IT Solutions for better Healthcare

Primary Healthcare Strengthening Project in Georgia

December, 2023

About the Project

Specific Objective:

To improve the quality of primary healthcare service by:

a) Updating and piloting PHC quality management tools;

b) Developing and piloting the Unified Electronic Management Information system, and;

c) Updating qualification standards and requirements of PHC personnel in Georgia.

Indicator 1:

70% of healthcare providers meet the universal standard of healthcare quality by 2023.

Indicator 2:

A standardized Electronic Management Information system introduced by MoIDPLHSA.

Outputs

1. Healthcare quality management (quality assurance and improvement) instruments developed, enhanced and introduced at target locations

2. **Standardized Electronic Management Information System (e–MIS) for Village Doctors and Primary Health Care Centers developed and introduced.**

3. Qualification standards and requirements across the healthcare system updated and career-long learning programs for healthcare professionals have been established.

Definitions of terms for presentation purposes

- **EMR** - electronic medical record system. Incorporates detailed information on the patient's health condition for the doctor to make various medical decisions
- **PHC EMR** - A centralized**, nationwide EMR** for the primary health care sector, which combines digital records from various registers and internal systems of the medical institution
- **Central EMR** - A centralized**, nationwide EMR** for the health care sector, which combines digital records from various registers and internal systems of the medical institution
- **Local EMR** - local EMR working throughout the medical institution;
- **Mobile EMR** - mobile application that helps patients manage their medical history
- **PHC MIS** – Standardized Management Information System created for primary health care facilities. A complex system that also includes **Local EMR**
- **EHR** - electronic medical records system, about a person's health. The system is mainly used for statistical or financial purposes. Does not collect detailed medical records

Definitions of terms for presentation purposes

- **Medical registries** - centralized systems that collect specialized medical information in a standardized form identified by the government, with a predetermined algorithm (immunization, cancer, etc.)
- **Flow sheet** - standard algorithm for managing medical services, which is filled with pre-agreed specialized intuitive mechanisms (for example, for diabetes management
- **Vendor** - an IT company producing electronic system(s)
- **Digital health care** - a combination of all healthcare-related electronic systems across the country
- **Data Exchange Engine** - a unique system that collects and exchanges information with other electronic systems
- **Analytical Engine** - an analytical system that processes the collected data with predetermined mathematical formulas
- **Booking System** - System used for E-Queue Management, Telemedicine, and E-Referral needs

Georgia digital health status

Despite the significant efforts of the state and international partners to develop digital health in the country, many important topics are still missing (before and after the project):

- Georgia Digital health includes dozens of electronic systems, although medical institutions often have to enter the same information in multiple parallel information systems;
- Some primary healthcare institutions do not have any PHC MIS.
- Much of the data is still produced on paper and difficult to analyze;
- There is no central EMR across the country, only the EHR functions;
- A large number of institutions use non-standardized PHC MIS created by different vendors, which is very far from achieving the desired goals of institutions and policymakers;
- Information exchange between systems is complicated;
- Patient queuing/referral mechanism is complicated or almost non-existent;
- Patients do not have practical tools to manage their medical information;

Objectives of the IT component

Despite the small size of the project, the scope of activities was quite large and challenging:
- Developing appropriate systems for the digitization of data in primary health care at the level of medical institutions;
- Development an EMR system to increase the efficiency of patient treatment and information collection from various existing systems;
- Creating indicators and standards for vendors to produce digital data in a uniform format;
- Developing data exchange engines to collect information in a unified data repository;
- Analytical reporting to increase medical quality and monitor state-subsidized programs;
- Providing medical services on a one-stop basis to implement effective referral and telecare mechanisms;
- Increasing the role of citizens to manage medical information;

Project IT-related Results

Caritas
Czech Republic

Assessment tool for Quality of clinical processes of PHC sector	Development PHC MIS
Development of Booking System	Development of PHC EMR
Integration engine(Data Collector) development	Development of COVID-19 Laboratory Management System
Mobile EMR Concept Development	Legislation and other Technical Support

