



SUMMARY: TECHNICAL SPECIFICATION FOR TELEMEDICINE ENABLING ENVIRONMENT

LHSS UKRAINE

Local Health System Sustainability Project
Task Order 1, USAID Integrated Health Systems IDIQ

Local Health System Sustainability Project

The Local Health System Sustainability Project (LHSS) under the USAID Integrated Health Systems IDIQ helps low- and middle-income countries transition to sustainable, self-financed health systems as a means to support access to universal health coverage. The project works with partner countries and local stakeholders to reduce financial barriers to care and treatment, ensure equitable access to essential health services for all people, and improve the quality of health services. Led by Abt Global LLC, the five-year project will build local capacity to sustain strong health system performance, supporting countries on their journey to self-reliance and prosperity.

Recommended Citation: The Local Health System Sustainability Project (LHSS) under the USAID Integrated Health Systems IDIQ. June 2024. *Summary: Technical specification for telemedicine enabling environment.* Rockville, MD: Abt Global LLC.

Date: June 2024

Submitted to: Scott Stewart, COR
Office of Health Systems
Bureau for Global Health, USAID

Paola Pavlenko, Activity Manager
Senior Health Project Management Specialist (health systems, e-Health)
Office of Health, USAID Regional Mission to Ukraine

Submitted by: Abt Global LLC
6130 Executive Blvd., Rockville, MD 20852
(301) 347-5000

USAID Contract No: 7200AA18D00023 / 7200AA19F00014.

This summary was made possible by the support of the American people through the U.S. Agency for International Development (USAID). The contents are the sole responsibility of the authors and do not necessarily reflect the views of USAID or the U.S. Government.

DEVELOPMENT OF TECHNICAL SPECIFICATIONS FOR AN ENABLING ENVIRONMENT FOR TELEMEDICINE

At the end of 2022, the Local Health System Sustainability project (LHSS) analyzed the development of telemedicine in Ukraine and found a significant increase in the demand for telemedicine services in the previous few years. This was due to a combination of the COVID-19 epidemic and full-scale war initiated by Russia against Ukraine. However, in the absence of a unified coordinated strategy and requirements for the development of telemedicine services, each region, healthcare institution, or provider of telemedicine systems and equipment developed telemedicine according to their own discretion, based on the needs of regions, institutions, and patients.

In 2023, LHSS supported the Government in drafting and ultimately approving a national Strategy for the Development of Telemedicine in Ukraine. In this strategy, one of the priority tasks was to define and further develop priority telemedicine services. This includes the development of technical models, algorithms, and business processes for interaction during the provision of medical assistance using telemedicine, as well as expansion of the functionality of the central database of the electronic health record system (EHRS) and medical information systems (MIS) in the field of telemedicine.

In response to a request from the Ministry of Health (MoH) of Ukraine, LHSS conducted an analysis of the existing functionality of the EHRS, then held numerous discussions and seminars with key stakeholders to determine key priorities and needed enhancements. Stakeholders included the National Health Service of Ukraine, the State-Owned Enterprise "Electronic Health" (hereafter SOE "Electronic Health"), representatives of the Interagency Working Group of the MoH of Ukraine on the development of telemedicine in Ukraine, and representatives of the private sector. Based on this information, LHSS then proposed a technical model for the development of three telemedicine components (teleconsultation, telemetry, and teleradiology) and pathways for their integration with the central database of the EHRS.

As a result, LHSS prepared three technical documents in Ukrainian, describing the specifications for the development of corresponding telemedicine functionality at the level of the EHRS central database.

SPECIFICATION OBJECTIVES

LHSS supported the MoH in developing technical specifications for telemedicine to achieve the following objectives:

- Provide conditions for the organization of medical assistance using telemedicine at the level of the central database of the EHRS and in interaction with various medical information systems, telemedicine solutions, and platforms.
- Implement standards and mechanisms for the exchange of medical diagnostic data, including their recording at the central level of the EHRS.
- Improve conditions for the registration in the EHRS central database of events related to the provision of medical services using telemedicine, including the verification of participants and outcomes of the interaction.

