systems	III.C	Standards and Interoperability	Do our information systems use nationally recognized vocabulary, messaging and transport standards?	None of the information systems in use adhere to nationally recognized standards	Isolated, ad hoc efforts have been made to use nationally recognized standards	Several information systems use nationally recognized standards	All information systems use nationally recognized standards but with no coordination across programs or sectors	The eHealth governing body measures and coordinates adoption of nationally recognized standards across eHealth ecosystem to facilitate the exchange of health data between information systems	The eHealth governing body uses metrics and evaluation findings to improve standards adoption and implementation across all systems between which electronic data transmission is the default method for exchanging health information.

Effectively Used and Well-Designed Systems	III.D	Data Exchange	Is there the capability to securely send, receive and process electronic health data and/or messages between programmatic systems and with external parties?	There is no capability to exchange data	Systems rarely exchange data and a high level of manual effort is required to exchange and process these data. There is an effort to improve the process.	It is possible to exchange data between systems but some manual effort is required to process these data. There is a process for new exchange partners to test data exchange.	Systems routinely exchange data and there is minimal manual effort required to exchange and process these data.	Any system that would like to exchange and process data is able to and the eHealth governing body measures the degree to which there is coordinatin across the eHealth ecosystem. Exchange standards are tracked, monitored, and reviewed through a standardized process.	The eHealth governing body uses evaluation findings to continuously improve automated data exchange mechanisms, information reuse, and programmatic efficiency. Electronic data transmission is the default method for moving data among systems, facilities, and information systems. Industry-based standards are followed.
Effectively Used and Well-Designed Systems	III.E	Shared Services	Do programs share relevant services across the MoH, such as an integrated provider registry, naster facility list, master person index, terminology management, integration engine, and other applicable services?	Programs do not share any services across the eHealth ecosystem	Programs are considering sharing services across the eHealth ecosystem	The eHealth governing body is in the process of implementing key shared services across the eHealth ecosystem	All programs are actively sharing services across the eHealth ecosystem	The eHeath governing body has an established a method to evaluate shared services and enforce the degree to which they are use across the eHealth ecosystem	The governing body is able to use evaluation findings to continually improve the quality and utility of shared services for all programs within the eHealth ecosystem
Effectively Used and Well-Designed Systems	III.F	Data Quality and Use	Are there policies and procedures in place for data management, data quality, and data use?	There are no procedures for data management, data quality, or data use	Attempts have been made to document procedures for data management, data quality, and data use	Data management, data quality, and data use procedures are documented but are not followed consistently	Data management, data quality, and data use documented procedures that are followed consistently and are regularly reviewed and updated	The eHealth governing body has established procedures to monitor and enforce compliance with data management, data quality, and data use procedures that are outlined in the national eHealth strategy	The eHealth governing body routinely evaluates and improves processes and procedures for data management, data quality assurance and data use

Public Health Informatics Institute. 2019. "Informatics Savvy Health Department Tool Kit." Accessible from https://www.phii.org/info-savvy/self-assessment-tools;

Total Score: **0**

COSTED ACTION PLAN, GROUPE 1

Costed Action Plan Groupe 1

Axe Strategique	Objectif Strategique	Objectif Specifique	Indicateur de Performance	Activites/Actions	Resultats attendus	Cible	Couverture Geographique	Horizon temporel de la activité	Point d'encrage organisationnel	Taches	Estimation de Cout de la Tache
Leadership and Governance	Elaborer la Stratégie de la Santé Numérique - Disposer d'ici 2021 d'un plan stratégique budgétisé, arrimé à la Stratégie Sectorielle de Santé 2016-2027, élaboré avec la participation des parties prenantes clés, validé par le gouvernement et assorti d'un Plan de Suivi-Evaluation.	Disposer d'ici 2020 d'un plan stratégique budgétisé de santé numérique	Plan stratégique disponible	Mettre en place un comité de pilotage d'élaboration du projet de plan stratégique	Acte admninistratif créant le comité disponible	oui	National	Déc 2019	MINSANTE		
Leadership and Governance				Recruter un expert international pour accompagner le processus de développement du plan stratégique	Contrat d'expertise disponible	oui	National	Déc 2019	MINSANTE		
Leadership and Governance				Elaborer, valider le projet de plan stratégique	Projet de plan stratégique élaboré et validé	OUI	National	Déc 2019	MINSANTE		
Leadership and Governance		Plan de Suivi-Evaluation de la mise en oeuvre de la stratégie de la Santé Numérique - Elaborer d'ici 2020 un Plan de Suivi – Evaluation de la mise en œuvre du Plan Stratégique de Santé Numérique.	Plan de suivi-évaluation disponible	Mettre en place un groupe de travail chargé de développer le plan de S/E	Groupe de travail mis en place	oui	National	Déc 2019	MINSANTE		
Leadership and Governance				Elaborer, valider le projet de plan de suivi-évaluation	Projet de plan de S/E élaboré et validé	oui	National	Déc 2019	MINSANTE		
Leadership and Governance		Plan de financement - Elaborer d'ici 2021 un Plan pluriannuel de financement aligné au Plan Stratégique de Santé Numérique .	Plan de financement pluriannuel disponible	Mettre en place un groupe de travail chargé de développer le plan de financement pluriannuel	Groupe de travail mis en place	oui	National	Déc 2021	MINSANTE		
Leadership and Governance				Elaborer, valider le projet de plan de financement pluriannuel	Projet de plan de financement pluriannuel élaboré et validé	oui	National	Déc 2021	MINSANTE		
Leadership and Governance		Mobilisation des ressources - Mobiliser d'ici 2024 au moins 50% des ressources du plan de financement de la Santé Numérique .	Pourcentage de ressources mobilisées	Identifier les potentiels donateurs et bailleurs de fonds nationaux et internationaux sur la santé numérique	Liste des potentiels donateurs et bailleurs de fonds identifiés avec leur domaine d'intervention à la santé numérique	50%	National	'Déc 2024	MINSANTE		
Leadership and Governance				Développer des projets (investment case) à proposer aux donateurs et bailleurs de fonds	Projets développés		National	'Déc 2024	MINSANTE		
Leadership and Governance				Intégrer les projets de santé numérique dans les plans des programmes spécifiques	Projets développés et intégrés		National	Déc 2024	MINSANTE		
Leadership and Governance	Développer le cadre politique, juridique, reglementaire et de conformité de la santé numérique - Disposer d'ici 2024 des politiques, des textes législatifs et règlementaires, élaborés par un organe multisectoriel incluant des organisations non gouvernementales et des représentants de la société civile dont la mise en œuvre est effective à l'échelon central et déconcentré.	Elaboration des politiques et législations sur le SIS - Adopter et disséminer d'ici 2024 des politiques relatives aux normes de codification, de l'interopérabilité, de la confidentialité, de la sécurité, de l'infrastructure des TIC, du stockage et du partage des données de santé y compris le cadre législatif et réglementaire de la santé numérique	Documents de politique, textes législatifs et réglementaires disponibles	Mettre en place un groupe de travail chargé d'élaborer les projets de cadre politique, législatifs et réglementaires	Groupe de travail mis en place	oui	National	Déc 2024	MINSANTE		
Leadership and Governance				Elaborer, valider les projets de cadre politique, legislatif et reglementaire	Projets de cadre de politique, legislatif et reglementaire élaboré et validé	oui	National	Déc 2024	MINSANTE		
Leadership and Governance		Définition des politiques de conformité - Définir d'ici 2024 les processus et les procédures pour assurer la conformité des interventions de santé numérique avec les normes, les politiques et le cadre législatif et réglementaire	processus et procédures disponibles	Mettre en place un groupe de travail chargé d'élaborer les procesus et les procedures	Groupe de travail mis en place	oui	National	Déc 2024	MINSANTE		
Leadership and Governance				Elaborer, valider les projets de processus et de procedures	Projets de processus et procedures élaborés et validés	oui	National	Déc 2024	MINSANTE		

Leadership and Governance	Mettre en place des structures de gouvernance et de pilotage de la santé numérique - Disposer d'ici 2021 d'organes fonctionnels pour la coordination des activités de la santé numérique, au niveau central et déconcentré.	Leadership et Coordination du SIS - Mettre en place d'ici 2021 un comité national pour la supervision et la coordination des activités de la santé numérique	comité national mis en place	Mettre en place un groupe de travail chargé d'élaborer le projet d'acte créant le comité national pour la supervision d la coordination de la santé numérique	Groupe de travail mis en place	oui	National	déc 2021	MINSANTE		
Leadership and Governance				projet d'acte créant le comité national pour la supervision et la coordination élaboré et validé	projet d'acte créant le comité national élaboré et validé	oui	National	dec 2021	MINSANTE		
Leadership and Governance		Point Focal TIC au Ministère de la Santé Publique - Mettre en place d'ici 2021 au sein du Ministère de la Santé Publique, un secrétariat technique responsable de la santé numérique	acte administratif portant création du secrétariat technique disponible	élaboration du projet d'acte	projet d'acte élaboré et validé	oui	National	déc 2021	MINSANTE		

THE 2020-2024 NATIONAL DIGITAL HEALTH STRATEGIC PLAN FOR CAMEROON

REPUBLIQUE DU CAMEROUN
Paix - Travail - Patrie
MINISTÈRE DE LA SANTÉ PUBLIQUE

REPUBLIC OF CAMEROON
Peace - Work - Fatherland
MINISTRY OF PUBLIC HEALTH

THE 2020 - 2024 NATIONAL DIGITAL HEALTH STRATEGIC PLAN

MOH

CDC

PEPFAR

I-TECH International Training & Education Center for Health

JOHNS HOPKINS CAMEROON PROGRAM

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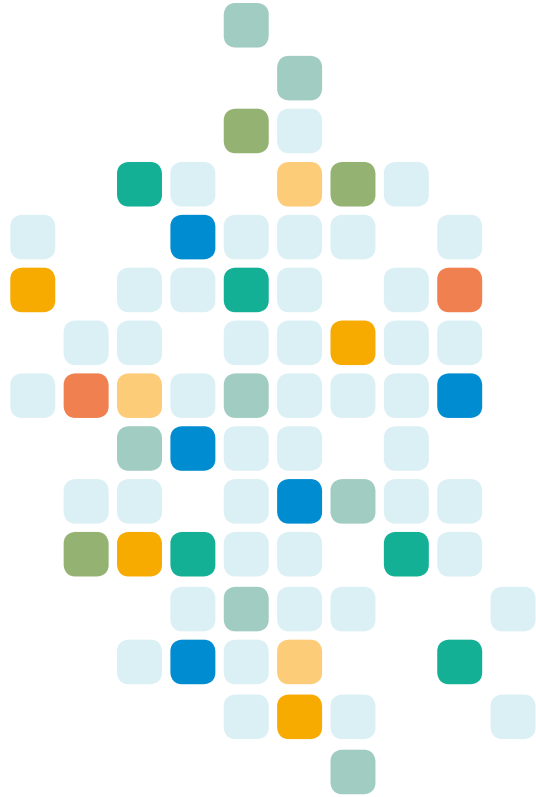

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PREFACE

By Dr. MANAOUDA MALACHIE

The World Health Assembly Resolution on eHealth, unanimously endorsed by World Health Organization (WHO) Member States in May 2018, which recognizes the value of digital technologies to help advance universal health coverage and other health objectives of the Sustainable Development Goals (SDGs), specifically tasked WHO to provide Member States with normative guidance in digital health on the most up-to-date evidence and advice to enable them to make the smartest investments and achieve the biggest gains in health.

In accordance with the WHO resolution, the Ministry of Public Health of Cameroon (MOH) and its development partners started the drafting process of the National eHealth Strategic Plan in June 2018. The actual drafting phase, which began in July 2019 under the auspices of the Health Information Unit and the IT Unit in collaboration with I-TECH/University of Washington in synergy with Johns Hopkins Cameroon Program (JHCP) and CDC-PEPFAR was preceded by a situation analysis carried out in 2018.
The drafting of the plan was a participatory process that involved public and private sector actors working in the field of health and information and communication technologies (ICTs) in Cameroon. The consensus reached after several workshops led to the definition of a common strategic vision for the development of eHealth for the next five years.

Technological developments continue to push the boundaries of disease management. Mobile Health (mHealth) can be used to collect surveillance data, monitor real-time patient health status, provide therapeutic assistance and health advice, monitor treatment adherence or carry out education and awareness campaigns in the field of health. Telemedicine provides opportunities for people living in areas where access to services is limited, to benefit from safe and quality care, through real-time interaction between the patient and the healthcare provider, through video conferencing and other forms of online and remote communication. All of this fit perfectly with the vision of transformation of the health system envisioned by President of the Republic S.E Paul BIYA.

Digital health will help:

- To meet the health needs of the population and improve living conditions through access to the best health care;

- To ensure patients make good decisions about their health status and enjoy effective, efficient and personalized health care;

- To promote Universal Health Coverage (UHC), which will contribute effectively to better patient care and surveillance of emerging diseases;

- To strengthen the urbanization of health information systems;

- To ensure a sustainable, secure, and efficient flow of data within the health information system;

- To ensure the standardized implementation of system tools and software;

- To improve the ICT infrastructure that is the bedrock of the health information system;

- To promote strong use of data for clinical service management, individual health decision making, and public health planning.

The main challenges facing our health system, such as geographic inaccessibility, low demand for services, delay in care delivery, poor adherence to clinical protocols, and costs borne by individuals, can be mitigated through the contribution of digital health interventions.

This National Strategic Plan now constitutes for all national and external stakeholders the unique reference framework for all interventions in the field of digital health, as a decisive contribution to achieving Universal Health Coverage in Cameroon. The Government is depending on the commitment of all for the effective implementation of this plan.

EXECUTIVE SUMMARY

Universal Health Coverage aims to ensure that all people have access to the preventive, curative, palliative, rehabilitation and health promotion services they need and that these services are of sufficient quality to be efficient, without the cost being a burden to its users.

The World Health Assembly Resolution on Digital Health, unanimously endorsed by Member States in May 2018, highlights the value of digital technologies, contributing to the advancement of universal health coverage. The resolution urges ministries of health to «evaluate their use of digital technologies for health, including health information systems at the national and subnational levels, to identify areas for improvement and prioritize the development, evaluation, utilization, scale-up and expansion of digital technologies, in order to promote equitable access, financially affordable and universal health for all, including the special needs of vulnerable groups in the context of digital health.» Digital technologies hold great potential for advancing sustainable development goals, particularly in support of health systems, improving the quality of health services and the accessibility of health services, both geographic and financial.

Two approaches have been used to describe the state of digital health in Cameroon: a desk study and an interactive exchange between key players in the health system during workshops organized for this purpose, including HIS specialists, high-level experts from the Ministry of Health (MOH), Ministry of Communication (MINCOM) and Ministry of Post and Telecommunications (MINPOSTEL).

An analysis of each component of digital health in Cameroon was conducted using the tool Stage of Continuous Improvement Tool Kit (SOCI), which helps to assess different levels of development. This situation analysis identified priorities for digital health, and defined a strategic framework with a new vision, goals, strategies and priority actions to operationalize digital health activities in Cameroon.

The vision is to ensure that by 2024, digital health contributes effectively to Universal Health Coverage (UHC), through informed decision-making at all levels of the health pyramid, through reliable, robust, secure and interoperable systems.