Development of PHC MIS

Capabilities:

- Full digitalization of outpatient medical records at the PHC facility level

- Business process standardization and effective Instruments for better management of health care Institutions

- Data Standardization

- Local EMR production according to the approved state guidelines, standards and regulations

- Improved personal data protection and information security

- Monitoring the quality of PHC services

- Better analytical possibilities

PHC MIS modules & components

- Local EMR
- Inventory management and logistics
- User management
- HR module
- Medical Service catalogue
- Booking, Queue management and referral
- Reception interface
- Doctor interface
- Prescriptions
- Manager interface
- Cash log
- Catalogue of medical services, financing, contracts
- Pay-rolls module
- Analytical module

PHC MIS Implementation and Results of Piloting (Achievement of Output 1.2.)

System was piloted:
- Dusheti Municipality – 16 Village Ambulatories;
- Zugdidi Municipality – 29 Village Ambulatories;
- Five Primary PHC Institutions at Tbilisi and Imereti (among them 4 works in real-time mode)

System rollout support:

- Telephone Communication/Technical Support - 2000
- Online trainings – 174
- Online meetings – 32
- Site visits/trainings – 86
- During technical support completed tasks - 1306

Integration Engine (Data Collector) development

- The objective of the work was to create a specialized data engine for the exchange of large volumes of medical information bilaterally between different actors and systems in the healthcare sector:
- System has two components – 1) Central App located at the Ministry of Health; 2) local APP at Medical Facilities' local servers;
- Unlike classic web services, the local version of the integration engine ensures the smooth operation of the local information systems of medical institutions despite the interruption of the Internet since all validations are in the local version of the App;
- In case of modification of the central part of the App, in line with the new information exchange requirements from the State, the local version of the App automatically requests an update;
- The local application clearly shows the history of data exchange and the results of validation;

Integration Engine (Data Collector) development

- Data is exchanged between the central and local versions only with an Internet connection. In an Internet outage, data is collected in the local version of the App and exchanged when the connection is restored;

- The system provides easy and standardized data exchange throughout various validations;

- The integration engine ensures that a so-called data queue is created for data exchange so that a large amount of data exchange on the central server does not cause various problems for the State;

- The electronic system was initially piloted in five medical institutions to measure the quality of medical care in primary health care. During the COVID-19 pandemic, the system was implemented countrywide and played an important role. Several hundred medical facilities and laboratories sent a few million cases bilaterally.