AUDIENCE

The developed technical specifications for an enabling environment for telemedicine are intended for the MoH of Ukraine, the National Health Service of Ukraine, and the SOE "Electronic Health",

with the purpose of their further use in the development of functionality for teleconsultation, telemetry, and teleradiology at the central level of the EHRS.

CONTENT

The three technical specifications that have been developed are structured in accordance with the widely accepted standards in Ukraine for the composition of technical documents pertaining to the development of information systems. These specifications are divided into the following sections:

1. **General Requirements.** This section includes the purpose and objectives of development, the intended future functionality, issues, and regulatory compliance.
2. **Functional Requirements.** This section describes the functions to be created and the processes to be automated, user roles, and additional telemedicine operating elements such as directories, status models of entities, etc.
3. **Non-Functional Requirements.** This section defines all requirements related to security, reliability, information protection, standardization, administrative infrastructure, and requirements for testing and acceptance of the functionality by the client after testing and development.
4. **Annexes.** This section outlines the requirements for services, including business process diagrams, and other informational schematics and charts.

In addition, all technical specifications provide a detailed description of how the telemedicine functionality will integrate with the existing components and services of the EHRS central database. It also outlines mechanisms for ensuring interoperability with other medical and information systems operating in Ukraine. This includes recommendations for the use of teleconsultation services and ensuring compatibility with international healthcare systems based on the Fast Healthcare Interoperability Resources (FHIR) standard. The following provides an extended description of the developed specifications, which include technological and functional aspects of telemedicine implementation in various directions:

TELECONSULTATION

The 197-page technical specifications for teleconsultation outlines the business processes of delivering remote medical services for various interaction modalities:

- Patient - doctor (remote consultation initiated by the patient to a family doctor, specialist doctor, or other medical staff),
- Doctor - patient (remote consultation initiated by the doctor to a patient),
- Doctor – doctor (remote consultation initiated by one doctor to another).

These interactions can occur both in real-time or asynchronously, including video calls, text messaging, and virtual exchange of medical documents. As a result of the implementation of the teleconsultation specifications, a comprehensive functionality will be created, which will include the following elements:

- A mechanism for booking times for teleconsultations with doctors, allowing patients and doctors to plan, change, and cancel medical appointments (Appointment).
- A tool for managing doctors' schedules, providing doctors and patients the ability to view available slots and make bookings (Schedule, Slot).
- A system of interaction among consultation participants, which will be used for initiating, tracking, and managing through communication requests (Communication Request).

- A system for creating and processing questionnaires, which will help collect information from patients before and after consultations (Questionnaire and Questionnaire Response).
- A set of dictionaries and directories for standardizing medical terminology and data used in the teleconsultation system (over 20).
- A service for anonymizing patient medical data during teleconsultations with third parties, ensuring the protection of confidential data (Anonymization Service).
- A service for working with a catalog of available medical services, their descriptions, and terms of provision, which will help navigate possible options for providing teleconsultation services (HealthCare Service).
- An expansion of functionality for working with the entity of medical conclusions (Composition), which will also allow creating clinical cases with sets of anonymized electronic medical records (further - EMRs) and forming consultative conclusions based on the results of teleconsultations (Clinical Case and Consultative Conclusion).
- Modifications to EMRs that will allow recording information about conducted teleconsultations in the patient's medical record, including the results of consultations and doctor's recommendations (modification of EMRs).

This functionality will expand the possibilities for providing medical services remotely, which is critically important for patients living in remote or hard-to-reach places, as well as for those with mobility limitations. These developments will also allow for the secure and private recording of provided teleconsultations and assessing their quality at the centralized level of the EHRS central database.

TELEMETRY

In the telemetry (by this term, we mean remote patient monitoring) technical specification (an 80-page document), mechanisms for collecting, storing, processing, and routing diagnostic data for further use and monitoring of human physiological parameters are described. These include devices such as electrocardiographs (ECG), spirometers, dermatoscopes, stethoscopes (phonendoscopes), thermometers, pulse oximeters, glucometers, and other data-transmitting equipment.