The budget for the National Strategic Plan of Digital Health amounts to 11,327,570,000 XAF ($19,037,933) over a period of five years, and is distributed among the following seven strategic areas:

AREA 1: Leadership and Governance:
277,600,000 XAF ($466,555)

AREA 2: Legislation, Policy and Compliance:
75,000,000 XAF ($126,050)

AREA 3: Human Resources:
233,000,000 XAF ($391,597)

AREA 4: Strategy and Investments:
1,000,000 XAF ($1681)

AREA 5: Infrastructure:
6,024,670,000 XAF ($10,125,496)

AREA 6: Standards and Interoperability:
480,900,000 XAF ($808,235)

AREA 7: Services and Applications:
4,235,400,000 XAF ($7,118,319)

ACRONYMS AND ABBREVIATIONS

ADX	Aggregate Data eXchange is a profile that supports interoperable public health reporting of aggregate health data. These most typically take the form of routine reports (weekly, monthly, quarterly etc.) from a health facility to some administrative jurisdiction such as a health district, though there are numerous other use cases such as international reporting and community health worker reporting.
ANTIC	National Agency for Information and Communication Technologies
ART	Telecommunications Regulatory Board
CAMTEL	Cameroon Telecommunications
CBCHS	Cameroon Baptist Convention Health Services
CDC	Centers for Disease Control and Prevention
CDE	Camerounaise des eaux (Cameroonian Water)
CHDC	Cameroon Health Data Collaborative
CI	IT Unit
CIU	Code Identifiant Unique du Patient (Unique Patient Identifier)
CPP/DEP	Planning and Programming Unit / Studies and Projects Division
CT3	Technical Adviser No. 3 at the MOH

DAJC	Division of Legal Affairs and Litigations
DCOOP	Cooperation Division
DLMEP	Department of Disease, Epidemic and Pandemic Control
DOSTS	Department of Care Organization and Health Technologies
DPML	Department of Pharmacy, Drugs and Laboratories
ENEO	Electrical Utility of Cameroon
FHIR	Fast Healthcare Interoperability Resource is a draft data standard developed and nurtured by HL7 International. FHIR addresses the complexity of healthcare data, and takes a modern, internet-based approach to connecting different discrete elements.
GIZ	German Society for International Cooperation
HIS	Health Information System
HIU	Health Information Unit
HL7	Health Language Seven is a messaging and interoperability oriented standard and organization of health data. It is the most common standard set for exchanging data between clinical systems.
HSS	Health Sector Strategy
IAI	African Institute of Computer Sciences
ICD	The International Classification of Diseases was developed and is managed by the World Health Organization.
I-TECH	The International Training and Education Center for Health

ITO	International Telecommunications Organization
JHCP	Johns Hopkins Cameroon Program
LOINC	Logical Observation Identifiers Names and Codes is a standard classification system used primarily for laboratory and clinical observations. It was developed by the Regenstrief Institute
MINAS	Ministry of Social Affairs
MINCOM	Ministry of Communication
MINEFI	Ministry of Economy and Finance
MINPOSTEL	Ministry of Post and Telecommunications
MINPROFF	Ministry for the Advancement of Women and Families
MOH	Ministry of Public Health
MTEF	Medium-Term Expenditure Framework
NACC	National AIDS Control Committee
NEHSP	National eHealth Strategic Plan
NPHO	National Public Health Observatory
PISE	Integrated Monitoring and Evaluation Plan
SIGIPES	Computerized system for the integrated management of state personnel and payroll

SNOMED	Systematized Nomenclature of Medicine is a comprehensive vocabulary that covers almost every aspect of clinical care - ranging from anatomy to diagnoses to observations and procedures.
SOP	Standard Operating Procedure
SWOT	Strengths, Weaknesses, Opportunities and Threats
UCSF	University of California – San Francisco
UHC	Universal Health Coverage
WHO	World Health Organization
PDRH	Universal Health Coverage
PSNSN	World Health Organization
PTA	Partenaires Techniques et Financières
SIGIPES	Système Informatique de Gestion Intégrée du Personnel de l'Etat et de la Solde
SIS	Système d'Information Sanitaire
SNOMED	Systematized Nomenclature of Medicine est un vocabulaire complet qui couvre presque tous les aspects des soins cliniques - de l'anatomie au diagnostic, en passant par les observations et les procédures.
SOP	Standard Operating Procedure (Procédure d'opération standard)
UCSF	University of California – San Francisco

DEFINITION OF KEY WORDS

Table 1: Definition of Key Words

CONTINUITY OF AN ACTIVITY	Implementation of planning, monitoring and evaluation systems to ensure continuity of care and operational services.
CONTINUOUS IMPROVEMENT	A gradual and decisive improvement of products, services or processes. These efforts may seek a "progressive" improvement over time or a "revolutionary" improvement in a short space of time.
CYBERHEALTH/E-HEALTH / DIGITAL HEALTH	See "Digital Health"
DIGITAL HEALTH	Use of information and communication technologies (ICTs) in support of health and related fields, including health services, health surveillance, health and education literature, knowledge and health research.
INFORMATION SYSTEM	Technical and human resources that ensure the storage, computer processing, distribution and communication of information required by all or part of the organizational unit (in this case, the health system).
INFORMATIVE TELEMEDICINE	Organizes the dissemination of medical knowledge and protocols for patient management and care in order to support and improve the medical activity.
MATURITY MODEL	The maturity model is used to measure the capacity of an organization or government entity, such as the Ministry of Public Health, to continuously improve in a specific discipline until it reaches the desired level of development or maturity
MEDICAL RESPONSE	Provided within the framework of medical regulation of emergencies or the continuity of care
MEDICAL TELEASSISTANCE	A medical doctor remotely assists another health professional in performing a medical act;
MEDICAL TELEMONITORING	A doctor remotely interprets the data necessary for the medical follow-up of a patient and, if necessary, makes the decisions relating to his management. The recording and transmission of data can be automated or performed by the patient himself, or a health professional.
TECHNOLOGY	The application of scientific knowledge for practical purposes, especially in industry. This includes machinery and equipment developed from the application of scientific knowledge.
TELECONSULTATION	A doctor consults a patient remotely. A health professional or psychologist may be present with the patient and, where appropriate, assists the doctor during this act.
TELEEXPERTISE	A doctor remotely seeks the opinion of one or more of his colleagues based on their training or specialty, for information related to the management of the patient.
TELEMEDICINE	Allows health professionals to remotely perform medical acts for patients.

INTRODUCTION

Universal Health Coverage aims to ensure that the population has access to the preventive, curative, palliative, rehabilitation and health promotion services they need and that these services are of satisfactory quality to be efficient, without the cost being a burden to users.

Health system challenges, such as geographical inaccessibility, low demand for services, delayed care delivery, poor adherence to clinical protocols and costs borne by individuals, contribute to an additional drop in health system performance, with a negative cumulative impact on the health of individuals.

These shortcomings limit the ability to fill gaps in coverage, quality and affordability, and undermine the potential for achieving Universal Health Coverage.

It is from this perspective that the World Health Assembly Resolution on Digital Health, unanimously endorsed by Member States in May 2018, highlights the collective recognition of the value of digital technologies in contributing to the progress of universal health coverage. The resolution urges ministries of health 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, utilization, scale-up and expansion of digital technologies, as a means of promoting equitable, affordable and universal access to health for all, including the special needs of vulnerable groups in the context of digital health."

Several emerging digital health interventions can help address the challenges of the health system at different levels, throughout the process leading to universal health coverage. Nevertheless, as is the case with the introduction of any innovation or new approach, digital health interventions require behavior changes and transitions to new practices. Success can only be guaranteed if the proposed technology is adopted by users, adds value and facilitates the desired change or action. Thus, persons charged with implementation need to be aware of the motivations, barriers and resistance to the disruption of the status quo, which can affect deployment fidelity, and understand that this will mitigate the potential benefits of digital health interventions.

This digital health strategy is based on interventions whose benefits, drawbacks, acceptability, feasibility, resource utilization and equity have been evaluated.

CHAPTER I : BACKGROUND

1.1. GEOGRAPHICAL, ADMINISTRATIVE AND POLITICAL SITUATION

Cameroon is a Central African country located on the Gulf of Guinea between latitudes 2° and 13° north and longitudes 9° and 16° east. It covers a surface area of 475,440 square km., extends approximately 1200 km. from north to south and over 800 km. from west to east. It shares boundaries with Nigeria to the west, Chad to the northeast, the Central African Republic to the east, and Congo, Gabon and Equatorial Guinea to the south. In the southwest, the country faces the Atlantic Ocean. The country is divided into ten regions, with Yaoundé as its political capital and Douala its economic capital.

Cameroon is a democratic state which practices political pluralism and individual and collective freedoms. It is a bilingual country, with English and French spoken by 30% and 70% of Cameroonians, respectively. Cameroon is a secular state where Christianity is practiced by 40% of the population, animism by 40%, and Islam by 20%. Its population is a mixture of more than 250 ethnic groups with different customs and traditions, whose socio-cultural weight influences patients' therapeutic route. It is divided into 10 Administrative Regions, 58 Divisions, 360 Sub-Divisions and 374 Regional and Local Authorities (councils and urban communities).

1.2. SOCIO-ECONOMIC CONTEXT

In Cameroon, the percentage of people living below the poverty line dropped from 40.2% in 2001 to 39.9% in 2007, reaching 37.5% in 2014. Poverty remains a common phenomenon in rural areas despite efforts made through public development policies. The rural poverty rate in 2014 was 56.8% compared to 55.7% in 2007.
Moreover, rural areas contain the bulk of the poor population (90.4%). Four regions have particularly high poverty rates: Far North (74.3%), North (67.9%), North West (55.3%) and Adamawa (47.1%). The other regions have rates below the national poverty rate: South (34.1%), Centre excluding Yaoundé (30.3%), East (30.0%), West (21.7%), Littoral excluding Douala (19.5%) and South West (18.2%). The two largest cities have the lowest rates: 5.4% in Yaoundé and 4.2% in Douala. Distributing the poor according to region, the Far North (35.8%), North (20.1%) and North-West (13.2%) accounted for about 70% of the poor population in Cameroon in 2014, given their demographic weight and high poverty rates.

With regard to access to basic infrastructure, households are located at an average distance of about 3.6 km from the nearest Electrical Utility of Cameroon (ENEO) electricity pole, and 1.6 km from the nearest connection point of the Camerounaise des eaux (CDE) water distribution network. Long distances (an average 6.9 km) are mainly observed in rural areas with regard to electricity. Generally, a household is located at an average distance of 7.6 km from the nearest civil status registration center, 6.8 km from the nearest district hospital or medicalized health center, 5.2 km from the nearest pharmacy or pro-pharmacy. This basic infrastructure is more accessible to urban households than to rural households.

1.3. DEMOGRAPHIC CONTEXT

The population of Cameroon is estimated at 25,492,353 inhabitants in 2019. There is a high concentration in the cities of Douala and Yaoundé. The North and West plateau have high population densities. With a life expectancy of 52 years, the population is composed of 43% young people under 15, and only 3.5% of people over 65 years.

1.4. INTRODUCTION OF THE CAMEROON HEALTH SYSTEM

At the institutional level, the health system is structured at three levels, namely: the central level, the intermediate level and the peripheral level. It also has three sub-sectors: a public sub-sector, a private sub-sector and a traditional sub-sector that are all under the responsibility of the Ministry of Public Health (MOH), in accordance with Decree No. 2013/093 of 3 April 2013 on the organization of this institution. According to this document, the MOH is responsible for the development and implementation of the Government's public health policy .

Basic care, such as malaria management, is provided in 4,432 health facilities, immunization in 3,818 health facilities and tuberculosis management in 256 health facilities.

Table 2: Distribution of the total population of Cameroon by region estimated over the period 2020 - 2024

Region	Total population in 2020	Total population in 2021	Total population in 2022	Total population in 2023	Total population in 2024
Adamawa	1,345,934	1,381,714	1,420,545	1,460,928	1,500,728
Centre	4,846,002	4,967,833	5,095,147	5,225,915	5,355,618
East	1,146,981	1,172,028	1,198,736	1,226,797	1,255,231
Far North	4,734,875	4,874,303	5,023,545	5,178,810	5,336,892
Littoral	3,987,222	4,085,142	4,188,368	4,291,250	4,393,388
North	2,964,768	3,074,326	3,173,916	3,276,891	3,380,994
North West	2,278,503	2,307,319	2,338,843	2,369,058	2,398,488
West	2,113,367	2,136,430	2,160,133	2,184,726	2,208,514
South	818,190	830,612	844,135	857,642	871,260
South West	1,897,193	1,935,815	1,975,769	2,016,828	2,057,390
CAMEROON	**26,133,035**	**26,765,522**	**27,419,137**	**28,088,845**	**28,758,503**

Table 3: Health facilities providing malaria management, tuberculosis management and vaccination services

REGION	Health facilities providing malaria management	Health facilities providing vaccination services	Health facilities providing tuberculosis management
Adamawa	167	166	9
Centre	1139	833	55
East	242	232	21
Far North	403	417	31
Littoral	679	529	39
North	258	258	21
North West	353	318	21
West	623	609	20
South	261	203	19
South West	307	253	20
TOTAL	**4,432**	**3,818**	**256**

The 2016-2027 Health Sector Strategy (HSS) sets the course for the main guidelines in the health domain, and is also a fundamental lever for advocacy and resource mobilization for the development of the health sector. It has 5 strategic objectives which are:

- ***Encourage the population to adopt healthy behaviors;***
- ***Reduce premature mortality caused by preventable diseases;***
- ***Reduce overall mortality and lethality in health facilities and in the community;***
- ***Improve the institutional capacity of health facilities for sustainable and equitable access of the population to quality health care and services;***
- ***Improve health system performance at all levels.***

CHAPTER II : METHODOLOGICAL NOTE

2.1. APPROACH

Since 2017, major actors in the Ministry of Public Health have deemed it necessary to develop a digital health strategic plan. With CDC funding, the MOH sent some key actors to the Intergovernmental Learning Exchange for Advanced Data Driven Decision Making - I-LEAD meetings held in Atlanta in June 2018. During these meetings, a maturity-based assessment model was created. This model served as a tool for describing the situation analysis of digital health in Cameroon. The methodological framework for this drafting process is provided by the MOH in partnership with WHO and the US CDC.

2.2. REFERENCE DOCUMENTS

The main reference documents used to describe the state of digital health are:
• The Cameroon HIS Evaluation Report presented by the University of Washington and the University of California -San Francisco in 2017;

• The mapping of information subsystems and investments in the NHIS in Cameroon presented by WHO;

• The self-assessment of computerized organizations presented at the Intergovernmental Learning Exchange sponsored by the CDC to advance data-driven decision-making (I-LEAD);

• The National eHealth Strategy Toolkit. This is the methodological reference used for the drafting of this document. The guide highlights the different steps that have marked the process of developing national cyberhealth plans;

• The Cameroon Strategic Planning Guide 2012 Edition.

2.3. METHODOLOGY USED IN DESCRIBING THE STATE OF DIGITAL HEALTH AND IDENTIFYING PROBLEMS

Two approaches were used in describing the state of digital health in Cameroon: Literature review and interactive exchanges with key actors in the health system during workshops organized for this purpose (HIS specialists, high-level experts from the MOH, MINCOM and MINPOSTEL).

2.4. DRAFTING PROCESS OF THIS STRATEGY

For the development of this document, stakeholders from different ministries and partners engaged in a participatory process comprising four successive steps which are:

• The development of an initial draft of the plan with the following sections: (i) a methodological note, (ii) situation analysis; (iii) a vision of digital health in Cameroon with its guiding principles; (iv) strategic areas and objectives; (v) a detailed and costed action plan including key performance indicators and a realistic timetable.

• The revision of the digital health strategic plan during a workshop to improve and fine-tune the initial work (technical validation). During this working session, several questions about the quality of the document and its implementation were discussed: do the strategic objectives align with the shortcomings identified in the situation analysis? Is the plan realistic in terms of timing and required resources? Does the plan promote appropriation of the implementation process by the government?

• Organization of a working session to finalize this work. This step will allow stakeholders to review the English and French versions of the document and submit them officially to the Minister of Public Health for adoption.

• The organization of an official adoption ceremony of the National eHealth Plan and the effective start of its dissemination and implementation.

CHAPTER III : SITUATION ANALYSIS OF DIGITAL HEALTH IN CAMEROON

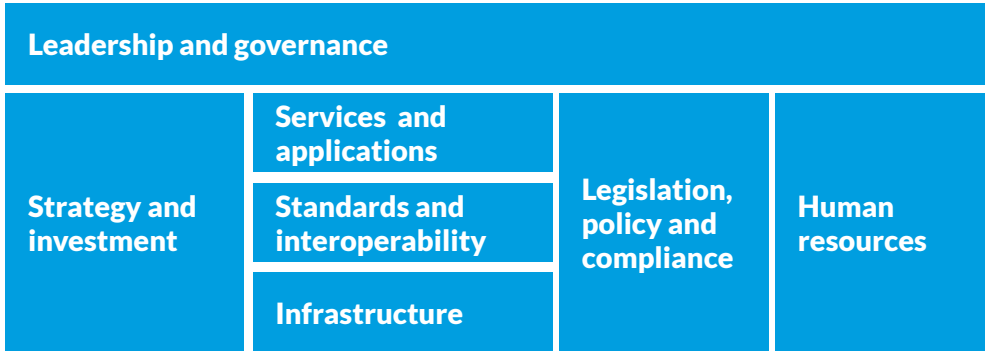
Digital technologies hold great potential for progress towards sustainable development goals, particularly to support health systems, by improving the quality and accessibility of health services in both geographic and financial terms.