Integration Engine's data exchange model
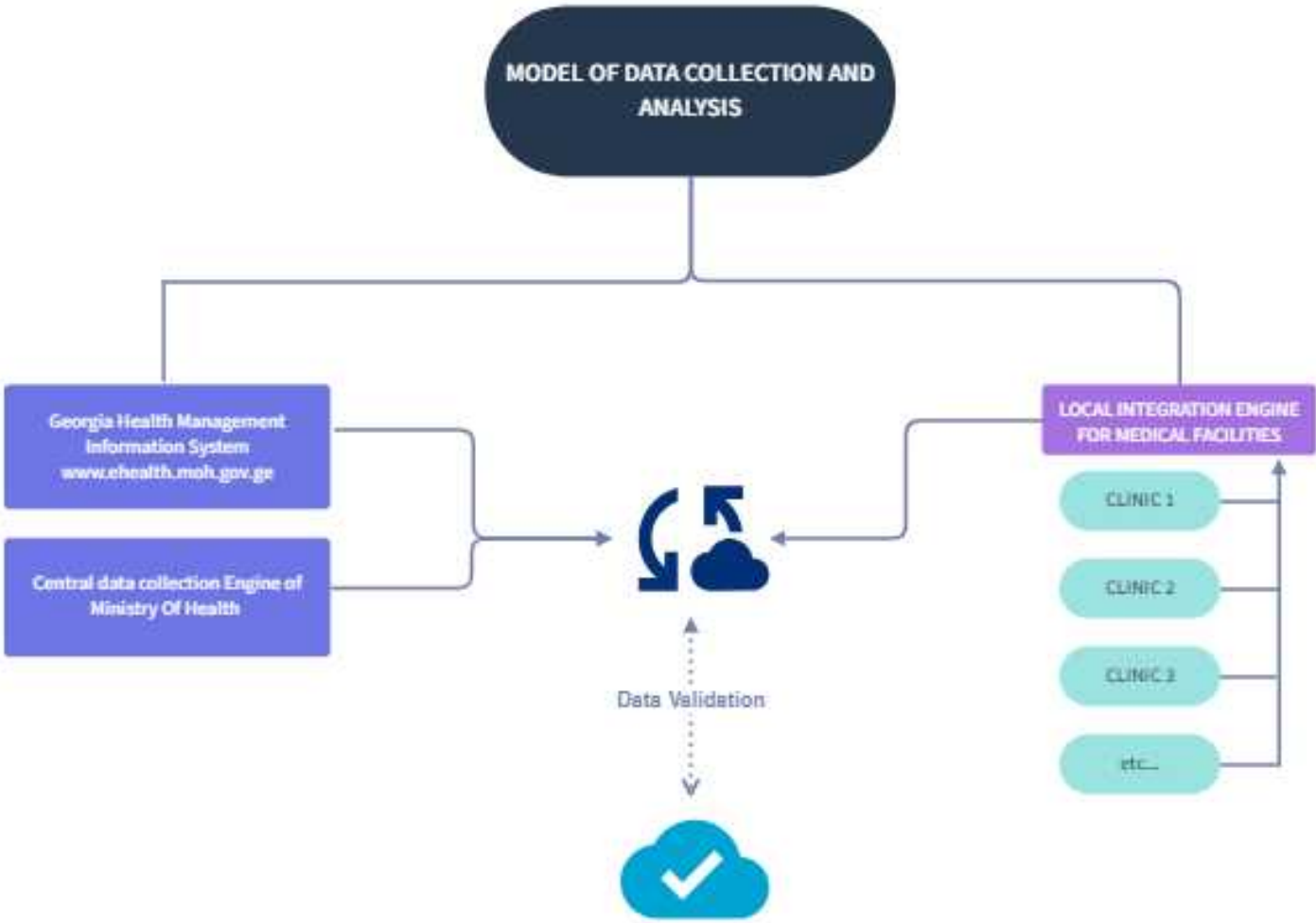
Assessment tool for Quality of clinical processes for PHC

The objective of the work was to improve the quality of PHC services in Georgia and develop a model of quality measurement of PHC services:

- Ensure information exchange between the MIS of five pilot medical facilities developed by different vendors and Georgia digital healthcare;

- Development of a state-centralized analytical system for assessing the quality of medical services and measurement of clinical processes at pilot PHC facilities;

- Development of tools for assessment and Improvement of quality of clinical process at PHC Level;

