ROMANIAN MINISTRY OF HEALTH
Health Sector Reform - Improving Health System Quality and Efficiency Project
Loan no. 8362-RO

TERMS OF REFRENCE
for
eHealth Specialist
for
National Health Data Analytics Master Plan Development
Individual Consultant

1. **Background**

Background on Romania's eHealth Institutional/Policy Framework

The health system in Romania has undergone multiple changes in digital information systems in the last 30 years. Healthcare units are equipped with a range of IT solutions and the necessary communication and information technologies, but despite this, there is an insufficient share of information on patient status and treatment history, caused by lack of standardization and interoperability.

Sharing of information between providers is limited and, in many cases does not take place at all or only for a totally insufficient purpose. Therefore, the issue of managing and exchanging medical information and documents is an important topic for Romania's future eHealth strategy.

Even if there are several developed solutions on the market, for an exchange of medical information systems and regional data exchange, the possibility of interconnecting these systems is limited, and there is no state-guaranteed alternative to ensure an accessible, safe and secure environment for the exchange of medical information.

The role of the Ministry of Health is to implement strategies and policies in the field of health insurance and health reform. The attributions of the Ministry of Health in the field of information system are the organization of health information systems, public health and in the field of data reporting from health units to assess the health of the population, to analyze and periodically evaluate health indicators and performance criteria of medical units. and to make regular reports on the health of the population to the Government. The National Center for Statistics and Informatics in Public Health (CNSISP), a structure subordinated to the National Institute of Public Health, ensures the professional technical coordination and management of the statistics system in the public health statistics and informatics services within the public health directorates and offices. The Public Health Directorates are decentralized units of the Ministry of Health. They organize the activity of collecting, processing and reporting statistical data to the Ministry of Health. Their role is to assess the health status at the local level, the needs of health services, the coverage with resources.

The National Health Insurance House (CNAS) is a public institution of national interest that collaborates with the Ministry of Health for the implementation of its health policies and programs. In the field of information, CNAS ensures the organization and functioning of the unitary and integrated information system for the registration of the insured and the administration of the social health insurance fund. Through its contractual relationship with health service providers, CNAS requests information from service providers being the main repository of information in the health system. The Ministry of Health establishes the reporting

indicators regarding the activity and the state of health based on the proposals from CNAS and the College of Physicians. The National Authority for Quality Management in Health (ANMCS) is a public institution with a role in ensuring and continuously improving the quality of health services and patient safety, by standardizing and evaluating health services and accrediting health units. The evaluation of health services is done by using a dedicated electronic platform. In order to improve the reporting system to international institutions (WHO, OECD, EUROSTAT) and to redesign and streamline the health information system, the National Commission for Supervision of the Health Information System and Reporting to the OECD was set up under ANMCS.

Romania currently has a Health Insurance Information Platform (PIAS) managed by CNAS, which includes: i) the Integrated Single Information System (SIUI), ii) the Electronic Prescription Information System (SIPE), iii) the Electronic Health Insurance Card (CEAS) and iv) the Electronic Health Record (DES).

PIAS is a solution that aims to more efficiently manage the Single National Health Insurance Fund by collecting online and processing in real time all the medical information of citizens receiving medical services. Romania currently has the Romanian Digitization Authority as a technical partner of the European Commission for the information systems component, with synergistic objectives such as, for example, interoperability, but it does not have a specific structure necessary for the coordination of digital health.

Regarding the digital health infrastructure, 97% of the Romanian family doctors' offices use a computer during a medical consultation. Of these, 65% of family physicians store the patient's medical record electronically. The individual electronic transfer of patient data is not yet on the agenda of Romanian family doctors. There is no standard format used by all family physicians for the patient's medical record. 16% of Romanian offices exchange medical data with other specialties and hospitals and only 2% of offices transfer administrative data on the patient for reimbursement through computer networks.

Regarding the national strategic documents, the National Health Strategy 2014-2020, proposed the realization, in the short and medium term, of an Integrated Health Information System (SIIS) which failed. This document proposed action in seven areas of intervention for cooperation and coordination of ICT (information technologies and communication) services at national level:
1. Redesign of the health information system,
2. Harmonization of the legislative framework with the extended use of ICT,
3. Creation of a common IT structure,
4. Creation of a common technical infrastructure,
5. Facilitation of interoperable systems ICT,
6. Facilitating access to information beyond institutional borders,
7. Information and services accessible to citizens.