In Cameroon in 2016, 6% of households had access to the internet and 4% had fixed broadband access at home (at least 2 Mbps).

With regard to the use of the internet by region, three groups of regions were observed: those with lower rates (the three northern and the North-West regions) with less than 10% of individuals having used the Internet, other regions (South-West, Yaoundé, Douala) with record proportions of 19%, 49% and 35% for the same figure, and finally, regions that recorded between 11% and 14% of individuals who had used the Internet. This is the case of the Center region except Yaoundé, the Littoral except Douala and the West.

One of the limitations in access to ICT is the cost; the average cost of Mbps per month was 23,000 FCFA on average in 2016. Under these conditions, the poor whose income is below the SMIG (36,270 XAF) cannot easily access e-Health services.

Figure 1: eHealth Components



The analysis of each component of digital health in Cameroon was conducted using the Stage of Continuous Improvement Tool Kit (SOCI) tool that facilitates the assessment of different levels of development (see Table 4) .

Each level of maturity, ranked 1 to 5, corresponds to a level of development of the component. Score 1 means no implementation (low maturity) while score 5 indicates optimal implementation of the component, which means that the country has unmistakable capacities for the implementation of digital health. In sum, this strategic plan is structured according to a maturity model, which allows stakeholders to consider the development of the digital health ecosystem as a process of continuous improvement and to define a common vision advocating optimization of the current system.

The purpose of using this maturity model is to identify the shortcomings of each component and then evaluate the efforts required for its optimization.

Table 4: Assessment of the maturity level of components

Level	Level description
Level 0: Absent	The component does not exist
Level 1: Emerging	Efforts are made in the component, but are occasional or isolated
Level 2: Development	The component exists, but ICTs used and compliance are inconsistent.
Level 3: Defined	The component exists and is used systematically at all levels of the health system.
Level 4: Institutionalized	The component exists and is supported by governance structures to monitor ICT usage and compliance.
Level 5: Optimized	Best practices are documented, the system frequently improves processes, data collected to monitor usage and compliance with the component are used, future challenges are anticipated and a plan put in place to address them.

3.1. LEADERSHIP AND GOVERNANCE

Within the Ministry of Public Health, there are three structures with clearly defined missions related to digital health in the organizational chart , with no real framework for coordinating interventions:

The Directorate of Healthcare Organization and Medical Technology leads:
- Applying government policy to the acquisition and maintenance of medical equipment;
- Specifying standard equipment for health facilities;
- Developing equipment maintenance and depreciation programs and monitoring their application;
- Technological oversight in health matters; the preparation of technical consultation documents for companies for the requisition of biomedical equipment;
- Ensuring compliance of equipment ordered;
- Improving technical platforms for health facilities (public and private)
- Maintaining medical equipment files

The IT Unit leads:
- Designing and implementing the ministry's IT master plan;
- Selecting IT equipment and operating systems;
- Setting up databanks and databases related to the various computer sub-systems of the Ministry;
- Ensuring the security, availability and integrity of the computer system;
- Benchmarking on Information Communication Technology
- Promoting information and communication technologies;
- Studying the development, operation and maintenance of the ministry's applications and computer network:
- Promoting e-government.

The Health Information Unit leads:
- Designing and monitoring the implementation of the health information system;
- Collecting and processing statistical health data, in collaboration with the National Public Health Observatory (NPHO);
- Establishing databanks and databases relating to public health;
- Developing national health indicators;
- Preparing the National Public Health Accounts, in collaboration with the NPHO;

- Updating the health map;
- Ensuring the security and availability of statistical data, in collaboration with the NPHO;
- Publishing health data, in collaboration with the NPHO.

These three entities do not yet possess the required tools and capacities to effectively implement digital health across multiple sectors or to fulfill the vision of a digital Cameroon by 2020 and the HSS 2016-2027. Several partners and donors support the development of health information systems that respond to the specific needs of different health programs. However, some of these programs have indicators that are not aligned with the 2016-2027 HSS. As a result, there are several information digitization systems that will neither be aligned with the 2020 National Digital Health Strategy nor the 2016-2020 Integrated Monitoring and Evaluation Plan (IMEP).

Nevertheless, the National Public Health Observatory (NPHO) and the Cameroon Health Data Collaborative are now working to bring together various partners for a collective contribution to the HIS development vision.

The country has a ministry in charge of telecommunications (MINPOSTEL) and structures under its supervision in charge of regulation (ART) and the national agency of ICTs (ANTIC). However, the collaborative link between the MINPOSTEL, incubator of the Cameroon Digital Strategy 2020, the MOH and ANTIC is neither structured nor regulated.

There are two structures related to digital health, whose missions are clearly defined in decree n ° 2013/093 of 03 April 2013 on the organization of the Ministry of Public Health, but without a real cooperative framework for intervention. These are the Computer Unit and the Health Information Unit.

3.2. LEGISLATION, POLICY AND COMPLIANCE

This component examines the normative framework, that is, the legal and regulatory provisions that govern digital health in Cameroon. While the implementation of the sector strategy cannot function without a digital component, it is important to point out that this digital use has privacy and/or individual freedoms risks, as there is no adequate law on digital health in Cameroon. However, the country has some legal and regulatory instruments that regulate ICT, including Decree No. 2012/180 of 10 April 2012 on the organization and functioning of the National Agency for Information and Communication Technologies (ANTIC) whose missions include:

- Regulate, control and monitor activities related to the security of information systems and electronic communication networks, as well as electronic certification, in collaboration with the Telecommunications Regulatory Agency (ART)

- Promote ICTs.

A draft instrument on telemedicine is being finalized at the MOH; generally, there are legal loopholes in the implementation of health interventions in Cameroon, including the absence of instruments guaranteeing confidentiality and the right to privacy.

There is a national ethics committee for research on human health, as well as review committees that promote medical and biomedical ethics in the country. However, Cameroon does not yet have a regulatory and ethical framework for the implementation of digital health interventions. The sharing of health data between sources has more benefits for the improvement of care, than risks of intrusion into the privacy of individuals.

It is therefore necessary to have regulatory tools validated by a multi-sector body to regulate all digital health practices in Cameroon.

3.3. HUMAN RESOURCES

Cameroon has several academic and professional institutions that train and graduate ICT technicians and engineers into the job market every year. However, a formal assessment and definition of skills and competencies required to support the growing digital health ecosystem should be conducted. Donors and specific partners offer capacity-building opportunities to meet their health data needs that may not always be in line with the vision of a Digital Cameroon by 2020.

Human resources for digital health include primarily health workers, IT professionals and developers of electronic content.

There are insufficient numbers of IT professionals responsible for managing and maintaining computer equipment and assisting health workers in using computer equipment and systems, especially in health facilities at the operational level.

However, it is worth noting that IT professionals are more plentiful at central and intermediate levels.

One of the main problems faced by health care institutions is their limited ability to attract and retain IT professionals and, more specifically, digital health professionals. Most health staff and users, especially those in rural areas, do not have computer skills. In addition, many doctors and nurses are primarily engaged in their technical work and feel that ICT is an additional burden that takes them away from their main tasks. In other health facilities, health workers are computer-literate, but the available computers are not used for routine technical tasks.

At the national level, MOH has local expertise in health information automation (DHIS2) and deployment of ICT infrastructure which ensures comprehensive visibility of the distribution of health districts across the country, performance assessment in promptness and completeness and finally, a reliable source of data to analyze the health situation in Cameroon based on the indicators of certain health programs (Malaria, HIV, AIDS et
c.).
However, there is no provisional management of digital health skills, nor a capacity-building plan in digital health developed by the MOH. Today, it is clear that the implementation of digital health in Cameroon at all levels of the health pyramid is facing a qualitative and quantitative shortage of competent and available human resources.

3.4. STRATEGY AND INVESTMENT

Cameroon has not yet developed an eHealth financing plan. Today, most of the funding obtained for eHealth is short-term. The government and Technical and Financial Partners, as well as some private sector actors, have invested in the procurement of ICT infrastructure and the training of healthcare providers as part of their support to the eHealth system. However, it is difficult today to assess high-level political commitment to adequate funding of eHealth in Cameroon. eHealth funds are dispersed among various ministries.

Moreover, in the absence of a body in charge of steering, coordinating, and monitoring the use of eHealth funds by the MOH and other ministries (MINCOM, MINEFI, MINAS, MINPROFF, MINPOSTEL, etc.), it will be difficult to assess the exhaustiveness of the funds mobilized and to rationally evaluate their long-term impact.

3.5. SERVICES AND APPLICATIONS

The DHIS2 provides a non-exhaustive list of the structures that make up the health pyramid. In the eHealth market in Cameroon, there are eHealth applications (CardioPad, GiftedMum, Dama, EMR) for the management of remote health interventions. But no provision, however embryonic, has yet been made for the establishment of an eHealth pyramid or a Cameroonian eHealth ecosystem integrating and organizing current initiatives. However, the government has prepared the Digital Cameroon 2020 development strategy that includes "digital health" as an important subcomponent for the development of the digital economy in Cameroon.

There is a National Public Health Observatory (NPHO) at the Ministry of Public Health in charge of disseminating health information, mainly collected at health facilities, and coordinating the Cameroon Health Data Collaborative (CHDC), which is a network of structures that produce and use health data. However, there is low use and harnessing of this data to improve the quality of decision-making at all levels of the health pyramid. Data collection tools and methods are not yet aligned with an effective standard reference model, but rather with specific, sometimes individual, approaches that do not always follow data search and cleanup frameworks. Despite this situation, NPHO in collaboration with the Department of Disease, Epidemics and Pandemics Control (DLMEP), carries out health oversight and monitoring, and conducts epidemiological and user satisfaction surveys in collaboration with the structures involved.

The MOH has a Division of Operational Research in Health (DROS) in charge of promoting operational research in health by disseminating research results through the Centre for Digital Documentation of the Health Sector (CDNSS), as well as the translation of these results into concrete proposals for action. As part of the CHDC, DROS and NPHO ensure the quality and use of health data produced. Collaboration between MOH, MINRESI and Universities for the promotion of Technological Innovation in the field of eHealth is still very insufficient.

3.6. INFRASTRUCTURE

Infrastructure refers to both physical technology and platforms or digital services that support information sharing within the health sector. The innovative approach in ICT takes into account the need for policy interventions in purchasing infrastructure as the key to successful implementation of eHealth systems. In this respect, the government has initiated infrastructural projects such as submarine optical fiber cables and their deployment in the main regions of the country. Thanks to public-private partnership, the government continues to promote the availability of and access to a reliable and affordable wireless broadband connectivity. These initiatives, coupled with the increasing penetration of mobile technologies, will provide the infrastructural impetus needed for the implementation of eHealth systems. Though the Ministry of Public Health has a national system for collecting aggregate health data (DHIS2) and some new applications (DAMA, EMR, eHealth, CardioPad etc.), it does not yet have a centralized and highly secured infrastructure that enables both synchronization of data and centralized oversight of all the entities of the health pyramid. Also, there is neither a proactive policy nor any strategies to establish an appropriate system for maintenance and depreciation of infrastructure.

In terms of health structures equipped with ICT at the national level, only 32.1% of health facilities have their own computers, while 16.8 % use private computers, with internet access limited to 27% of health facilities. Concerning information and communication, private mobile phones purchased by staff but used by the health facility are the most commonly used means of communication by health facilities (52.7%), followed by mobile phones belonging to the facility (33.2%), and private mobile phones with airtime paid for by the health facility (23.1%).

3.7. STANDARDS AND INTEROPERABILITY

For effective health data sharing, the software used must "speak the same language." Interoperability must be technical, specifying shared formats in order to enable the interconnection of different applications used in the health system. Without interoperability, there is no data sharing, and therefore no value-added services from this data.

Interoperability enables increased use of digital health data in an organized environment. To ensure secure health data-sharing, interoperability relies on the identification and authentication of those who access it. Today, this hard and soft infrastructure foundation is a "trusted environment" in line with public health objectives. It enables a generation of new services that are patient-oriented and based specifically on the use of structured data.

Interoperability is achieved by adhering to HL7, ADX, and FHIR Standard or Protocols to standardize data exchange between systems. The FHIR is an improved version of the HL7. It also includes clinical coding standards as well as medical terminology standards such as ICD, SNOMED, and LOINC. Its effectiveness lies in taking into account the Patient's Unique Identifier Code, the Patient's Index Number, a HF Master List, norms and standards, and finally, standard messages.

In Cameroon, the DHIS2 implemented by the Health Information Unit provides a non-exhaustive list of the structures making up the health pyramid, which is a prerequisite for the implementation of interoperability.

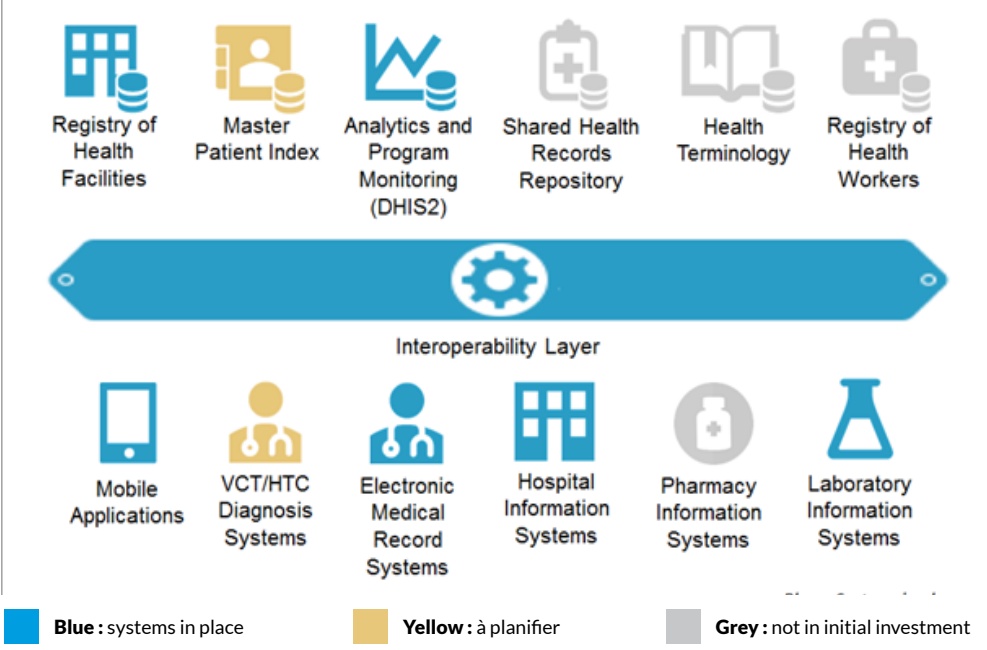
In Cameroon, health applications are developed according to a set of specifications that does not always take into account the existence of parallel solutions or operational integrity constraints (HL7) in relation to interoperability. The component-oriented development approach is still underused, and this leads to a proliferation of applications that often address the same issues and use the same data in the same health structures (SIH, DAMA, FUSCHIA, OpenMRS-Bahmni, etc.).

Therefore, the eHealth strategy should serve as a catalyst to produce guidelines on standards and interoperability to ensure their implementation and monitoring.

The DHIS2 implemented in Cameroon enables data sharing between the health districts and the central level. Data flow is mainly unidirectional, that is, from the base to the central level. This may cause control problems related to data quality and sources. It should be noted that MOH does not yet have an ICT infrastructure ensuring the interconnection of all the components of Cameroon's health pyramid. Although MINPOSTEL is the governing body responsible for issues related to data exchange, and given the existence of telecommunications operators (CAMTEL, Orange, MTN, Nexttel), there is no protocol or technical infrastructure like a data warehouse for health data sharing. The eHealth strategy could contribute to filling this gap.

All of these disparities and shortcomings, both technical and managerial, are not conducive to the development of eHealth in Cameroon.

Figure 2: Major Components of an Ecosystem of Interoperability



3.8. STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS

Strengths

- Political will in the Cameroon government to promote ICT, in order to improve the effectiveness and efficiency of healthcare provision and services.
- Collaboration between partners interested in evaluation and management of population health issues through ICTs (NGOs, donors, etc.)
- Several existing training facilities for health personnel (nursing and paramedical schools, Faculties of Medicine, Pharmacy, Dentistry and Biomedical Sciences, etc.)
- Several existing institutions and data-generating and consuming agencies of health information.
- Section in the e-Government master plan recognizing e-health as a priority area (e-health component of the Cameroon 2020 Digital Strategic Plan).
- Existing data collection systems for epidemiological surveillance in health facilities.
- Existence of a national health information system to collect individual patient data.
- Existence of a national health information system for aggregated data collection: District Health Information System (DHIS2).
- Availability of new mHealth applications: CARDIOPAD, Gifted Mom, DAMA.
- Availability of a national indicator protocol.