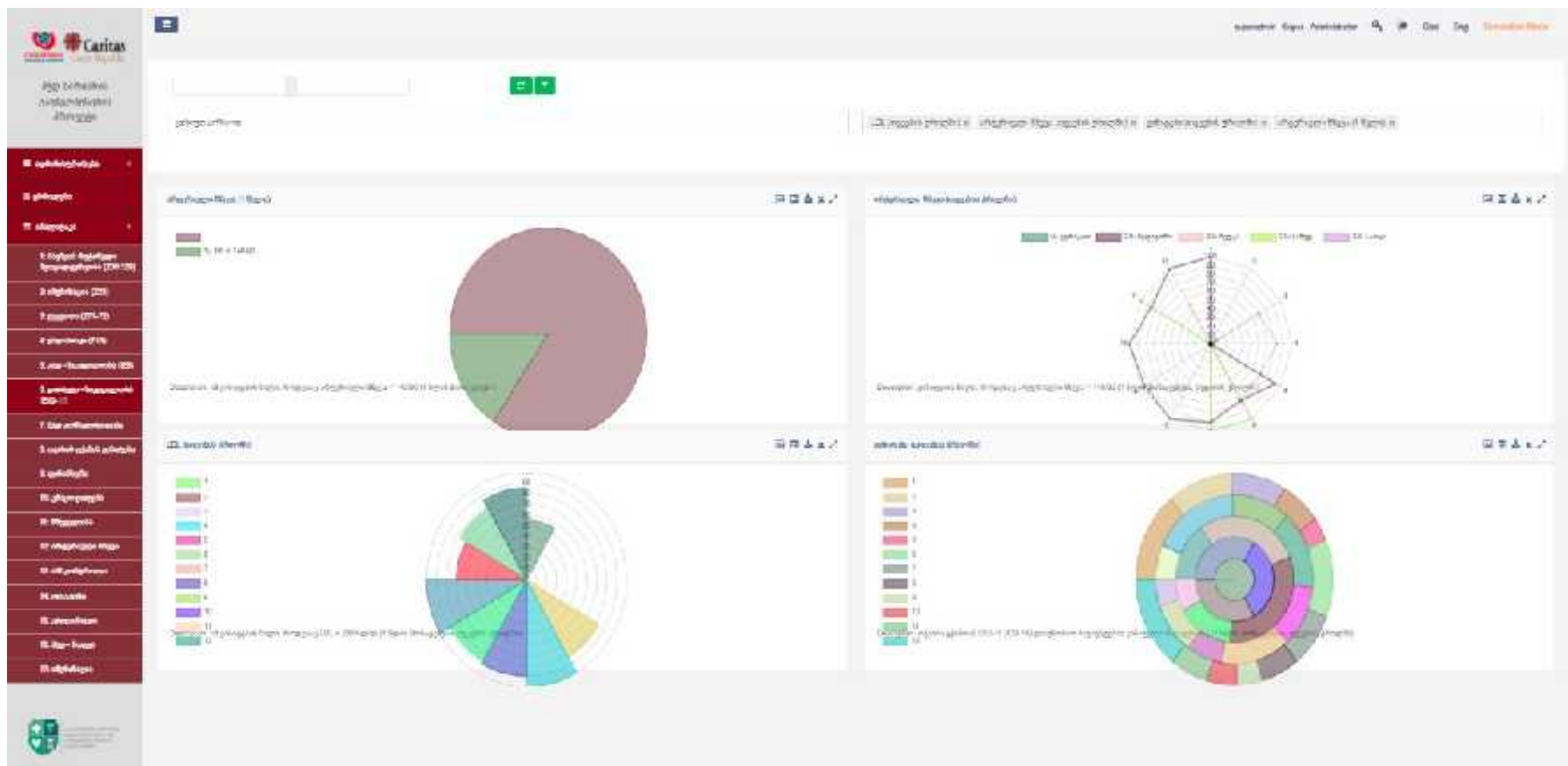# Quality of clinical processes assessment tool for PHC sector

The following reports were placed in the analytic system:

- Immunization coverage
- Assessment of Child Development
- Screening and Control of Blood Pressure
- Glucose screening
- Smoking status assessment and counseling
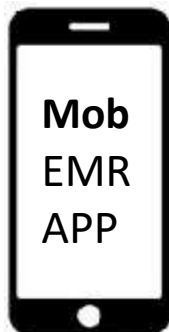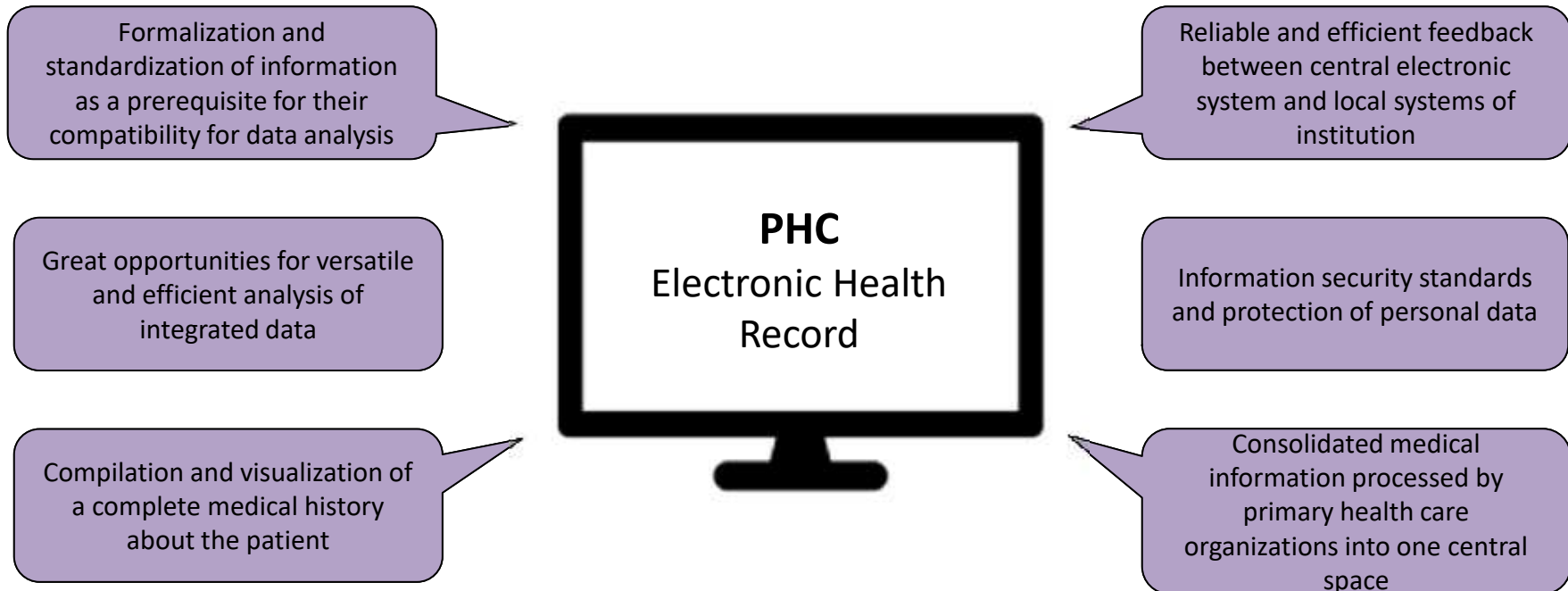- Service utilization and coverage

Quality of clinical processes assessment tool for PHC sector

Analytical Charts

PHC EMR

Caritas Czech Republic

PHC Electronic Health Record

Formalization and standardization of information as a prerequisite for their compatibility for data analysis

Great opportunities for versatile and efficient analysis of integrated data

Compilation and visualization of a complete medical history about the patient

Reliable and efficient feedback between central electronic system and local systems of institution

Information security standards and protection of personal data

Consolidated medical information processed by primary health care organizations into one central space

Mob EMR APP

Complete medical information about the patient outside the medical facility

An effective tool for communication between Central EMR and patient

Ability to view patient prescribed procedures, medication and other medical activities for doctors during home visit