Among the initiatives proposed for the implementation of the previous strategy were the establishment of a single central body responsible for the field of health informatics and especially for the standardization of IT in health. This structure within the Ministry of Health should have dealt with the development and maintenance of mandatory national eHealth standards and the administration of SIIS.

Within the National Strategy on the Digital Agenda for Romania 2020 within the field of action 2 - ICT in Education, Health and Culture, strategic development lines for ICT in Health were provided as follows:

- Ensuring the interoperability of medical information systems and cyber security, both between entities included in the system as well as on the interaction of the system with the patient,
- Ensuring Big Data systems for the efficient management of the information generated by the implemented computer system,
- Collaboration between government institutions,
- Corroboration of data, provision, management and organization of services on diagnosis, treatment, care, rehabilitation and health promotion,
- Standardization in accordance with EU Directives of all medical acts in order to support interoperability of the medical system,
- Efficient management of information generated by the IT system.

The project "Establishing the framework for the development of e-government tools (EGOV)" SIPOCA 20, implemented by the Romanian Digitization Authority (ADR) in partnership with the General Secretariat of the Government (SGG), with the support of consultant Ernst & Young (published in July 2020), defined a set of Measures for the development of e-government in Romania. Measure 8 aims at "Development of critical IT systems as well as other IT systems associated with key areas or sectors of public intervention", as follows:
1. Development of CNAS Information System
2. Creation of the National Observatory for Health Data,
3. Development of digital solutions in health infrastructure (internal and external digitization of medical institutions),
4. Standardization of information flows (software upgrade, development of computer systems / equipment acquisition),
5. Operationalization of the eHealth Agency.
6. The initiative will also consider the creation of the eHealth services hub, development of new eHealth services, development of the Registry of Health Registers.

In November 2020, Ministry of Health announced the development of a proposed eHealth Strategy, not approved and implemented to date. Among the strategic objectives of the eHealth Strategy, Strategic Objective 1 refers to the Development of infrastructure and the optimization of digital health management in Romania, which includes the establishment of the National Agency for Digital Health (eHealth). The National Health Data Observatory will be organized within the Agency, which will serve as a database to collect and aggregate health data in order to develop public policies in the field. The Observatory will adopt those cost effective and secure technical solutions for the realization of an information system capable of generating the statistics and analyzes necessary for the Ministry of Health. Its development as a common informational and technical structure will technically involve a decision support system where all data from the IT system is collected in order to serve as a support for the decision-making process. The Observatory will centralize and capitalize on the data from the National Health Registers. The Agency, through the National Data Observatory, will also regulate the secondary use of health data outside the health sector for purposes that could provide a perspective on decision-making. Indicators include:
1. Establishment of the Digital Health Agency,
2. Number of IT devices at medical service providers in Romania,
3. Number of medical service providers connected to the interoperability network of the Digital Health Agency,
4. Number of partnerships with international authorities with roles in developing the field of eHealth.

Strategic Objective 3 focusses on increasing the effectiveness of the health system, with three specific objectives:

A. data exchange:
    a. allowing secure sharing of healthcare information with the patient,
    b. sharing between health care providers,
B. communication and system effectiveness and patient care
    a. evaluation of the effectiveness and quality of treatment by national comparison with the international one,
    b. creation of a system and tools for monitoring healthcare costs,
    c. creation of a dynamic tool to evaluate the effectiveness of the healthcare system
C. elimination of administrative burdens and barriers.

Program-for-Results's Objectives on eHealth

Under the Romania Health Program-for-Results, improvements in health information management are envisioned to ensure standardization, and interoperability of the existing subsystems, to facilitate access to information and enable evidence-based decision-making, including commitment controls. The application of state-of-the-art data analytics will help identify and prevent inefficient spending in many areas—for example, unnecessary care (referrals, visits, laboratory tests, etc.), failure to adhere to best practices, duplication of services, non-optimized drug prescriptions (e.g., less use of generics than expected), non-optimal use of infrastructure and medical equipment, low workforce productivity, detectable high-cost centers (e.g., population with high number of readmissions, over-prescribing centers), errors (e.g., coding, claimed services not connectable to medical conditions), and frauds.