Weaknesses

- Lack of a unified vision and strategy for digital health among health sector actors.
- Absence of an MOH information system master plan and framework to monitor stakeholders' compliance with regulations.
- Low allocation of financial resources to strengthen the health information system.
- Poor coordination of the various actors producing health data.
- Absence of regulatory framework governing electronic medical records
- Insufficient public-private partnership for strengthening ICTs in the health sector.
- Absence of intra- and intersectoral management measures for health information sharing.
- Shortage of qualified staff in the field of medical informatics and biomedical engineering.
- Lack of continuing training of health personnel in ICT.
- Low integration of ICT modules in the continuing education of health personnel.
- Low allocation of resources for research and innovation in eHealth.
- Low capacity of electricity and internet supply in some remote health facilities.
- Insufficient patient data integration system.
- Absence of interoperability

- Existence of a national ethics committee for research and use of health data.

- Existence of a Cameroonian association of telemedicine and medical informatics

Opportunities

- Existence of training facilities for ICT experts (Schools for Computer and Telecommunications Engineers, etc.)

- Existence of a Cameroon association of telemedicine and medical informatics.

- Adoption of laws on electronic communications, cybersecurity and cybercrime.

- Development partners that support digital health programs and projects.

- Institutional support for the development of new technologies.

- Presence of young ICT innovators.

- Existing government and private initiatives to improve energy supply and green energy and internet coverage (4G) at affordable rates.

- Inter-ministerial collaboration (Ministries of Posts and Telecommunications, Higher Education, Scientific Research and Innovation etc.).

- Possibility to grant training scholarships to health personnel in the field of ICT.

- Wide range of IT and telecommunication specialties.

- Lack of existing system inventory (Digital Health Atlas).
- Non-exhaustive list of codified HFs
- A bsence of a complete clinical terminology of the health system.
- Absence of a unified patient record.
- Absence of the unique patient identifier code.
- Absence of an HIS oriented architecture
- Multiplicity of actors in HIS producing short-term data.
- Incomplete process for the harmonization of data collection tools

Threats

- Low implementation of national cybersecurity policy in the health information system.

- Budget and financial constraints limiting the government's ability to intervene in digital health.

- Possible resistance to changes in the implementation of eHealth applications.

- Cyberattacks .

- Weak institutional capacity for investigation and legal proceedings of cyberattacks.

- Corruption.

- Only 70% coverage of the national territory by 3G and 4G networks .

- Lack of ICT experts.

- Insufficient supply of electric power at the national level.

CHAPTER IV : CONCEPTUAL FRAMEWORK

This National eHealth Strategy aligns with the 2016-2027 Health Sector Strategy (HSS) and the Digital Cameroon 2020 vision in order to facilitate the achievement of their respective objectives for universal health coverage. The selected interventions are in line with WHO recommendations based on a critical assessment of factual data on emerging eHealth interventions, contributing to an improved health system and taking into consideration advantages, disadvantages, acceptability, feasibility, resource utilization and equity.

4.1. VISION

By 2024, Digital Health will effectively contribute to Universal Health Coverage (UHC) through informed decision-making at all levels of the health pyramid, and through reliable, robust, secure, and interoperable systems.

4.2. GUIDING PRINCIPLES

Table 5: Guiding Principles

Continuous improvement (maturity model)	It is necessary to develop eHealth in a continuous improvement process. This orientation makes it possible to set achievable goals.
Priority given to interventions with proven effectiveness	Selected interventions are based on a critical evaluation of the evidence, with consideration to the advantages, the disadvantages, the acceptability, the feasibility, the use of resources and equity
Patient-centered care	The patient is the ultimate beneficiary of digital health.
Data-based decisions	Evidence-based decisions ensure better patient care.
Transparency and accountability	eHealth governance protects beneficiaries and increases trust in electronic systems.
Quality assurance	Standards and procedures are important for quality assurance because nothing is more fragile than human lives affected by digital health.
Alignment of interventions by Technical and Financial Partners	The strategy provides a roadmap for Technical and Financial Partners to invest in the most important priorities for the country.

4.3. GENERAL OBJECTIVE

By 2024, improve the performance of the health system through optimal use of effective digital technologies at all levels of the health pyramid.

4.4. STRATEGIC ORIENTATION

Digital health has the potential to help address problems such as distance and access, but still shares many of the underlying challenges faced by health system interventions in general, including poor management, insufficient training, infrastructural limitations, and poor access to equipment and supplies. These considerations need to be addressed in addition to the specific implementation requirements introduced by digital health.

As with any introduction of innovations and new approaches, digital health interventions require changes in behavior and transitions to new practices. One example is moving away from entrenched paper-based systems to digital approaches. Implementations will succeed only if the digital health intervention is adopted by users, adds value, and facilitates the desired change or action. As such, implementers must be aware of the motivations, barriers and resistance to the disruption of the status quo that may affect fidelity of deployment, and understand that this will temper the possible benefits of digital health interventions.

The World Health Assembly Resolution on Digital Health unanimously approved by WHO Member States in May 2018, recognizing the value of digital technologies to contribute to advancing universal health coverage and other health aims of the Sustainable Development Goals (SDGs), **tasked the WHO to provide Member States with normative guidance in digital health on the most up-to-date evidence and advice to enable them to make the smartest investments and achieve the biggest gains in health.**

It is in this context that the WHO published **guidelines with recommendations based on a crtical evaluation of the factual data** on the emerging digital health interventions that are contributing to health system improvement, taking into account **benefits, drawbacks, acceptability, feasibility, resource use and equity.**

This document, which aims to strengthen evidence-based decision-making, encourages the integration and institutionalization of effective eHealth interventions:

1. Birth notification
2. Death notification
3. Stock notification and commodity management
4. Client-to-provider telemedicine
5. Provider-to-provider telemedicine
6. Targeted client communication
7. Patient/client health status tracking
8. Health worker decision support
9. Provision of training and educational content to health workers

These digital health interventions, available via mobile devices, are able to meet the challenges of the health system at different levels of coverage, throughout the process leading to Universal Health Coverage.

The strategic areas aim to create an ecosystem conducive to their implementation.

Table 6: Digital health interventions recommended by WHO based on evidence from impact assessments

DIGITAL HEALTH INTERVENTIONS	DEFINITION	SYNONYMES ET AUTRES DESCRIPTIONS
Provider to-provider Telemedicine	Provision of health services at a distance; delivery of health services where two or more health workers are separated by distance.	• Consultations for case management among health workers • Consulting with other health workers, • Particularly specialists, for patient case management and second opinion
Targeted client communication (targeted communication to individuals and patients)	i. Transmission of customized health information for different audience segments (often based on health status or demographic categories). Targeted client communication may include: ii. transmission of health event alerts to a specified population group; iii. transmission of health information based on health status or demographics; iv. alerts and reminders to clients v. transmission of diagnostic results (or of the availability of results)	• Notifications and reminders for appointments, medication adherence, or follow-up services • Notification of health events to specific populations based on demographic characteristics • Health education, behavior change communication, health promotion communication based on a known client's health status or clinical history • Alerts for preventive services and wellness
Health worker decision support	Digitized job aids that combine an individual's health information with the health worker's knowledge and clinical protocols to assist health workers in making diagnosis and treatment decisions.	• Clinical decision support systems • Job aid and assessment tools to support service delivery, may or may not be linked to a digital health record. • Algorithms to support service delivery according to care plans and protocol
Tracking patient/ client health status and services within a health record (digital tracking)	Digitized record used by health workers to capture and store health information on clients/patients in order to follow up their health status and services received. This may include digital service records, digital forms of paper-based registers for longitudinal health programs and case management logs within specific target populations, including migrant populations.	• Digital versions of paper-based registers for specific health domains • Digitized registers for longitudinal health programs, including tracking of migrant populations' benefits and health status • Case management logs within specific target populations, including migrant population.
Provision of educational content and training to health workers	The management and provision of education and training content in electronic format for health professionals. Unlike decision support, mLearning does not need to be used at the point of care.	

STRATEGIC AREA 1 : LEADERSHIP AND GOVERNANCE

STRATEGIC OBJECTIVE 1 : By 2024, improve governance and leadership in eHealth.

SPECIFIC OBJECTIVE 1.1: By 2021, establish a national committee to supervise and coordinate eHealth activities.

ACTIVITIES :
- Establish a working group to develop a draft instrument to create the National Committee for the Supervision and Coordination of eHealth.

- Organize workshops to validate the draft instruments.

SPECIFIC OBJECTIVE 1.2: By 2024, define processes and procedures to ensure compliance of eHealth interventions with standards, policies and the legislative and regulatory framework.

ACTIVITIES :
- Prepare the national digital health blueprint.
- Organize convention signing ceremonies.

SPECIFIC OBJECTIVE 1.3: By 2024, develop and disseminate the eHealth clinical safety policy document, including the legislative and regulatory framework for digital health.

ACTIVITIES :
- Develop the clinical safety policy document
- Disseminate the clinical safety policy document

SPECIFIC OBJECTIVE 1.4:
By 2024, have a strategic document for the management of availability, incidents, accessibility, service delivery and change.

ACTIVITIES :
- Develop a strategic document describing the management of availability, incidents, accessibility, service delivery and change.

- Disseminate the strategy document describing the management of availability, incidents, accessibility, service delivery and change.

SPECIFIC OBJECTIVE 1.5:
By 2020, develop a Monitoring/Evaluation Plan for the implementation of the eHealth Strategic Plan.

ACTIVITIES :
- Develop a Monitoring/Evaluation Plan for the implementation of the eHealth Strategic Plan.

- Disseminate the Monitoring/Evaluation Plan for the implementation of the eHealth Strategic Plan

STRATEGIC AREA 2: LEGISLATION, POLICY AND COMPLIANCE

STRATEGIC OBJECTIVE 2 : By 2024, strengthen the eHealth legal and regulatory framework.

SPECIFIC OBJECTIVE 2.1:
By 2024, improve policy and ethics in eHealth.

ACTIVITIES :
- Develop policy and ethics documents.
- Disseminate the policy and ethics documents.

SPECIFIC OBJECTIVE 2.2: By 2024, update and draft the instruments required to create an appropriate legal and institutional environment for partnership and contractual relations in eHealth.

ACTIVITIES:
- Develop legal instruments on digital health
- Disseminate legal instruments on digital health

STRATEGIC AREA 3: HUMAN RESOURCES

STRATEGIC OBJECTIVE 3:

By 2024, develop quantitative and qualitative human resources needed for digital health implementation.

SPECIFIC OBJECTIVE 3.1:
By 2020, assess the quantity and quality needs of health personnel who are to use the eHealth system.

ACTIVITY:
- Census of health personnel

SPECIFIC OBJECTIVE 3.2:
By 2022, have target personnel trained in the use of the computer tool.

ACTIVITIES:
- Provide first-level training to health personnel in IT
- Assess the level of the trained personnel
- Provide second-level training of health personnel in IT

SPECIFIC OBJECTIVE 3.3:
By 2024, have at least one ICT specialist in every district hospital.

ACTIVITY:
- Recruitment and capacity building of ICT specialists

SPECIFIC OBJECTIVE 3.4:
By 2022, have at least 10 eHealth application developers and 10 system administrators at the central level.

ACTIVITIES:
- Capacity building in eHealth applications development
- Capacity building in systems administration in digital health

STRATEGIC AREA 4: STRATEGY AND INVESTMENT

STRATEGIC OBJECTIVE 4

By 2024, strengthen investment and financing of eHealth

SPECIFIC OBJECTIVE 4.1:
Ensure the mobilization of national resources to finance the provision of eHealth services

ACTIVITIES:
- Develop an eHealth Annual Financing Plan (AFP)
- eHealth Financing Programming (Mobilizing matching funds)
- Budget eHealth financing

SPECIFIC OBJECTIVE 4.2:
Strengthen national and international partnership for eHealth.

ACTIVITIES:
- Organize advocacy meetings to mobilize financial resources for digital health
- Sign agreements (MOU) with private companies, CSOs, TFPs and partner administrations to mobilize funds for digital health.

SPECIFIC OBJECTIVE 4.3:
Establish a Digital Health Investment Fund

ACTIVITY:
- Establish a Digital Health Investment Fund

STRATEGIC AREA 5: SERVICES AND APPLICATIONS

STRATEGIC OBJECTIVE 5:

By 2024, develop services and applications that meet the needs of individuals, healthcare providers, managers and administrators of health facilities.

SPECIFIC OBJECTIVE 5.1:
By 2024, establish a UHC information management system in 50% of health facilities.

ACTIVITIES :
- Develop IT tools for medical, administrative and financial management of UHC.
- Deploy tools developed in the targeted structures.

SPECIFIC OBJECTIVE 5.2:
By 2024, set up a national integrated computer management system in 70% of health facilities.

ACTIVITIES :
- Develop an Electronic Medical Record.
- Develop tools for the logistics management of laboratories, finances, drugs, and vaccines.
- Longitudinal monitoring of patients of targeted program.
- Set up a public health event notification system.

SPECIFIC OBJECTIVE 5.3:
By 2024, develop telemedicine and mobile applications for the community, patients and service providers, and health care.

ACTIVITIES :
- Establish a telemedicine platform in Cameroon.
- Establish MOH communication mechanisms with target populations via mobile technologies.

STRATEGIC AREA 6: INFRASTRUCTURE

STRATEGIC OBJECTIVE 6:

By 2024, develop health information processing and sharing infrastructure between health structures and communities at the national and international levels.

SPECIFIC OBJECTIVE 6.1:
By 2022, ensure the availability of quality physical technological infrastructure in 70% of targeted health facilities.

ACTIVITIES:
- Strengthen broadband connectivity in targeted health facilities
- Increase IT equipment in targeted health structures
- Improve interconnection among targeted health structures
- Improve the maintenance of IT equipment and networks
- Establish alternative mechanisms to ensure the availability of electricity

SPECIFIC OBJECTIVE 6.2:
By 2023, ensure availability of cloud-based platforms or services in 70% of targeted health facilities.

ACTIVITY:
- Develop secure systems for health data storage

STRATEGIC AREA 7: STANDARDS AND INTEROPERABILITY

STRATEGIC OBJECTIVE 7:

By 2024, develop standards and interoperability components to improve the collection and exchange of consistent and accurate health information across geographical and sectoral boundaries.

SPECIFIC OBJECTIVE 7.1: By 2022, ensure the availability and application of ICT standards in 80% of health facilities at all levels of the health pyramid.

ACTIVITIES:
- Draft a standards framework.

SPECIFIC OBJECTIVE 7.2: By 2022, ensure the interoperability of IT systems in 80% of health facilities at all levels of the health pyramid.

ACTIVITIES:
- Ensure the secure exchange of data
- Set up a software accreditation /certification system
- Develop systems interoperability frameworks

It's all about highlighting

1 **Digital Health for Health System Strengthening and Universal Health Coverage**

2 **The main services offered are**

- Automation of birth declarations
- Automation of death notifications
- Stock notifications and product management
- Telemedicine
- Targeted patient communication
- Digital monitoring of patient health status and services
- Decision Support for Health Professionals
- Mobile learning for healthcare professionals ...

3 **This will be achieved through the implementation of the following flagship activities:**

- Defining the National Digital Health Architecture
- Establishment of a national digital health committee
- Implementation of the regulatory and legislative framework
- Digital training for health professionals
- Setting up a digital health investment fund
- Telemedicine for patients and the community
- Integrated electronic hospital management system
- Interconnection and equipment provision for 3,000 health facilities
- Definition of the interoperability framework and process software accreditation ...

CHAPTER V : INTERVENTION FRAMEWORK AND BUDGET

The National eHealth Strategic Plan (NEHSP) introduces a national framework for the development of digital health services over the next five years (2020-2024) to improve health promotion, disease prevention, case management, health system strengthening and governance, and strategic management of the health system. This Plan proposes specific activities in seven strategic areas to strengthen digital health in the country:

- **Leadership and governance**
- **Legislation, policy and compliance**
- **Human resources**
- **Strategy and investments in digital health**
- **eHealth services and applications**
- **Infrastructure**
- **Standards and interoperability**

The paragraph below describes the methodology used for NEHSP costing and a summary of the results of the cost estimate.

The costing covers a period of five years, from 2020 to 2024.