It should be noted that teleconsultation and telemetry services are interconnected; teleconsultations are primarily conducted based on diagnostic data that reflect the patient's health status. The telemetry specifications are relevant with functionalities such as the anonymization service, creation and use of clinical cases and consultative conclusions, and communication requests, which are already described in the teleconsultation specifications.

The telemetry specifications detail the data exchange mechanisms and establish requirements for creating a study storage, which is fundamental for integrating telemetry systems/platforms with the central database of the EHRS and Medical Information Systems. As a result of implementing the telemetry specifications, the following new functionalities are planned:

- Recording of human vital sign measurements using diagnostic devices integrated with the central EHRS database (Study).

- Formation of artifacts to confirm the established diagnosis, monitor the progress of the patient's condition, determine baseline indicators and patterns in health status or results of laboratory tests (Observation).
- Creation of artifacts based on the results of the conducted study (Diagnostic Report).
- Processing and storage of diagnostic data with the possibility of their use (Study Storage).

The telemetry functionality will significantly enhance diagnostic accessibility by collecting diagnostic data in real-time, improving the quality and speed of medical service. This functionality is expected to facilitate the equipping of medical facilities with diagnostic equipment and provide patients with the ability to monitor their health status personally, reducing risks in critical conditions and allowing medical professionals to make informed decisions based on current data.

TELERADIOLOGY

In the teleradiology technical specification, which spans 89 pages, the processes of collection, storage, processing, and routing of medical images obtained from teleradiological studies are detailed. These include computed tomography (CT), radiological diagnostics (including mammography), magnetic resonance imaging (MRI), and ultrasound diagnostics (US).

It is noted that teleconsultation services and teleradiology functionalities are interconnected, as doctors during teleconsultations will have remote access to medical images and be able to analyze them. The developed teleradiology specifications include requirements for medical image storage systems, describe the routing of these images, and depersonalized access to them, ensuring security and confidentiality of information.

As a result of implementing the teleradiology specifications, new functional capabilities are planned to be created, which will transform the processes of handling and utilizing medical images. Key functionalities expected in this direction include:

- Recording of study results, which will allow effective integration and processing of medical images in DICOM format, facilitating broader accessibility and interaction with various diagnostic systems (Imaging Study).
- Implementation of a distributed storage system for performed studies (PACS), which will provide rapid access to medical images, significantly enhancing the speed and responsiveness of medical decision-making.
- Implementation of a two-tier DICOM Router service, which will standardize the transmission of images, ensuring security and efficiency of exchange between medical facilities.

These innovations will optimize the use of high-value diagnostic devices, ensure recording and exchange of medical images in DICOM format at the central level, and provide remote access to them. This will improve the speed and accuracy of diagnostics, facilitating a more effective integration of teleradiology into the healthcare system of Ukraine.

CURRENT STATUS

The key technical provisions of the telemedicine specifications were presented and approved at a meeting of the Interagency Working Group on the Development of Telemedicine, with the participation of representatives from both public and private Ukrainian institutions (meeting held on December 15, 2023). The participants positively assessed the proposals for their alignment with strategic goals and healthcare needs, recognizing the technical proposals as suitable for further implementation and important for improving medical services.

The developed technical specifications for teleconsultation, telemetry, and teleradiology were submitted to the SOE "Electronic Health", acting as the administrator and coordinator of the EHRS central database, which is responsible for the development and updating of technical

documentation. The head of the SOE "Electronic Health" confirmed the receipt and compliance of the submitted documentation with the norms for developing technical specifications, existing functionality, and requirements for further processing and development (letter to the LHSS Project dated May 24, 2024).

NEXT STEPS

Based on the completed technical specifications, the next steps include initiating the procurement process for services to develop the specified functionality. The MoH is actively exploring various funding sources to accomplish this, involving government budgets, international aid, and private partnerships.