Lack of centralized data exchange platforms and mechanisms for accountability in the use of health financing lead to inefficiencies in health spending. The National Health Insurance House data system, which captures 67 percent of total health expenditure, has limited mechanisms to identify and prevent the provision of unnecessary services or detect errors in claims and fraud. The disconnect between the National Health Insurance House data system and the Ministry of Health (including services provided through community health care and the national health programs on prevention) also prevents the review of health expenditure and utilization patterns across the whole system. Lack of a data governance standardization platform limits communication between systems and prevents the introduction of quality assurance mechanisms to hold providers accountable for performance. This will support the development of data governance framework and building IT systems that enable the identification and reduction of ineffective health expenditures and promote performance management in service provision. It will also improve epidemiological surveillance, detecting changes in incidence, mortality, and the geographic ranges of health outcomes.

An inter-institutional agreement for data governance will be developed and implemented, strengthening the stewardship role of the Ministry of Health in overseeing the efficient, reliable, complete, and timely collection and reporting of data for decision-making via centralized platforms. The National Health Insurance House will develop and implement adaptive algorithms for service delivery reporting from health care providers and improve detection of unnecessary service provision, errors in claims, and fraud. An interoperable system will also be developed to connect data from the National Health Insurance House, Ministry of Health and providers, enabling the application of advanced algorithms to further identify and reduce inefficient spending. Reducing losses due to inefficient spending will reduce projected total health expenditure by the National Health Insurance House by 2.5 percent. Technical assistance will be required to design and implement an upgraded system platform for the interoperable data system.

2. Purpose of the Assignment

The purpose of the assignment is to support efforts to build IT systems that will enable improved legal, financial, organizational and data analytics capacity to improve policy decisions for identifying and reducing inefficient health expenditure and promoting performance management in service provision. To do that, the Ministry of Health is looking for development of a **Health Data Analytics Master Plan[1].** It aims at increasing the stewardship role of the Ministry of Health in overseeing the efficient, reliable, complete, and timely collection and reporting of data for decision-making via centralized systems.

The Master plan will be a stakeholders' agreement in the form of a policy paper that will define as a minimum:

    (i)   a single vision of data domain in health, including consolidation and coordination of current systems and projects already underway at National Health Insurance House and Ministry of Health,

    (ii)   overall future architecture of health data management and eHealth systems interaction,

    (iii)   institutional arrangements on improved health data governance and responsibilities for the implementation of the Master Plan, and

    (iv)   action plan, including sources of investments and sustainable systems' development and maintenance.

The Master Plan provides the roadmap to ensure availability of data sets that will allow application of advanced methodology and algorithms for identifying inefficient spending by using data analytics and cross-check on the connected data among National Health Insurance House, Ministry of Health and providers.

The Master Plan will be an agreement on how to build an inter-operable system that connects data among National Health Insurance House, Ministry of Health, and providers (based on Government Cloud support) to allow:

- integration of data from key central systems (expanded national EHR, key registries such as HR registry, National Health Insurance House core systems, ePrescription, eReferrals), providers' systems (PHC, hospitals, pharmacies, laboratories) and community care information system;
- interaction between the systems based on interoperability standards, and data and registers models according to the EU recommendations;
- implementation of an integrated Health Management Information System (HMIS) as a Business Intelligence (BI) and data analytics tool that allows consolidation of administrative and financial data, implements data cross-checks and smart analytics aimed at reducing losses caused by inefficient spending and provides analytical reporting on healthcare system resources (human resources, facilities, etc.) and key performance indicators (KPIs).
- implementation of the National Health Data Observatory as a data warehouse and data reporting/analytics tool that identifies health data consumers, data sets and data sources, consolidates public health data sets and registries, provides key national healthcare system indicators, including key national reporting indicators to EU and WHO.

---

[1] The Project Appraisal Document refers to the plan as "Health Data Management Strategy". After initial consultations it was agreed to use the term "Health Data Analytics Master Plan" to avoid confusion with the "National Electronic Health Strategy". The national Strategy is the document that aims at the overall electronic health improvements while the Health Data Analytics Master Plan aims more specifically at better health data governance/management and their use for analytics.

The Ministry of Health, National Health Insurance House and IPH will use improved methodology and algorithms to utilize new tools and information available, including blended methods of monitoring and evaluation (automatic with the combination of manual/classic audit), improvements of the definition of data sets to be provided by providers, legal consolidation of data on healthcare systems resources, etc. to improve legal, financial, organizational and data analytics capacity to make better policies and decisions, thus increasing the efficiency of the healthcare system by avoiding unnecessary National Health Insurance House expenditures.