5.1. COSTING METHODOLOGY

An activity-based costing approach was used to estimate the funding required to implement the National eHealth Strategic Plan (NEHSP). On the basis of the general objective and the specific objectives, different activities were outlined. For each activity, cost elements were allocated in collaboration with stakeholders. All costs were calculated to obtain the total cost of the activity. Costs were presented in CFA Franc of Central Africa (XAF).

5.2. UNIT COSTS AND ASSUMPTIONS

Unit costs were obtained from various sources, including the use of documents and quotes from MOH, implementing partners, and quotes from IT and telecommunications suppliers. Cost estimates in dollars (US$) were converted to XAF at an exchange rate of XAF 595 per US dollar based on the average daily exchange rate (BEAC).

5.3. COST OF IMPLEMENTATION OF THE NATIONAL DIGITAL HEALTH STRATEGY

The NEHSP 2020-2024 is intended to address key challenges facing our health system, such as geographic inaccessibility, low demand for services, delayed delivery of care, poor adherence to clinical protocols, and costs incurred by individuals. To achieve this goal, an amount of 11,327,570,000 FCFA is required over the next five years, i.e. US $19,037,933. The table below summarizes the estimated costs for achieving the seven strategic objectives set out in NEHSP 2020-2024.

Table 7: Five-Year Budget for Implementation of the National eHealth Strategic Plan

	ANNUAL COST						
Strategic Objective	**2020**	**2021**	**2022**	**2023**	**2024**	**Total (XAF)**	**Total (USD)**
1. By 2024, improve governance and leadership in digital health.	135,500,000	62,900,000	28,400,000	28,400,000	22,400,000	**277,600,000**	**$466,555**
2. By 2024, strengthen the legal and regulatory framework for digital health.	3000,000	36,000,000	13,000,000	13,000,000	10,000,000	**75,000,000**	**$126,050**
3. By 2024, develop the quantity and quality of human resources needed to implement digital health.	46,000,000	113,000,000	11,000,000	55,000,000	8,000,000	**233,000,000**	**$391,597**
4. By 2024, strengthen investment and funding for digital health.	200,000	200,000	200,000	200,000	200,000	**1,000,000**	**$1,681**
5. By 2024, develop services and applications to meet the needs of individuals, healthcare providers, managers and administrators of health structures.	610,025,000	1,322,762,500	1,065,862,500	622,800,000	613,950,000	**4,235,400,000**	**$7,118,319**
6. By 2024, develop health information processing and sharing infrastructures between health structures and communities at national and international levels.	1,686,750,000	2,000,680,000	1,738,280,000	384,180,000	214,780,000	**6,024,670,000**	**$10,125,496**
7. By 2024, develop standards and interoperability components to improve the collection and exchange of consistent and accurate health information across geographical and sectoral boundaries.	197,800,000	175,600,000	40,833,333	48,833,333	17,833,333	**480,900,000**	**$808,235**
TOTAL	**2,679,275,000**	**3,711,142,500**	**2,897,575,833**	**1,152,413,333**	**887,163,333**	**11,327,570,000**	**$19,037,933**

Table 8: Budgeted Action Plan for Governance and Leadership Component (SO1)

1. By 2024, improve governance and leadership in digital health

	ANNUAL COST					
Strategic Objective	**2020**	**2021**	**2022**	**2023**	**2024**	**Total (CFA)**
1.1 By 2021, establish a national committee for oversight and coordination of digital health activities	7,500,000	-	-	-	-	**17,500,000**
1.2 By 2024, define processes and procedures to ensure compliance of digital health interventions with standards, policies and the legislative and regulatory framework	52,400,000	6,400,000	6,400,000	6,400,000	6,400,000	**78,000,000**
1.3 By 2024, develop and disseminate the clinical safety policy document for digital health, including the legislative and regulatory framework for digital health (Promoting clinical safety in digital health)	-	38,500,000	22,000,000	22,000,000	16,000,000	**98,500,000**
1.4 By 2024, have a strategic document on Availability, Incident Management, Accessibility, Service Delivery and Change Management	-	18,000,000	-	-	-	**18,000,000**
1.5 By the end of 2020, develop a Monitoring Plan - Evaluation of the implementation of the Strategic Digital Health Plan	65,600,000	-	-	-	-	**65,600,000**
TOTAL	**135,500,000**	**62,900,000**	**28,400,000**	**28,400,000**	**22,400,000**	**277,600,000**

Table 9: Budgeted Action Plan for the Legislation, Policies and Compliance Component (SO2)

2. By 2024, strengthen the eHealth legal and regulatory framework

	ANNUAL COST					
Strategic Objective	**2020**	**2021**	**2022**	**2023**	**2024**	**Total (CFA)**
By 2024, update and draft the instruments required to create an appropriate legal and institutional environment for partnership and contractual relations in eHealth.	3,000,000	36,000,000	13,000,000	13,000,000	10,000,000	**75,000,000**
TOTAL	**3 000 000**	**36 000 000**	**13 000 000**	**13 000 000**	**10 000 000**	**75 000 000**

Table 10: Budgeted Action Plan for the Human Resources Component (SO3)

3. By 2024, develop the quantity and quality of human resources needed to implement digital health.

	ANNUAL COST					
Strategic Objective	**2020**	**2021**	**2022**	**2023**	**2024**	**Total (CFA)**
3.1 Evaluate the quantity and quality needs for health personnel to use the digital health system by 2020	26 000 000	-	-	-	-	**26 000 000**
3.2 Have target personnel trained to use the computer tool by 2022.	6 000 000	75 000 000	-	43 000 000	-	**124 000 000**
3.3 Have at least one ICT expert in every District Hospital (4th Category) by 2023	-	-	3 000 000	4 000 000	-	**7 000 000**
3.4 Have at least 10 application developers in the digital health field at the central level by 2023.	7 000 000	34 000 000	4 000 000	4 000 000	4 000 000	**53 000 000**
3.4 Have at least 10 system administrators at the central level by 2023.	7 000 000	4 000 000	4 000 000	4 000 000	4 000 000	**23 000 000**
TOTAL	**46 000 000**	**113 000 000**	**11 000 000**	**55 000 000**	**8 000 000**	**233 000 000**

Table 11: Budgeted Action Plan for the Strategy and Investments Component (SO4)

4. By 2024, strengthen investment and funding for digital health

	ANNUAL COST					
Specific Objective	**2020**	**2021**	**2022**	**2023**	**2024**	**Total (CFA)**
4.1 Ensure mobilization of national resources for financing the provision of digital health services	-	-	-	-	-	**-**
4.2 Strengthen the national and international partnership for digital health	200 000	200 000	200 000	200 000	200 000	**1 000 000**
4.3 Establish a Digital Health Investment Fund	-	-	-	-	-	**-**
TOTAL	**200 000**	**200 000**	**200 000**	**200 000**	**200 000**	**1 000 000**

Table 12: Budgeted Action Plan for the Services and Applications Component (SO5)

5. By 2024, develop services and applications to meet the needs of individuals, healthcare providers, managers and administrators of health structures

	ANNUAL COST					
Specific Objectives	**2020**	**2021**	**2022**	**2023**	**2024**	**Total (CFA)**
5.1 By 2024, establish a UHC computer management system in 50% of health facilities	38 100 000	229 600 000	29 600 000	29 600 000	29 600 000	**356 500 000**
5.2 By 2024, establish an integrated national computer management system in 70% of health facilities	533 825 000	1 001 912 500	939 137 500	560 637 500	580 887 500	**3 616 400 000**
5.3 By 2024, develop telemedicine and mobile applications for the benefit of the community, patients and service providers, and healthcare	38 100 000	91 250 000	97 125 000	32 562 500	3 462 500	**262 500 000**
TOTAL	**610 025 000**	**1 322 762 500**	**1 065 862 500**	**622 800 000**	**613 950 000**	**4 235 400 000**

Table 13: Budgeted Action Plan of the Infrastructure Component (SO6)

6. By 2024, develop health information processing and sharing infrastructures between health structures and communities at national and international levels

	ANNUAL COST					
Specific Objective	**2020**	**2021**	**2022**	**2023**	**2024**	**Total (CFA)**
6.1 By 2022, ensure the availability of quality physical technology infrastructure in 70% of targeted health facilities	1 616 700 000	1 985 680 000	1 723 280 000	384 180 000	214 780 000	**5 924 620 000**
6.2 By 2023, ensure availability of cloud-based platforms or services in 70% of targeted health facilities	70 050 000	15 000 000	15 000 000	0	0	**100 050 000**
TOTAL	**1 686 750 000**	**2 000 680 000**	**1 738 280 000**	**384 180 000**	**214 780 000**	**6 024 670 000**

Table 14: Budgeted Action Plan for the Standards and Interoperability Component (SO7)

7. By 2024, develop standards and interoperability components to improve the collection and exchange of consistent and accurate health information across geographical and sectoral boundaries.

	ANNUAL COST					
Specific Objective	**2020**	**2021**	**2022**	**2023**	**2024**	**Total (CFA)**
7.1 By 2022, ensure the availability and application of ICT standards in 80% of health facilities at all levels of the health pyramid	116 000 000	-	-	-	-	**116 000 000**
7.2 By 2022, Ensure the interoperability of information systems in 80% of health facilities and at all levels of the health pyramid	81 800 000	175 600 000	40 833 333	48 833 333	17 833 333	**364 900 000**
TOTAL	**197 800 000**	**175 600 000**	**40 833 333**	**48 833 333**	**17 833 333**	**480 900 000**

CHAPTER VI :
MONITORING AND EVALUATION FRAMEWORK

Table 15: Performance indicators and targets by strategic objective

Strategic Area	Specific objectives	Indicators	Baseline values			Targets					Source	Methodology	Structure in charge
			Value	Source	Year	2020	2021	2022	2023	2024			
1. Leadership and Governance	By 2024, improve governance and leadership in eHealth	Achievement rate of the objectives of the eHealth strategic plan	ND	ND	2019	30%	50%	70%	80%	100%	Annual report	NOR/NOT	MOH
2. Legislation, Policy and Compliance	By 2024, strengthen the eHealth legal and regulatory framework.	Proportion of draft policies and legal instruments on digital health developed and validated	ND	ND	2019	30%	30%	20%	10%	10%	Workshop report	Estimation	MOH
3. Human Resources	By 2024, develop quantitative and qualitative human resources needed for digital health implementation.	Proportion of human resources trained in digital health	ND	ND	2019	40%	60%	100%	100%	100%	Annual report	Survey	IT Unit/DRH
4. Strategy and Investments	By 2024, increase digital health investment and financing	Proportion of the NeHP budget mobilized	0	ND	2019	15%	15%	30%	20%	20%	Annual report	Mobilized Budget / Total Budget	MOH
5. Services and Applications	By 2024, develop services and applications that meet the needs of individuals, healthcare providers, managers and administrators of health facilities	Proportion of health facilities using digital health services and applications	ND	ND	2019	0%	10%	20%	30%	50%	Report	Survey	IT Unit
6. Infrastructure	By 2024, develop the health information processing and sharing infrastructure between health structures and communities at the national and international levels	Proportion of health facilities equipped with digital health infrastructure	NA	NA	NA	0%	50%	70%	80%	100%	Report	Survey	IT Unit
7. Standards and Interoperability	By 2024, develop standards and interoperability components to improve the collection and exchange of consistent and accurate health information across geographical and sectoral boundaries	Proportion of targeted health facilities having accredited interoperable systems	ND	ND	ND	0%	50%	80%	90%	100%	Report	Survey	IT Unit

Table 16: Indicators and Targets by Specific Objective

STRATEGIC OBJECTIVE 1: BY 2024, IMPROVE GOVERNANCE AND LEADERSHIP IN DIGITAL HEALTH

Specific objectives	Indicators	Baseline values			Targets					Source	Method	Structure in charge
		Value	Source	Year	2020	2021	2022	2023	2024			
1.1 By 2021, set up a national committee to supervise and coordinate digital health activities	Number of committees set up	0	ND	2019	1	0	0	0	0	Decree to establish the committee	MONITORING	MOH
1.2 By 2024, define processes and procedures to ensure compliance of eHealth interventions with standards, policies and the legislative and regulatory framework	Number of procedures manuals validated	0%	ND	2019	800	800	800	800	800	Annual report	MONITORING	MOH
	Number of conventions signed	0%	ND	2019						Annual report	MONITORING	MOH
1.3 By 2024, develop and disseminate the eHealth clinical safety policy document, including the legislative and regulatory framework for digital health	Clinical security policy document validated and available	4000	ND	2019		1000	1000	1000	1000	Annual report	MONITORING	MOH
1.4 By 2024, have a strategic document for the management of availability, incidents, accessibility, service delivery and change management	Strategic document for the management of availability, incidents, accessibility, service delivery and change management available	0	ND	2019	0	1	0	0	0	Annual report	MONITORING	MOH
1.5 By 2020, develop a Monitoring/Evaluation Plan for the implementation of the eHealth Strategic Plan	Monitoring/Evaluation Plan for the implementation of the eHealth Strategic Plan available	0	ND	2019	200	0	0	0	0	Annual report	MONITORING	MOH

STRATEGIC OBJECTIVE 2: BY 2024, STRENGTHEN THE EHEALTH LEGAL AND REGULATORY FRAMEWORK

Specific objectives	Indicators	Baseline values			Targets					Source	Method	Structure in charge
		Value	Source	Year	2020	2021	2022	2023	2024			
2.1 By 2024, improve policy and ethics in eHealth	Policy and Ethics documents validated and available	ND	ND	2019	1	0	0	0	0	Annual report	Evaluation	MOH
2.2 By 2024, update and draft instruments required to create an appropriate legal and institutional environment for partnership and contractual relations in eHealth	Number of instruments signed	0%	ND	2019	5	5	5	5	5	Official gazette and Compendium	Evaluation	MOH

STRATEGIC OBJECTIVE 3: BY 2024, DEVELOP QUANTITATIVE AND QUALITATIVE HUMAN RESOURCES NEEDED FOR THE IMPLEMENTATION OF DIGITAL HEALTH

Specific objectives	Indicators	Baseline values			Targets					Source	Method	Structure in charge
		Value	Source	Year	2020	2021	2022	2023	2024			
3.1 By 2020, assess the quantity and quality needs of health personnel who will use the eHealth system	Document on needs assessment available	0	ND	2019	100%	0	0	0	0	Annual report	Census	MOH
3.2 By 2022, have target personnel trained in using the computer tool	Proportion of target staff effectively trained in IT by 2021	0	Census report 2020	2019	0	100%	0	0	0	Annual report	Evaluation	MOH
	Record available of all target staff effectively trained to use the digital health system by 2022	0	Evaluation report 2021	2019	0	0	100%	0	0	Annual report	Evaluation	MOH
3.3 Have at least one ICT specialist in every district hospital	Proportion of DHs which have at least one ICT expert	0	ND	2019	0		50%	100%	0	Annual report	Evaluation	MOH
3.4 Have at least 10 system administrators at the central level	Proportion of digital health application developers trained at the central level	0	ND	2019	0	0	50%	100%	0	Annual report	Evaluation	MOH

STRATEGIC OBJECTIVE 4: BY 2024, STRENGTHEN INVESTMENT AND FINANCING OF EHEALTH

Specific objectives	Indicators	Baseline values			Targets					Source	Method	Structure in charge
		Value	Source	Year	2020	2021	2022	2023	2024			
4.1 Ensure mobilization of national resources to finance the provision of eHealth services	Proportion of the national budget allocated to digital health	0	ND	2019	0%	5%	5%	5%	5%	Annual performance report / Annual monitoring report on convention implementation	State budget mobilized/ total budget	MOH
4.2 Strengthen national and international partnership for eHealth	Proportion of the NeHP funded by partners	0	ND	2019	15%	10%	25%	15%	15%	Annual performance report / Annual monitoring report on convention implementation	Partners budget / total budget	MOH
4.3 Establish a Digital Health Investment Fund	Number of eHealth investment funds in place	0	ND	2019	1					Annual performance report / Annual monitoring report on convention implementation		PR

STRATEGIC OBJECTIVE 5: DEVELOP SERVICES AND APPLICATIONS THAT MEET THE NEEDS OF INDIVIDUALS, HEALTHCARE PROVIDERS, MANAGERS AND ADMINISTRATORS OF HEALTH FACILITIES.