Increased patient access to their medical history

PHC EMR data collection model
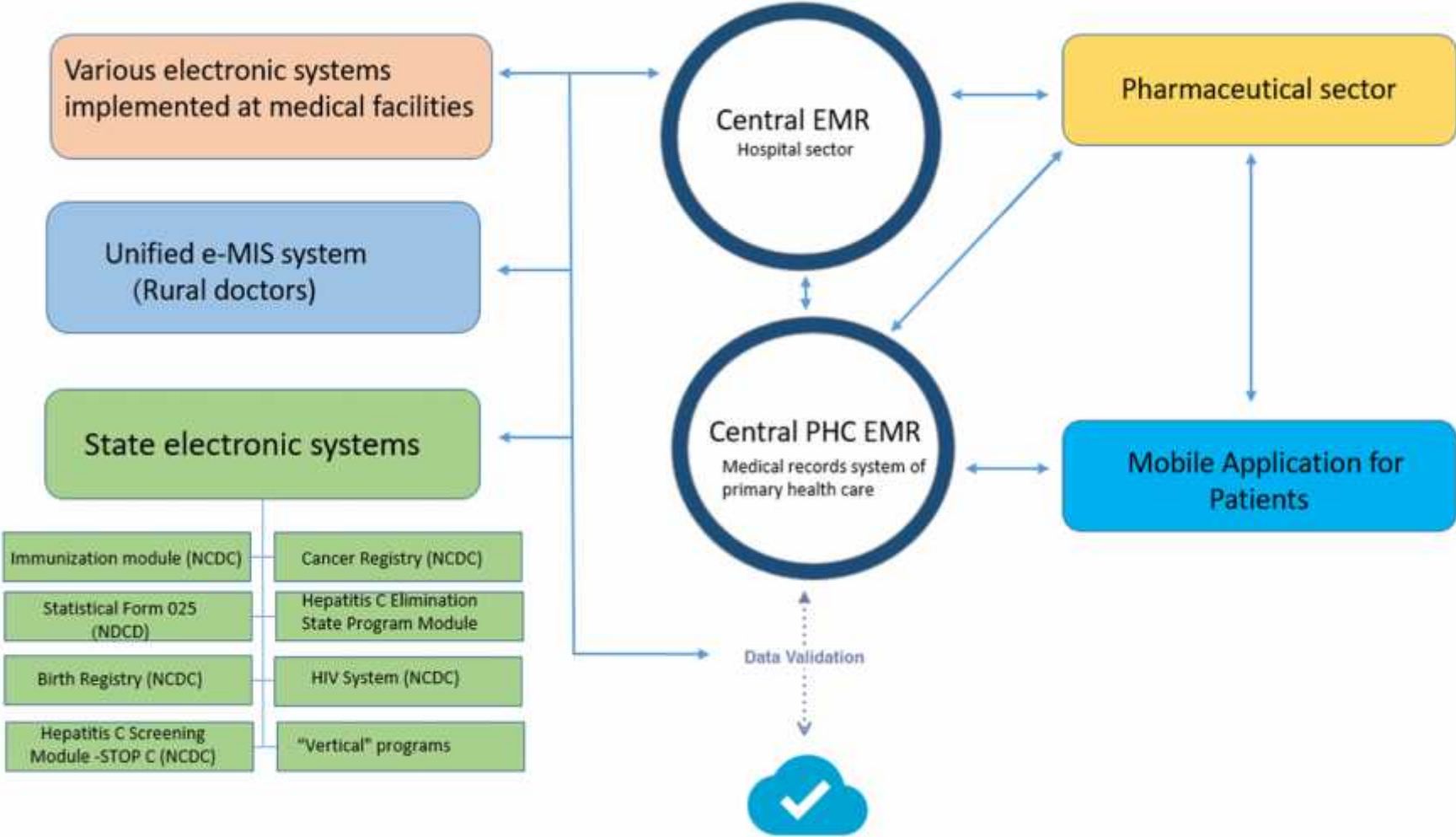
Booking System

Countrywide E-Queue Management, Telemedicine, and E–Referral Management Systems for primary health care (Played a central role in the COVID-19 vaccination process and currently is in the process of being used by other healthcare programs – Cancer Screening and antenatal visits)