The Health Data Analytics Master Plan will be developed through a participative process that will involve stakeholders related to key healthcare data sources, as well as those in need for healthcare data analytics. It will involve strong coordination with all the existing digital health strategy and transformation programs. The process will be enriched and facilitated by bringing in the international electronic health (eHealth) expertise and experience, but critical success factor will be discussions and consensus between stakeholders on realistic options for the sustainable health data analytics operational model and design.

Key activities and processes that will lead to the development of the Health Data Analytics Master Plan will include:

 1) a quick institutional review of the health system with emphasis on information governance/management,

2) a needs assessment for health care analytics and business intelligence,

3) stakeholder consultations and discussions

4) the development of a draft master plan for discussion and input, and

5) the production of a final master plan and technical support to the process of its adoption.

The Ministry of Health is looking for an individual consultant to help in needs assessment, to design of the health data analytics technical architecture and help in drafting of the Health Data Analytics Master Plan.

2. Objectives of the Assignment

The Consultant`s assignment has two objectives:
   a) to perform the review of the healthcare information systems with the emphasis on data availability and potential for exchange. The purpose of the review would be to develop recommendations, functional and technical requirements for improved health data analytics.

   b) to contribute to drafting of the Health Data Analytics Master Plan that will be a policy document on improved data governance framework and institutional, organizational and technical design of data management systems for collecting, managing and providing information from the health sector to stakeholders.

3. Scope of Work

To achieve objectives, the Consultant will carry on the following **tasks**:

A. Assessment and recommendations.

- Identify key information systems, data sets and data exchange capabilities in Romania health system (PHC, hospitals, CNAS, public health, pharmaceutical sector, community healthcare, quality management, governance, etc.). Perform the review of information management arrangements related to services/programs, on institutional, operational and technical levels, including quick assessment of existing computerized information systems, services and tools (key processes for data management and usage, system architectures, database architectures, key relevant data sets, data exchange capabilities, GeoSpacial tools, system platform).

- Assess the need for overall re-design of healthcare data analytics and business intelligence operational and technical model in the Romanian health system.

- Assess the plans and status of the development of the Romanian Digital Health Unified Platform for Health Information Exchange to understand the architectural options for integrated data management to fulfill the health data analytics needs.

- Improve capacity of policy makers and stakeholders in healthcare data analytics by providing:
    - International experience and examples of technical solutions for healthcare data analytics, including
    - Written information and links/access to on-line resources on eHealth tools and systems for data exchange and analytics;

- Based on results of assessments, discussions with stakeholders, and relevant international experience, assess the options and provide initial recommendations for architectural and technical redesign of healthcare data analytics, based on digital health transformation programs, to move from static, fragmented and non-complete data sets/databases to rapid, reliable and dynamic data processing, exchange, extraction and consolidation

- Recommendations for further planning of the overall eHealth Strategy in order to provide appropriate digital health environment required for improved health data analytics.

B. Drafting the Health Data Analytics Master Plan

1. Advise on (i) purpose, (ii) scope, (iii) institutional and legal changes, and (iv) road-map to implement new data analytics and business intelligence operational model in Romania health system to support the development of data governance framework and building IT systems that enable the identification and reduction of ineffective health expenditures and promote performance management in service provision. Participate in drafting the Health Data Analytics Master Plan by providing inputs for:

   a) Establishing dynamic, adaptable and sustainable system of maintaining the health data analytics objects (metadata and catalogs, analytical data sets, indicators and reports), including initial content of analytical data sets and catalog of indicators and reports.

   b) Conceptual design of the Romania health data analytics systems, data exchange, data security/privacy and technical environment and infrastructure.

   c) Improvements of the overall eHealth standardization framework required for health data analytics to function effectively and efficiently, aligned with the Romania eHealth strategic plans.

d) Logical and technical health data analytics architecture, central systems and services that will allow data exchange based on Romania eHealth strategic plans, interoperability standards and use of common reference registries.

e) Improvements of the eHealth standardization framework required for health data analytics to function effectively and efficiently, aligned with the Romania eHealth Strategy.

f) Logical and technical health data analytics architecture, central systems and services that will allow data exchange based on interoperability standards and use of common reference registries.

g) Functional and technical requirements for key technical systems and services that will provide interoperable system to connect data from the CNAS, Ministry of Health and providers, enabling the application of advanced algorithms to identify and reduce inefficient spending.

h) Estimate and specify needs for long term health data analytics infrastructure/systems maintenance, including the estimate of recurrent costs.

i) Recommendations on Romania health data analytics roadmap and implementation strategies, including phasing of investments, indicators of progress and monitoring mechanisms.