Specific objectives	Indicators	Baseline values			Targets					Source	Method	Structure in charge
		Value	Source	Year	2020	2021	2022	2023	2024			
5.1 By 2024, establish a UHC information management system in 50% of health facilities	Proportion of target health facilities with a UHC information management system	0	ND	2019	0%	5%	5%	5%	5%	Report	Survey	IT Unit
5.2 By 2024, set up a nationally integrated computer management system in 70% of health facilities	Proportion of targeted health facilities that have set up an integrated computer management system	NA	NA	NA	0%	10%	30%	15%	15%	Report	Survey	IT Unit
5.3 By 2024, develop telemedicine and mobile applications for the community, patients and service providers, and health care	Proportion of health facilities having developed telemedicine and mobile applications for patients	NA	NA	NA	0%	10%	30%	50%	70%	Report	Survey	IT Unit

STRATEGIC OBJECTIVE 6: BY 2024, DEVELOP HEALTH INFORMATION PROCESSING AND SHARING INFRASTRUCTURE BETWEEN HEALTH STRUCTURES AND COMMUNITIES AT THE NATIONAL AND INTERNATIONAL LEVELS.

Specific objectives	Indicators	Baseline values			Targets					Source	Method	Structure in charge
		Value	Source	Year	2020	2021	2022	2023	2024			
6.1 By 2022, ensure the availability of quality physical technological infrastructure in 70% of targeted health facilities.	Proportion of health facilities having good physical and technological infrastructure	NA	NA	NA	0%	50%	70%	80%	100%	Report	Survey	IT Unit
6.2 By 2023, ensure the availability of platforms or digital services in 70% of targeted health facilities	Proportion of targeted health facilities having a backup system for health data	NA	NA	NA	0%	20%	50%	70%	80%	Report	Survey	IT Unit

STRATEGIC OBJECTIVE 7: DEVELOP STANDARDS AND INTEROPERABILITY COMPONENTS TO IMPROVE THE COLLECTION AND EXCHANGE OF CONSISTENT AND ACCURATE HEALTH INFORMATION ACROSS GEOGRAPHICAL AND SECTORAL BOUNDARIES

Specific objectives	Indicators	Baseline values			Targets					Source	Method	Structure in charge
		Value	Source	Year	2020	2021	2022	2023	2024			
7.1 By 2022, ensure the availability and application of ICT standards in 80% of health facilities at all levels of the health pyramid.	Proportion of targeted health facilities enforcing the adopted standards	NA	NA	NA	0%	50%	80%	90%	100%	Report	Survey	IT Unit
7.2 By 2022, ensure the interoperability of IT systems in 80% of health facilities at all levels of the health pyramid	Proportion of targeted health facilities having accredited interoperable systems	NA	NA	NA	0%	50%	80%	90%	100%	Report	Survey	IT Unit

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REFERENCES

1. Four Basics to Know about the Role of FHIR in Interoperability. 22 March 2016. Health Analytics. Accessible from https://healthitanalytics.com/news/4-basics-to-know-about-the-role-of-fhir-in-interoperability

2. Assemblée mondiale de la Santé (AMS). 2018. "Santé numérique." http://apps.who.int/gb/ebwha/pdf_files/WHA71/A71_R7-fr.pdf

3. Cameroon HIS Landscape Assessment and Recommendations Report. October 2017. U.S. Centers for Disease Control and Prevention, Cameroon.

4. Central Intelligence Agency World Factbook: Cameroon. 2019. Accessible from https://www.cia.gov/library/publications/the-world-factbook/geos/cm.html

5. Flowers, J, L Buback, and P Hazelton. 2018 February. Cameroon HIS Landscape Assessment and Recommendations Report. Prepared for the US Centers for Disease Control and Prevention.

6. Gagneux, Michel. 2016. "Santé numérique : l'interopérabilité au service des usages de demain." I2D – Information, données & documents 2016/3 (Volume 53), pages 46-47. Accessible from https://www.cairn.info/revue-i2-information-donnees-et-documents-2016-3-page-46.htm#

7. IFORD: Survey on Health Services Delivery Indicators – Health Facility Assessment (SDI/HFA). 2018.

8. INS: Quatrième Enquête Camerounaise auprès des Ménages (ECAM 4). Accessible from http://www.statistics-cameroon.org/news.php?id=393

9. La e-santé : Télésanté, santé numérique ou santé connectée. July 2019Institut de recherche et documentation en économie de la santé. Accessible from https://www.irdes.fr/documentation/syntheses/e-sante.pdf

10. MEASURE Evaluation. 2019. «Health Information System (eHealth) Stages of Continuous Improvement (SOCI).» Chapel Hill. Accessible from https://www.measureevaluation.org/eHealth-strengthening-resource-center/eHealth-stages-of-continuous-improvement-toolkit

11. Ministère de la Santé Publique. 2016. Stratégie Sectorielle de la Santé. http://www.minsante.gov.cm/site/?q=fr/content/strat%C3%A9gie-sectorielle-de-sant%C3%A9-2016-2027-1

12. MINSANTE. 2015 May. Recueil des textes organiques du Ministère de la Santé Publique.

13. MINSANTE/DRH. 2012. Plan de développement des ressources humaines PDRH: État des lieux et diagnostic. Completed based on the organigram of 2013, cited by the SSS 2016-2027.

14. Organisation mondiale de la Santé (OMS) et Union internationale des télécommunications (UIT). 2013. "Guide pratique sur les stratégies nationales en matière de cybersanté." Genève. Accessible from https://www.afro.who.int/fr/publications/guide-pratique-sur-les-strategies-nationales-en-matiere-de-cybersante

15. Public Health Informatics Institute. 2019. «Informatics Savvy Health Department Tool Kit.» Decateur. Accessible from https://www.phii.org/info-savvy/self-assessment-tools

16. Understanding Healthcare Vocabularies & Code Sets. 18 November 2013. Accessible from https://datica.com/blog/understanding-healthcare-vocabularies-code-sets/

17. WHO guideline: recommendations on digital interventions for health system strengthening. 2019. Accessible from https://www.who.int/publications-detail/who-guideline-recommendations-on-digital-interventions-for-health-system-strengthening

18. World Bank Ease of Doing Business Rankings. 2019. Accessible from https://www.doingbusiness.org/en/rankings?region=sub-saharan-africa

APPENDIX

Table 17: Detailed Budget for the Governance and Leadership Component (SO1)

1. BY 2024, IMPROVE GOVERNANCE AND LEADERSHIP IN DIGITAL HEALTH

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Quantity**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
1.1 By 2021, establish a national committee for oversight and coordination of digital health activities	Develop a draft act creating the national committee to oversee digital health coordination	Organize a drafting workshop for the draft act to create the National Committee for the Supervision of Digital Health Coordination	1	3 000 000	3 000 000	3 000 000	-	-	-	-
	Establishment of a digital health communication plan	Organize a workshop to develop RDTs for the recruitment of a consultant to develop a communication plan for digital health	1	3 000 000	3 000 000	3 000 000	-	-	-	-
		Recruit a consultant for the development of the digital health communication plan	1	8 500 000	8 500 000	8 500 000	-	-	-	-
		Organize a validation workshop for the eHealth communication plan	1	3 000 000	3 000 000	3 000 000				
1.2 By 2024, define processes and procedures to ensure compliance of digital health interventions with standards, policies and the legislative and regulatory framework	Preparation of the national digital health blueprint	Organize a workshop to develop RDTs for the recruitment of a research firm	1	3 000 000	3 000 000	3 000 000				
		Recruit a research firm to develop the national digital health blueprint	1	40 000 000	40 000 000	40 000 000				
		Organize a workshop to validate the national digital health blueprint	1	3 000 000	3 000 000	3 000 000				
		Disseminate the national digital health blueprint	4 000	8 000	32 000 000	6 400 000	6 400 000	6 400 000	6 400 000	6 400 000

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Quantity**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
	Organization of convention signing ceremonies	Organize a workshop to develop draft conventions (for informational purposes only)	-	-	-	-	-	-	-	-
		Organize conventions signing ceremonies (for informational purposes only)	-	-	-	-	-	-	-	-
1.3 By 2024, develop and disseminate the clinical safety policy document for digital health, including the legislative and regulatory framework for digital health (Promoting clinical safety in digital health)	Development of the clinical safety policy document	Organization of a workshop to develop RDTs for the recruitment of a consultant	1	3 000 000	3 000 000	-	3 000 000	-	-	-
		Recruitment of a consultant to support the development process of the clinical safety policy document on digital health	1	10 500 000	10 500 000	-	10 500 000	-	-	-
		Organization of validation workshops for the clinical safety policy document	1	3 000 000	3 000 000	-	3 000 000	-	-	-
		Produce the clinical safety policy document	4 000	4 000	16 000 000		4 000 000	4 000 000	4 000 000	4 000 000
	Dissemination of the clinical safety policy document	Organize extension workshops	11	6 000 000	66 000 000		18 000 000	18 000 000	18 000 000	12 000 000
1.4 By 2024, have a strategic document on Availability, Incident Management, Accessibility, Service Delivery and Change Management	Development of the strategic document describing the management of availability, incidents, accessibility, service delivery and change	Organize a TOR preparation workshop for the recruitment of an international expert	1	3 000 000	3 000 000		3 000 000			

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Quantity**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
1.4 By 2024, have a strategic document on Availability, Incident Management, Accessibility, Service Delivery and Change Management	Development of the strategic document describing the management of availability, incidents, accessibility, service delivery and change	Recruit a consultant to support the process of developing the strategic document describing the management of availability, incidents, accessibility, service delivery and change	1	10 500 000	10 500 000		10 500 000			
		Organize a strategic document validation workshop describing the management of availability, incidents, accessibility, service delivery and change	1	3 000 000	3 000 000		3 000 000			
		Organize a strategic document retrieval meeting describing the management of availability, incidents, accessibility, service delivery and change	1	1 500 000	1 500 000		1 500 000			
1.5 By the end of 2020, develop a Monitoring Plan - Evaluation of the implementation of the Strategic Digital Health Plan.	Development of the Monitoring Plan - Evaluation of the implementation of the Strategic Digital Health Plan.	Organize a workshop for the development of TORs for the recruitment of a firm	1	3 000 000	3 000 000	3 000 000				
		Recruit a research firm for the development of the Monitoring Plan - Evaluation of the implementation of the Strategic Plan for Digital Health	1	10 500 000	10 500 000	10 500 000				

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Quantity**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
1.5 By the end of 2020, develop a Monitoring Plan - Evaluation of the implementation of the Strategic Digital Health Plan.	Development of the Monitoring Plan - Evaluation of the implementation of the Strategic Digital Health Plan.	Organize a validation workshop for the Monitoring Plan - Evaluation of the implementation of the Strategic Plan for Digital Health	1	3 000 000	3 000 000	3 000 000				
		Produce the monitoring and evaluation plan document	200	4 000	800 000	800 000				
		Disseminate the monitoring and evaluation plan	11	3 000 000	33 000 000	33 000 000				
	Development of the sustainability plan for project achievements	Organize a workshop to develop TORs for the recruitment of a consultant	1	3 000 000	3 000 000	3 000 000				
		Recruit a consultant for preparation of the sustainability plan (funding, human resources and infrastructure)	1	8 500 000	8 500 000	8 500 000				
		Organize a validation workshop for the sustainability plan	1	3 000 000	3 000 000	3 000 000				
		Produce and disseminate the sustainability plan document	100	8 000	800 000	800 000				
TOTAL					**277 600 000**	**135 500 000**	**62 900 000**	**28 400 000**	**28 400 000**	**22 400 000**

Table 18: Detailed Budget for the Legislation, Policies and Compliance Component (SO2)

2. BY 2024, STRENGTHEN THE LEGAL AND REGULATORY FRAMEWORK FOR DIGITAL HEALTH.

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Quantity**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
2.1 By 2024, develop and disseminate the clinical safety policy document for digital health, including the legislative and regulatory framework for digital health (Promoting clinical safety in digital health)	Development of ethical promotion document for digital health	Organize a TOR preparation workshop for the recruitment of a consultant	1	3 000 000	3 000 000	-	3 000 000	-	-	-
		Recruit a consultant to support the process of developing the ethical health promotion document for digital health	1	8 500 000	8 500 000	-	8 500 000	-	-	-
		Organize a validation workshop for the policy and ethics document	1	3 000 000	3 000 000	-	3 000 000	-	-	-
		Produce the document promoting ethics in digital health	4 000	4 000	16 000 000		4 000 000	4 000 000	4 000 000	4 000 000
		Organize dissemination workshops	11	3 000 000	33 000 000		9 000 000	9 000 000	9 000 000	6 000 000
	Development of draft legal texts in digital health	Recruit a consultant to evaluate the legal framework in the digital health field	1	8 500 000	8 500 000	-	8 500 000			
		Organize a validation workshop for the document detailing digital health needs and draft legislation in Cameroon	1	3 000 000	3 000 000	3 000 000	-			
TOTAL					**75 000 000**	**3 000 000**	**36 000 000**	**13 000 000**	**13 000 000**	**10 000 000**

Table 19: Detailed Budget for the Human Resources Component (SO3)

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Quantity**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
3.1 By 2020, assess the quantity and quality needs of health personnel who are to use the eHealth system.	Census of health personnel	Organize a workshop to develop TORs for health sector staffing			-	-				
		Conduct census of health sector staff	1	20 000 000	20 000 000	20 000 000				
		Organize a workshop to prepare the survey report	1	3 000 000	3 000 000	3 000 000				
3.2 By 2022, have target personnel trained in the use of the computer tool.		Organize a workshop to develop the staff capacity-building plan	1	3 000 000	3 000 000	3 000 000				
		Organize a workshop to develop TORs for training in the use of the 1st-level computer tool	1	3 000 000	3 000 000	3 000 000				
		Organize training sessions for health personnel on the use of computers at all levels of the health pyramid	10	7 500 000	75 000 000		75 000 000			
			10	4 000 000	40 000 000	0	0		40 000 000	
		Organize a workshop for to revise training curricula for computer and health professionals	2	3 000 000	6 000 000	3 000 000			3 000 000	

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Quantity**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
3.3 By 2024, have at least one ICT specialist in every district hospital.	Capacity-building for ICT professionals in computer maintenance	Organize a workshop to develop TORs for the training of trainers	1	3,000,000	3,000,000			3,000,000		
		Organize training of trainers sessions	1	4,000,000	4,000,000				4,000,000	
3.4 By 2022, have at least 10 eHealth application developers and 10 system administrators at the central level.	Capacity-building for application developers in the digital health field	Acquisition of digital health application development platforms	1	30 000 000	30 000 000	0	15 000 000			
		Organize a workshop for the development of training TORs	1	3 000 000	3 000 000	3 000 000				
		Organize refresher training sessions to build the capacity of digital health application developers	5	4 000 000	20 000 000	4 000 000	4 000 000	4 000 000	4 000 000	4 000 000
	Capacity-building for system administrators in the digital health field	Organize a workshop for the development of training TORs	1	3 000 000	3 000 000	3 000 000				
		Organize refresher training sessions for capacity building of system administrators	5	4 000 000	20 000 000	4 000 000	4 000 000	4 000 000	4 000 000	4 000 000
	TOTAL				**233 000 000**	**46 000 000**	**98 000 000**	**11 000 000**	**55 000 000**	**8 000 000**

Table 20: Detailed Budget for the Strategy and Investments Component (SO4)

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Quantity**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
4.1 Ensure the mobilization of national resources for financing the provision of digital health services	Program Digital Health Financing (Mobilizing Matching Funds) (for guidance purposes)	Organize a workshop for the development of annual digital health funding plans			-		-	-	-	-
	Program Digital Health Financing (Mobilizing Matching Funds) (for guidance purposes)	Develop digital health investment projects		-	-					
		Include well-developed investment projects in digital health in the Medium Term Expenditure Framework (MTEF)		-	-					
	Create a digital health financing budget (for guidance purposes)	Budget for digital health investment projects		-	-					
4.2 Strengthen the national and international partnership for digital health	Organization of advocacy meetings to mobilize financial resources for digital health (for guidance purposes)	Develop a map and a directory of stakeholders in the financing of digital health			-	-				
		Organize 5 advocacy meetings to mobilize financial resources for digital health	5	200 000	1 000 000	200 000	200 000	200 000	200 000	200 000

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Quantity**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
4.2 Strengthen the national and international partnership for digital health	Sign agreements (MOU) with private companies, CSOs, TFPs and partner administrations to mobilize funding for digital health	Organize agreement validation workshops with private companies, CSOs, TFPs and partner administrations to mobilize funding for digital health.		-	-	-				
		Organize ceremonies to sign agreements with private companies, CSOs, PTFs and partner administrations to mobilize funding for digital health.		-	-	-	-	-	-	-
4.3 Establish a Digital Health Investment Fund	Establishment of a Digital Health Investment Fund (On an indicative basis)	Develop the formal framework for creating the Digital Health Investment Fund		-	-					
		Develop investment fund follow-up tools for digital health			-	-				
	TOTAL				**1 000 000**	**200 000**	**200 000**	**200 000**	**200 000**	**200 000**