1 Convenient tool for booking medical services countrywide from one space

2 Tool for referring Patients to other Medical Facilities

3 Space to organize telemedicine and virtual consultation

4 Data Exchange with Different E Systems

5 Doctors Interface to manage patients flow

6 Integration possibility with local Q Systems and equipment

7 Equipped with Reminder engines

8 Simple in use
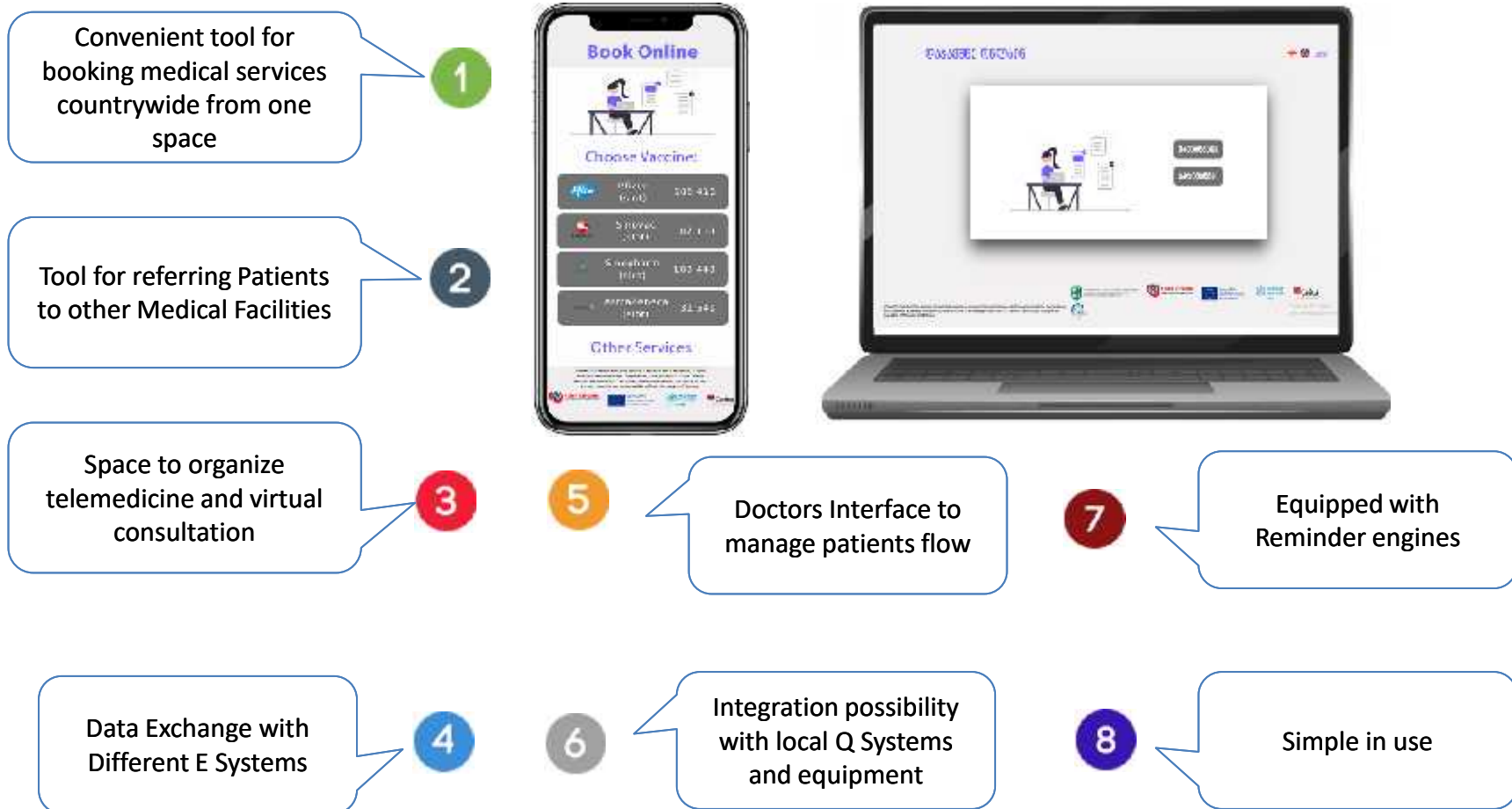
Development of COVID-19 Laboratory Management System

To fight against the COVID-19 pandemic, the „LabCov" system was created within the project, which became the primary tool for the Government of Georgia, the Healthcare sector, and the citizens of Georgia. The "LabCov" system carried out electronic registration of all laboratory tests and their results conducted in Georgia in connection with the diagnosis of COVID-19 disease, in particular:

- Registration of rapid test results (nCoV result / rapid test Covid-19 Ag/antigen, nCoV result / rapid test antibodies);
- Recording data related to blood sampling and transport required for PCR confirmatory tests;
- Electronic registration of the PCR test-related data.
- Information registration about state and commercial tests
- System Linkage with Existing Laboratory Management Information Systems and data exchange
- Development of a Logistical system for sample management, transportation and tracking, and data transfer possibility using barcode readers
- Development of an analytical engine, particularly for LabCov system
- Building and special reporting forms for COVID-19 situation analyses

Development of COVID-19 Laboratory Management System

- 2232 medical institutions and village doctors were involved in LabCov System
- 79 laboratories were involved in LabCov
- More than 18 million data are registered into the system
- The data exchange engine has transferred more than 4 million pieces of data
- The laboratory Covid system processed the cases worth several million GEL
- Various state institutions were involved in the process, and official statistics were produced using the mentioned system
- The system was used for international reporting.

Mobile EMR Concept Development

Within the framework of the project, the concept of the PHC EMR mobile application was prepared.

The existing Georgia E Health mobile application can be used as a basis for creating the system.