2. Facilitate the discussion between policy makers and stakeholders on draft Health Data Analytics Master Plan to reach the consensus on approach, solutions and implementation strategy.

3. Based on discussions, participate in finalizing the Health Data Analytics Master Plan and provide technical support to the process of formal Master Plan adoption.

4. Deliverables

The Consultant will deliver the following:

No.	Reports	Delivery time
1.	Report covering tasks A.	**4** months after the day of commencement of the service.
2.	Draft Health Data Analytics Master Plan (B.1)	**6** months after the day of commencement of the service.
3.	Final Health Data Analytics Master Plan based on work under B.2 and B.3	**11** months after the day of commencement of the service.
4.	Final report	**12** months after the day of commencement of the service.

5. Working Arrangements and Reporting

The Consultant will work with the Ministry of Health, the National Health Insurance House expert team and other relevant Romanian authorities to jointly develop integrated Health Data

Analytics Master Plan. The Ministry of Health will establish the Technical Working Group (TWG) consisting of representatives of all stakeholders to work with the Consultant. The Consultant will also cooperate with the World Bank support team.

The Consultant will work closely with a Healthcare Information Management Policy Specialist at the Ministry of Health who will be more focused on policy requirements aspects of the Master Plan.

The consultant will work closely with a Health Data Policy Specialist who will be more focused on policy and business requirements aspects of the Master Plan, including trough making joint visits to Romania.

The Consultant will report to Secretary of State in the Ministry of Health and will keep informed the World Bank Technical Lead. The Program for Results Coordinator will facilitate consultant`s communication with government counterparts in Romania as needed. Moreover, the Program for Results Coordinator will provide the consultant with all relevant information/documents/reports produced by/in cooperation with the World Bank that are relevant for this assignment.

6. Required Qualifications

- graduate degree in Information systems; post-graduate degree will be advantage;
- At least 10-year experience in the field of information technologies;
- at least 5 years of experience in e-Health systems development, design and implementation;
- at least 5 years of practical experience in e-health data analytics systems development, design and implementation;
- Experience in development and implementation of the technical architecture of unified healthcare integrated information systems with accurate records of implementation experience and active knowledge of the fundamental architectural structures and methodologies;
- Minimum 5 years' experience in functional analysis of complex technological applications for large-scale systems, and business process reengineering;
- Experience in working with complex applications in variety of architectural environment;
- Good knowledge of service-oriented architecture services (SOA), event-driven architecture, Web services and other integration techniques;
- Good knowledge on data warehouse and business intelligence systems;
- Good knowledge of a unified language (Unified Modeling Language), the business process model and notation (BPMN);
- Experience in business analytics and implementation of ICT based solutions for the public sector;
- Experience in carrying out functional review/systems analysis;
- Experience in developing requirements for healthcare information systems (at least one reference provided);
- Proven record of writing analytical and technical reports;
- Fluency in English; fluency in Romanian would be an advantage;

The Consultant may be an authorized legal person (PFA) or an employee of a company with the possibility of invoicing his/her services. All taxes that must be paid in relation with the future contract, arising from these services, will be paid by the Consultant and/or his/her employer.

Special requirement: confidentiality and absence of conflict of interests under the contract.

VI. DURATION OF ASSIGNMENT, WORKING CONDITIONS AND LOCATION

The duration of the assignment is of 12 months period from the contract signing date. The estimated time input for the Consultant to fulfill the purpose and objectives of the assignment is of 80 working days.

The Consultant is free to establish his / her work schedule, but in order to ensure an effective and efficient communication and collaboration with the PMU staff, MoH representatives, consultants and others will organize his / her work so that he / she is available to respond during the PMU work schedule, respectively from Monday to Friday, in the following time interval: Monday-Thursday from 08:30 to 17:00; Friday from 08:30 to 14:30, until the end of the assignment.

The consultant would occasionally travel according to project's specific implementation requirements.

****

Any changes and additions to the present Terms of Reference shall be introduced upon consultation with the Project Coordinator and with the approval of Minister/State Secretary of Health and the World Bank.