Table 21: Detailed Budget for the Services and Applications Component (SO5)

5. BY 2024, DEVELOP SERVICES AND APPLICATIONS TO MEET THE NEEDS OF INDIVIDUALS, CAREGIVERS, MANAGERS AND ADMINISTRATORS

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Quantity**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
5.1 By 2024, establish a UHC information management system in 50% of health facilities.	Develop IT tools for the medical, administrative and financial management of the UHC	Organize a working session with 20 participants to prepare consultant TORs	1	1 000 000	1 000 000	1 000 000				
		Recruit a consultant to design and adapt the chosen application (30 days)	30	250 000	7 500 000	7 500 000				
		Organize a workshop to review and validate the consultant's work (20persx10day)	20	1 000 000	20 000 000	20 000 000				
	Roll out the tools developed in the targeted structures	Host and introduce the tools developed (monthly over 5 years)	60	800 000	48 000 000	9 600 000	9 600 000	9 600 000	9 600 000	9 600 000
		Organize a training of trainers workshop on the development, deployment and configuration of medical, administrative and financial management of the CSU (200 people x 10 days per DS)	200	1 000 000	200 000 000		200 000 000			
		Organize a training workshop for users of the application at the FOSA level (2persx3day / DS)	400	150 000	60 000 000		12 000 000	12 000 000	12 000 000	12 000 000
		Ensure corrective annual maintenance and scalable tools developed	4	5 000 000	20 000 000		50 000 000	50 000 000	50 000 000	50 000 000

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
5.2 By 2024, put in place an integrated national HMIS management system in 70% of health facilities	Expand implementation of the Electronic Medical Record (EMR)	Recruitment of a consultant to develop a map of existing patient management software in Cameroon for accreditation (DAMA, Vindata, OpenMrs, etc.) (30days)	30	250 000	7 500 000	7 500 000				
		Develop specifications for the EMR		PM						
		Organize a working session with 30 participants to adopt specifications for the EMR	1	1 000 000	1 000 000	1 000 000				
		Recruit a consultant to develop EMR (90days) interoperable with existing subsystems	180	250 000	45 000 000	45 000 000				
		Organize a workshop to pretest and validate the tools developed (15persx7days)	15	700 000	10 500 000	10 500 000				
		Organize a training of trainers workshop on the development, deployment and configuration of the EMR (1persx200DSx5days)	200	250 000	50 000 000	50 000 000				
		Organize a training workshop for users of the DME application at the FOSA level (2persx3000FOSAx2days)	6000	100 000	600 000 000		5 250 000	5 250 000		
		Server settings in the 10 regions (3persx5days)	30	600 000	18 000 000	9 000 000	9 000 000			
		Install and cascade the DME into the FOSA (2persx2daysx3000FOSA)	3000	50 000	150 000 000		150 000 000	150 000 000	150 000 000	150 000 000

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
5.2 By 2024, put in place an integrated national HMIS management system in 70% of health facilities	Expand implementation of the Electronic Medical Record (EMR)	Workshop to validate SOP and DME user manuals (30persx3days)	30	450 000	13 500 000	13 500 000				
		Develop a proposal to set up 10 regional pools to support FOSA EMR users		PM	-					
		Quarterly supervisory training mission of the EMR in the 10 regions (2persx5days)	20	2 000 000	40 000 000		3 375 000	3 375 000	3 375 000	3 375 000
		Recruit a consultant to develop the complementary health facility management modules over 30days (logistics of laboratories, finances, pharmaceuticals, and vaccines)	30	500 000	15 000 000		7 500 000		7 500 000	
	Develop tools for the logistics management of laboratories, pharmaceuticals, and vaccines	Training workshop for actors from central and regional levels to utilize GIS web platform data. (35persX5days)	35	250 000	8 750 000	4 375 000	4 375 000			
		Recruitment of an IT firm for corrective and scalable maintenance of the SIGLe modules at the DPML and FRPS levels.	1	16 000 000	16 000 000	16 000 000				
		Workshop to develop computer procedures and training in the administration and securing of the SIGLe data extraction module and SAGE 100c v4 software in FRPS and CENAME. (30persX8days)	30	400 000	12 000 000	6 000 000		6 000 000		
		Regional workshops to strengthen the capacities of FRPS staff in the operation and installation of the Commercial Management, Accounting and Pilot Edition modules of the SAGE 100 C software under SQL SERVER / EXPRESS. (12persX5daysX3regions)	36	250 000	9 000 000	2 250 000	2 250 000	2 250 000	2 250 000	

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
5.2 By 2024, put in place an integrated national HMIS management system in 70% of health facilities	Develop tools for the logistics management of laboratories, pharmaceuticals, and vaccines	Computer specifications development workshop specifying the requirements for a SIGLe integrated into the FOSA. (20persX10days)	20	500 000	10 000 000	10 000 000				
		Recruitment of a IT firm in charge of GIS development / configuration	1	50 000 000	50 000 000	50 000 000				
		Training workshop for administrators and trainers on GIS software systems (20persX10days)	20	500 000	10 000 000		5 000 000		5 000 000	
		Software systems deployment missions to the operating sites (20persX15days)	20	750 000	15 000 000	3 000 000	3 000 000	3 000 000	3 000 000	3 000 000
		Training of SIGLe users at all levels of the health pyramid. (25persX4daysX5regions)	125	200 000	25 000 000	5 000 000	5 000 000	5 000 000	5 000 000	5 000 000
		Implementation of a support contract for corrective and scalable maintenance of GIS software systems	1	20 000 000	20 000 000			10 000 000		10 000 000
	Provide longitudinal follow-up of patients in target programs	Workshop for configuration of the electronic directories in the software DHIS2 tracker (15persx10days)	15	1 500 000	22 500 000					
		Develop the procedures manual and training modules for the DHIS2 tracker module (15persx4days)	30	450 000	13 500 000					
		Organize a training of trainers workshop for the DHIS2 tracker module (15persx5days)	15	750 000	11 250 000					
		Organize user training for the DHIS2 tracker module (2persx3daysx3000FOSA)	6000	100 000	600 000 000		150 000 000	150 000 000	150 000 000	150 000 000

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
5.2 By 2024, put in place an integrated national HMIS management system in 70% of health facilities	Provide longitudinal follow-up of patients in target programs	Quarterly supervisory training mission for the DHIS2-Tracker in the 10 regions (2persx2daysxsite)	20	600 000	12 000 000					
		Organize annual scalable maintenance workshops for the DHIS2-Tracker software (15persx5days)	15	750 000	11 250 000		150 000 000	150 000 000	150 000 000	150 000 000
	Set up an automated system for reporting vital events (births and deaths)	Standardization Workshop for Birth and Death Declaration Forms (20persx3days)	20	450 000	9 000 000	9 000 000				
		Recruitment of a consultant for the implementation of a unique patient identification system (90 days)	90	250 000	22 500 000		22 500 000			
		Develop the procedures manual and training modules for the birth and death registration module (15persx4days)	15	600 000	9 000 000	9 000 000				
		Workshop to configure the electronic directories in the software DHIS2 tracker (15persx10days)	15	1 500 000	22 500 000	22 500 000				
		Organize a training of trainers workshop on the birth and the death declaration module (15persx5days)	15	750 000	11 250 000					
		Organize training of users on the birth and death declaration module (2persx3daysx3000FOSA)	6000	100 000	600 000 000		150 000 000	150 000 000	150 000 000	150 000 000
	Set up a notification system for public health events	Public health events notification system configuration workshop (15persx10days)	15	1 500 000	22 500 000	22 500 000				
		Workshop to develop the procedures manual for the public health events notification system (15persx4days)	15	600 000	9 000 000	9 000 000				

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
5.2 By 2024, put in place an integrated national HMIS management system in 70% of health facilities	Set up a notification system for public health events	Cascade training on public health event risk mapping (2pers x 190 districts x 2days)	380	80 000	30 400 000		30 400 000			
		Organize joint (MOH/MINATD) public health event risk mapping missions in the 10 regions (5pers x 190 districts x 10days)	950	250 000	237 500 000		2 250 000	2 250 000	2 250 000	2 250 000
		Joint supervisory training mission for the public health events notification system in the 10 regions (2persx2daysxsite)	20	600 000	12 000 000		7 600 000	7 600 000	7 600 000	7 600 000
	Integrate all parallel systems for health data collection at the SNIS	Identify existing health data collection systems								
	Ensure the continued operation of all data storage platforms	Workshop to adopt national indicators to be integrated into the SNIS (20 prs x 3days)	20	300 000	6 000 000	6 000 000				
		Workshop to integrate new indicators into the national system (15prs x 5days)	15	500 000	7 500 000	7 500 000				
		Workshop to import historical data on the new indicators into the national system (15prs x 5days)	15	500 000	7 500 000	7 500 000				
		Pay hosting fees for the national data management and storage platform ($1000 x 12months x 5 years)	60	500 000	30 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000
		Document functional maintenance of the national data storage platform		PM	-					
		Pay internet connection fees for actors at all levels (HD, region) to manage data (190 HD +10 Regions X 25,000/month)	60	5 000 000	300 000 000	60 000 000	60 000 000	60 000 000	60 000 000	60 000 000

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
5.2 By 2024, put in place an integrated national HMIS management system in 70% of health facilities	Ensure the continued operation of all data storage platforms	Produce the data storage platform SOP manual (500 copies) HD, Regions, programs, technical departments, safety stock)	500	20 000	10 000 000		10 000 000			
		Distribute the data storage platform SOP manual		PM						
	Ensure data quality at all levels of the pyramid	Organize quarterly oversight missions on data quality from the district to the FOSA level (20 persx5days)	20	1 000 000	20 000 000	4 000 000	4 000 000	4 000 000	4 000 000	4 000 000
		Organize quarterly oversight missions on data quality from the regions to the districts	20	1 000 000	20 000 000	4 000 000	4 000 000	4 000 000	4 000 000	4 000 000
		Organize quarterly oversight missions on data quality from the central level to the regions	20	1 500 000	30 000 000	6 000 000	6 000 000	6 000 000	6 000 000	6 000 000
	Ensure data validation at all levels	Organize quarterly regional data validation workshops (4pools, 50 persx3days)	200	300 000	60 000 000	12 000 000	12 000 000	12 000 000	12 000 000	12 000 000
		Organize quarterly data validation workshops at the central level (30 persx3days)	30	1 200 000	36 000 000	7 200 000	7 200 000	7 200 000	7 200 000	7 200 000
	Develop a management manual and data quality assurance	Develop data management and quality assurance manual (20 prs x5 days)	20	500 000	10 000 000			10 000 000		
		Produce data management and quality assurance manual (500 copies)	500	10 000	5 000 000			5 000 000		
		Distribute data management and quality assurance procedures manual at all levels		-	-					

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
5.2 By 2024, put in place an integrated national HMIS management system in 70% of health facilities	Train decision makers at different levels of the health pyramid to use data (decision support tools)	Organize data usage training sessions for decision makers at the HD and regional levels (200 pers *3days)	200	150 000	30 000 000			30 000 000		
		Organize data usage training sessions for decision makers at the central level (50 pers*2days)	50	200 000	10 000 000			10 000 000		
		Hold quarterly meetings of the Cameroon Health Data Colaborative (CHDC)	250	100 000	25 000 000	5 000 000	5 000 000	5 000 000	5 000 000	5 000 000
		Hold biannual data usage best practices meetings with HDs (4pools, 50persx1day)	200	100 000	20 000 000	4 000 000	4 000 000	4 000 000	4 000 000	4 000 000
	Build capacity in data management and analysis at all levels of the pyramid	Develop a data management training needs map	PM		-					
		Organize training of trainers workshops on data management	20	500 000	10 000 000		10 000 000			
		Organize capacity-building workshops for HDs on data entry and analysis	200	200 000	40 000 000		20 000 000	20 000 000		
	Promote, disseminate health data and results of health research	Workshops to develop digital portals (NPHO, CDNSS) for data dissemination	50	1 000 000	50 000 000	20 000 000	15 000 000	5 000 000	5 000 000	5 000 000
		Produce quarterly epidemiological bulletins	1000	20 000	20 000 000	4 000 000	4 000 000	4 000 000	4 000 000	4 000 000
		Produce and distribute monitoring report on 100 key health indicators	500	50 000	25 000 000	5 000 000	5 000 000	5 000 000	5 000 000	5 000 000
		Hold a conference on health data every two years		PM	-					
		Conduct two evaluations (mid-project and final) on the impact of data usage on health indicators	2	25 000 000	50 000 000		25 000 000			25 000 000

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
5.3 By 2024, develop telemedicine and mobile applications for the community, patients and service providers, and health care	Set up a telemedicine platform in Cameroon	Workshop to define and prioritize telemedicine service offerings (30persx3days)	30	450 000	13 500 000	13 500 000				
		Award 10 grants to Cameroonian start-ups to develop applications dedicated to priority telemedicine service offerings	10	5 000 000	50 000 000		25 000 000		25 000 000	
		Mass-media campaign (television, radio, newspapers, posters) to publicize telemedicine offerings in Cameroon	1	10 000 000	10 000 000		5 000 000		5 000 000	
		Capacity-building workshop for health personnel on optimal telemedicine usage in the 10 regions (30persx3days)	300	450 000	135 000 000					
	Set up mechanisms for MOH to communicate with target populations through mobile technologies	Workshop to identify needs and priority communication and content development media (information and alerts) to be distributed: medical information to physicians, researchers and patients (30persx3days)	30	300 000	9 000 000	4 500 000		4 500 000		
		Mass media campaign (television, radio, newspapers, posters), educational and awareness-raising campaigns in the area of digital health	2	10 000 000	20 000 000		10 000 000		10 000 000	
		Sign agreements with mobile providers to send push messages	5	5 000 000	25 000 000	1 800 000	1 800 000	1 800 000	1 800 000	1 800 000
	TOTAL				**4 235 400 000**	**521 225 000**	**1 220 912 500**	**922 637 500**	**874 387 500**	**854 637 500**

Table 22: Detailed Budget for the Infrastructure Component (SO6)

6. BY 2024, DEVELOP HEALTH INFORMATION PROCESSING AND SHARING INFRASTRUCTURES BETWEEN HEALTH STRUCTURES AND COMMUNITIES AT NATIONAL AND INTERNATIONAL LEVELS

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
6.1 By 2022, ensure the availability of quality physical technology infrastructure in 70% of targeted health facilities	Strengthen high and medium throughput connectivity in targeted health facilities	Make an inventory of existing network infrastructures at all levels of the health pyramid (3pers x 4 days x 40,000)	1	1 000 000	1 000 000	1 000 000				
		(regional decentralization to internet service providers)	80	2 000 000	160 000 000	64 000 000	48 000 000	16 000 000	32 000 000	
		Acquisition and installation of high-speed interconnection infrastructures for the 80 target health structures (3,000,000 equipment / site x 80 sites)	80	24 000 000	1 920 000 000		768 000 000	768 000 000	192 000 000	192 000 000
		Annual 2Mbps broadband interconnection fee for the 80 target health structures (6,000,000 / yr. royalty over 4yrs x 80 sites)	60	800 000	48 000 000	9 600 000	9 600 000	9 600 000	9 600 000	9 600 000
		Acquire, deploy and put into service infrastructures and services for the 2500 health structures according to identified priority needs (acquisition SIM DATA 200,000,000 + monthly payment 250,000,000)			237 000 000	94 800 000	71 100 000	23 700 000	47 400 000	
	Strengthen the computer stock in the targeted health structures	Define minimum requirements in services and computer equipment at all levels of the health pyramid (localized in the 3000 targeted health structures: 2pers x 190DS x 5 days x 25,000)	2	23 750 000	47 500 000	19 000 000	28 500 000			
		Installation of the CAD for the acquisition and commissioning of computer equipment in the targeted health structures (organize a work session with 10 participants)	PM	PM						