The concept document describes:

- Medical data processing issues

- Data Ownership

- App Functions

- App Screens

Mobile EMR Functions

- A tool designed for the patient to ensure a high degree of awareness of his active involvement in the treatment process

- Allows the patient to monitor their medical records

- Allows the patient to manage the status of individual treatment episodes (access / prohibition of relevant data sharing)

- The realized logging functionality fully reflects the processes accessing to the patient's data, which is controlled by the patient through the relevant records.

Legislation and Technical Support

Within the framework of the project, in parallel with the creation of information systems and its various components, the following important issues were created:

- Legislative documentation preparation which aims the complete digitalization of primary care, starting with the implementation of PHC MIS in rural GPs, ending with PHC EMR

- Establishing data collection variables for further consideration to standardize MIS created by different vendors

- Defining the stages of implementation of PHC MIS and PHC EMR

- Informational Technology Agency support to determine the infrastructure resources and topology required for the optimal functioning of the E-Systems

- on-line continuing medical education (CME) courses assembled and uploaded to NCDC's learning platform

Current Status of the systems

The following IT systems were created, tested, and work in a real-time mode:

- E-Management Information System created and works in real-time;
- Integration engine for data exchange between different players and systems created and works in a real-time mode;
- PHC MIS developed, tested and work in real-time mode;
- PHC-MIS, E-Queue, E-Referral, Telemedicine, data exchange engine maintained at 16 Dusheti village facilities, 28 Zugdidi village facilities, and six primary healthcare facilities in Tbilisi, Kutaisi and Mtskheta. Currently, the maintenance and preparation for PHC EMR and Booking Information System testing in the updated test environment has been completed by the Information and Technology Agency (ITA).
- PHC EMR created and tested.

In addition, the PHC MIS in the updated test environment (infrastructure) has been completed by ITA.

MoH is in the process to formalization use the IT products prepared by the project.

Thank you!