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
6.1 By 2022, ensure the availability of quality physical technology infrastructure in 70% of targeted health facilities	Strengthen the computer stock in the targeted health structures	Acquisition and commissioning of IT equipment in targeted health facilities: HR, HD, CMA (3,000,000 / sites x 500)	500	3 000 000	1 500 000 000	600 000 000	450 000 000	450 000 000		
		Acquisition and commissioning of IT equipment in targeted health facilities: CSI (500,000 / sites x 2500)	2 500	500 000	1 250 000 000	500 000 000	375 000 000	375 000 000		
	Strengthen interconnection (intranet / messaging) between health structures	Organize a working session to develop the terms of reference and the call for applications document for the design and implementation of an interconnection platform (messaging / intranet)	2	100 000	200 000	200 000				
		Recruit a consultant to implement the contract requirements (identification of interconnection points and specification of technical characteristics necessary for physical and logical interfaces) (90 days x 300,000)	90	300 000	27 000 000	13 500 000	5 400 000	5 400 000	1 350 000	1 350 000
		Acquisition of computer hardware for deployment of the interconnection platform (50,000,000)	1	50 000 000	50 000 000	25 000 000	25 000 000			
	Strengthen the maintenance of IT equipment and networks	Conduct an assessment of equipment maintenance (localized in the 3000 targeted health facilities: 2 x 190pers x 5 days x 25,000)	5	9 500 000	47 500 000	19 000 000	14 250 000	4 750 000	4 750 000	4 750 000
		Installation of the CAD to contract maintenance (to develop a maintenance plan for computer equipment and networks)	1	100 000	100 000	100 000				
		Contract out computer and network equipment maintenance (50,000 / year x 3000)	1	150 000 000	150 000 000	60 000 000	45 000 000	15 000 000	15 000 000	15 000 000
		Monitor / evaluate quarterly implementation of computer and network equipment maintenance (2pers / 10R x 25,000) + (1pers x 25,000)	21	400 000	8 400 000	1 680 000	1 680 000	1 680 000	1 680 000	1 680 000

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
6.1 By 2022, ensure the availability of quality physical technology infrastructure in 70% of targeted health facilities	Set up alternative mechanisms to ensure the availability of electrical energy	Conduct an assessment of the availability and level of energy consumption in health facilities and alternative solutions (1 x 25,000 x 3000)	3 000	25 000	75 000 000	37 500 000	18 750 000	18 750 000		
		Organize a working session with 10 participants to validate the infrastructure evaluation report	PM	PM	0					
		Installation of the CAD for the acquisition and implementation of solutions for electrical energy services and backup	PM	PM	0					
		Acquire, install and implement solutions for electrical energy services and backup	PM	PM						
		Contract out the maintenance of electricity installations	PM	PM						
		Monitor the implementation of computer and network equipment maintenance	PM	PM						
6.2 By 2023, ensure availability of cloud-based platforms or services in 70% of targeted health facilities	Develop secure systems for storing health data	Conduct a study to identify health data storage solutions (CAMTEL, CAMPOST) (2pers x 25,000 x 1)	1	50 000	50 000	50 000				
		Organize a working session to analyze the study findings			0					
		Install the CAD for the acquisition and implementation of health data storage solutions at the central level			0					
		Acquire and install health data storage equipment at the central level	1	100 000 000	100 000 000	70 000 000	15 000 000	15 000 000		
	TOTAL				**6 024 670 000**	**1 686 750 000**	**2 000 680 000**	**1 738 280 000**	**384 180 000**	**214 780 000**

Table 23: Detailed Budget for the Standards and Interoperability Component (SO7)

7. BY 2024, DEVELOP THE STANDARDS AND INTEROPERABILITY COMPONENTS TO IMPROVE THE COLLECTION AND EXCHANGE OF CONSISTENT AND ACCURATE HEALTH INFORMATION ACROSS GEOGRAPHICAL AND SECTORAL BOUNDARIES.

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
7.1 By 2022, ensure the availability and application of ICT standards in 80% of health facilities at all levels of the health pyramid	Develop the standards framework	Organize a non-resident workshop to identify equipment, systems, services and data format to be standardized (30pers x 3 days)	30	300 000	9 000 000	9 000 000				
		Recruit a national consultant to assess existing standards (20 days)	20	250 000	5 000 000	5 000 000				
		Organize 2 workshops to develop standards where none exist and contextualize existing ones (30 pers x 3 days)	60	300 000	18 000 000	18 000 000				
		Organize a workshop to adopt the norms that suit our environment (30persx3days)	30	300 000	9 000 000	9 000 000				
		Produce, copy, and distribute validated standards (3 standards of 100 pages each, 5000 copies / standard)	15000	5 000	75 000 000	75 000 000				
By 2022, ensure the availability and application of ICT standards in 80% of health facilities at all levels of the health pyramid	Ensuring the secure exchange of data	Organize a workshop to develop secure transmission protocols (30persx3days)	30	300 000	9 000 000			9 000 000		
		Organize a validation workshop for secure transmission protocols (30persx3days)	30	300 000	9 000 000			9 000 000		
		Recruit a consultant to develop the security policy for data exchange (1 consultant x 45 days)	45	250 000	11 250 000		11 250 000			
		Organize a validation workshop for the secure data exchange policy	30	300 000	9 000 000		9 000 000			

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
By 2022, ensure the availability and application of ICT standards in 80% of health facilities at all levels of the health pyramid	Ensuring the secure exchange of data	Recruit a consultant to configure messaging and develop usage and administration procedures (1 consultant x 30 days)	45	250 000	11 250 000	11 250 000				
		Organize 2 technical preparatory meetings	40	15 000	600 000	600 000				
		Organize a workshop to configure messaging and develop usage and administration procedures (management rules)	30	300 000	9 000 000	9 000 000				
		Commission (effective deployment) Secure Messaging	1	2 000 000	2 000 000	2 000 000				
		Organize a workshop to develop user and administration manuals for secure messaging (30persx3days)	30	300 000	9 000 000	9 000 000				
		Organize a non-resident training of trainers workshop in use of secure messaging (30persx3days)	30	300 000	9 000 000	9 000 000				
		Organize 10 regional workshops to train users of secure messaging (30persx1day)	30	150 000	4 500 000	4 500 000				
		Issue payment to network security and information systems auditors/ experts	20	350 000	7 000 000				7 000 000	
		Carry out security audit missions of data exchange systems	30	50 000	1 500 000				1 500 000	
		Ensure physical security and logical data security (Acquire security certificates)	1	5 000 000	5 000 000			5 000 000		

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
By 2022, ensure the availability and application of ICT standards in 80% of health facilities at all levels of the health pyramid	Set up a software accreditation / certification system	Organize a workshop to develop the Manual of Software Accreditation Procedures (30persx3days)	30	300 000	9 000 000		9 000 000			
		Organize a validation workshop for software accreditation procedures manual (30persx3days)	30	300 000	9 000 000		9 000 000			
		Organize a meeting to adopt the Software Accreditation Procedures Manual (30persx1day)	30	15 000	450 000		450 000			
		Recruit a consultant to develop a platform for managing software accreditations	1	50 000 000	50 000 000		50 000 000			
		Organize software operations audit missions	200	200 000	40 000 000			13 333 333	13 333 333	13 333 333
	Develop systems interoperability standards	Organize a coding adoption workshop for the unique patient identifier (30persx3day)	30	300 000	9 000 000	9 000 000				
		Organize a national standard drug coding review workshop (30persx3day)	30	300 000	9 000 000	9 000 000				
		Organize a meeting to adopt a codified list of health facilities (30persx “day)	30	300 000	9 000 000		9 000 000			
		Organize a workshop to review and update the consolidated list of health facilities (30persx1day)	30	300 000	9 000 000				9 000 000	
		Organize a workshop to develop a dictionary of health data and metadata (30persx3days)	30	300 000	9 000 000		9 000 000			
		Organize a validation workshop for the dictionary of data and health metadata (30persx3days)	30	300 000	9 000 000		9 000 000			

						ANNUAL COST				
Specific Objective	**Activities**	**Task**	**Qty**	**Unit Cost**	**Total Cost**	**2020**	**2021**	**2022**	**2023**	**2024**
By 2022, ensure the availability and application of ICT standards in 80% of health facilities at all levels of the health pyramid	Develop systems interoperability standards	Organize a meeting to adopt the dictionary of health data and metadata (30persx1day)	30	15 000	450 000		450 000			
		Organize a workshop to review and update the data and health metadata dictionary (30persx3days)	30	300 000	9 000 000				9 000 000	
		Organize a workshop to develop the standardized document of health terminology (30persx3days)	30	300 000	9 000 000	9 000 000				
		Organize a validation workshop for the standardized health terminology document (30persx3days)	30	300 000	9 000 000	9 000 000				
		Organize a meeting to adopt the standardized document on health terminology (30persx1jour)	30	15 000	450 000	450 000				
		Organize a workshop to review and update the standardized document of health terminology (30persx3days)	30	300 000	9 000 000			4 500 000		4 500 000
		Recruit a consultant to develop a national registry of health personnel (1 consultant x 45 days)	1	50 000 000	50 000 000		50 000 000			
		Organize a validation workshop for the national registry of health personnel (30persx3days)	30	300 000	9 000 000		9 000 000			
		Organize a meeting to adopt the national registry of health personnel (30persx1day)	30	15 000	450 000		450 000			
		Organize a workshop to review and update the national registry of health personnel (30persx3days)	30	300 000	9 000 000				9 000 000	
	TOTAL				**480 900 000**	**197 800 000**	**175 600 000**	**40 833 333**	**48 833 333**	**17 833 333**

Table 24 ; Availability of Mobile Phones Observed per Region and by Type of Health Facility

	Mobile phone belonging to the health facility (A*)	Mobile phone belonging to the health facility (O**)	Private mobile phone, but airtime paid by the health facility (A)	Private mobile phone, but airtime paid by the health facility (O)	Private mobile phone bought by the owner but used by the health facility (A)	Private mobile phone bought by the owner but used by the health facility (O)
Region						
Adamawa	42,6	85,8	10,8	81,8	49,0	91,4
Centre (Yaoundé excluded)	14,3	76,8	15,6	83,4	78,2	90,1
East	43,1	59,8	18,7	82,0	46,7	96,3
Far North	41,0	62,4	20,5	71,7	72,6	85,8
Littoral (Douala excluded)	60,4	100,0	26,8	100,0	53,2	100,0
North	43,2	80,2	16,5	100,0	63,0	94,6
North West	81,6	91,5	15,5	86,3	23,8	90,7
West	20,6	88,3	13,0	88,4	61,8	94,3
South	7,4	63,6	9,1	100,0	46,2	92,1
South West	74,2	76,6	18,3	80,1	20,1	100,0
Douala	41,5	82,3	39,0	76,9	33,0	57,4
Yaoundé	23,1	75,4	34,5	77,7	49,9	82,7
Category of health facility						
IHC / Infirmary	28,2	78,4	18,6	82,4	57,9	87,1
MHC	46,3	82,5	42,5	84,8	31,5	88,1
District Hospitals / Military Hospitals	49,8	92,4	13,9	72,0	51,9	97,0
Clinics / Private practice/ Other	48,2	89,6	33,7	75,9	42,0	76,0
Health Facility Status						
Public	33,8	78,1	13,3	82,7	58,4	91,5
Private non-profit	41,8	81,4	28,9	89,2	54,4	88,6
Private for-profit	28,1	86,7	33,1	77,7	44,3	76,4
All	**33,2**	**81,3**	**23,1**	**81,6**	**52,7**	**86,3**

**A = Available, **O = Operational*

Source: IFORD: Survey of Health Services Delivery Indicators – Health Facility Assessment (SDI/HFA) 2018

Table 25 : Availability of Computers and the Internet Observed per Region and per Type of HF

	Computer belonging to the health facility (A)	Computer belonging to the health facility (O)	Private computer, but used by the health facility (A)	Private computer, but used by the health facility (O)	Access to the Internet by the health facility (A)	Access to the Internet by the health facility (O)
Region						
Adamawa	19,1	78,1	50,1	66,2	56,2	67,0
Centre (Yaoundé Excl)	16,5	76,6	20,1	52,8	24,3	65,4
East	31,1	70,4	19,4	85,1	26,9	75,6
Far North	28,8	83,7	17,1	76,5	25,7	88,7
Littoral (Douala excl.)	45,4	85,2	16,7	92,5	37,6	75,6
North	19,8	100,0	15,9	79,4	15,2	100,0
North West	45,1	87,1	14,1	84,5	22,0	88,5
West	12,2	82,9	9,8	74,1	18,7	98,0
South	21,8	86,8	13,0	100,0	14,4	100,0
South West	55,9	81,7	9,1	39,1	30,4	100,0
Douala	52,3	83,3	17,0	83,2	32,5	83,9
Yaoundé	42,5	76,7	21,1	74,8	33,3	63,7
Category of health facility						
IHC / Infirmary	22,1	78,1	12,5	68,1	21,8	73,7
MHC	60,8	79,9	30,0	68,5	37,4	76,7
District Hospitals / Military Hospitals	76,5	89,9	27,5	96,5	41,7	91,5
Clinics / Private practice / Other	57,3	89,7	28,1	80,4	46,8	92,7
Health Facility Status						
Public	18,4	75,7	14,1	69,9	17,1	78,1
Private non-profit	46,9	83,8	24,8	82,4	40,6	90,7
Private for-profit	42,9	83,6	16,3	65,1	33,4	72,1
All	**32,1**	**81,5**	**16,8**	**71,3**	**27,0**	**78,3**

** A = Available, ** O = Operational*

IFORD. 2018. Survey on Health Services Delivery Indicators – Health Facility Assessment (SDI/HFA).

Table 26: List of applications used in Cameroon

FUNCTIONALITY OF EXISTING SYSTEMS			
Data System	**System Summary**	**Current Status**	**SOP status**
Community and facility based systems			
1. OpenMRS EMR (Electronic Medical Record)	OpenMRS-based electronic medical record system called Bahmni, locally configured for the Cameroon health system patient-level data.	Planning for 10 sites	None
2. DAMA (Patient Registry Data Manager)	Electronic version of GRC health registers built in Microsoft C#.NET programming language that generates reports for MoH and PEPFAR	Functional in PEPFAR area, 154 sites	No documentation
3. BLIS (Basic Lab Information System)	Laboratory based software for electronic lab results and quality assurance	Functional in 10 labs of high volume sites	Documentation/SOPs in progress with C4G
4. N-SAMBA/ CommCare	Dimagi/Commcare developed platform for beneficiary registration and case management; data collection on smartphones/tablets to flow to cloud-based server	Functional pilot in 8 drop-in centers	SOPs in place for data collection and analysis, not data use
5. VINDATA	Java/Linux-based software needing LAN connection for HIV drug/stock management	Functional in PEPFAR area, 29 high volume sites	Training manuals but no SOPs
National/Sub-national information systems			
6. OSP-SIDA	Regional level web-based reporting on pharmacy/supply counts at facilities	Scaled up in all 10 regions	
7. DHIS 2-CIS	Web based software that permits compilation and analysis of health indicators at district, regional, national level	Scaled up in all districts, about 6000 facilities	Data collection guideline in place
8. DHIS 2 -NACC	Web-based software that permits compilation and analysis of HIV indicators at district, regional, national level	Scaled up in all districts, about 6000 facilities	User guide exists but not used at scale

Tableau 27 : Summary of System Functionalities

	DAMA	BLIS	NSAMBA	DHIS2	BAHMNI EMR	VINDATA
Licensing	Proprietary under CoAg	Open Source	Mixed, charged to IP	Open Source	Open Source	Proprietary, charged direct to health facility or NACC
Number of facilities implementing	154	10	8	1	0	29
Number of partners using system	1, CBC	1, GHSS	1, CHAMP	2, NACC AND CIS	1, ICAP	1, VINDATA SOLUTIONS
Interface software	C#.NET	PHP	Commcare	Java	Java	Java, Struts
Database software	SQL Express	MySQL	MySQL	MySQL	MySQL	Unknown
Use of international data standards	No standards incorporated to date	No standards incorporated to date	No standards incorporated to date	SDMX-HD API	Internationally coded concept dictionary, HL7 and FHIR APIs	No standards incorporated to date
Potential interoperability	Need additional development	Some development done	Need additional development	Available	Available	Need additional development
Data Addressed	HIV C&T Registers, MCH Registers, Lab Results Registers	Lab Results	Linkage to Care	Indicators	HIV C&T Data	Dispensing
Documentation de système	Guide de utilisateur en cours	Aide intégré	Inconnu	Documentation en ligne, guide de utilisateur du Cameroun	Inconnu	Aucun

[35] Flowers, J, L Buback, and P Hazelton. 2018 February.
Cameroon HIS Landscape Assessment and Recommendations Report. Prepared for the US Centers for Disease Control and Prevention.

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