

Terms of Reference

PBF Web-Based Application and Dashboard

1. Background

The Government of Liberia (GoL) has received funding from the World Bank to support the implementation of the Institutional Foundation to Improve Services for Health (IFISH) project. The total project financing is US\$85M (US\$74M from IDA and US\$11M from the Global Financing Facility (GFF)) and is expected to close in August 2026. The project's development objective is to improve health service delivery to women, children, and adolescents in Liberia. The project is structured into four (4) components and thirteen subcomponents. The four main components are: Component 1: Improve Health Infrastructure; Component 2: Improve Service Delivery; Component 3: Strategic Purchasing and Equity in Health Financing; Component 4 Project Management and Monitoring & Evaluation; and Component 5: Contingency Emergency Response.

Subcomponent 3.1. will support the implementation of performance-based financing (PBF) at County Health Team (CHT) level, hospitals and clinics with a focus on RMNCAH-N services. The PBF will be scaled-up from three to six counties, and in Montserrado County, PBF will only be implemented at the Old Redemption Hospital. In line with the PBF harmonization process, PBF activities such as contracting, results verification, invoicing and incentive payment, distribution, and use of PBF funds as well as implementation monitoring will be carried out in adherence to the national PBF manual.

Currently, the Ministry of Health uses the excel based solution as the main instrument to manage, analyze data and process PBF invoices. Excel have been the main software that has been used in the last five (5) years that the World Bank has been supporting the MoH to implement PBF in Liberia. The Ministry of Health seeks to develop and implement a PBF Application that is interoperable to the existing DHIS-2 system and other applications in the Ministry of Health's digital enterprise architecture.

The IFISH project under the component 3 “Strategic purchasing and equity in health financing” and subcomponent “*Expansion of PBF coverage*” will support the hiring of a consultant to develop a web-based application to handle PBF Analytics and link it to DHIS2. The web-based application will allow the collection of assessment data at participating CHTs, Hospitals and Clinics for the PBF program and directly “link” them with the DHIS-2 system and automatically generate the individual and/or consolidated invoices per implementing entities for payments. The MoH under this project will be disbursing performance incentives on a quarterly basis throughout the project life and thereafter this period the GoL will take over.

Under the PBF subcomponent, the Ministry of Health plans to conduct quarterly quality assessments and verifications at service delivery level in retrospective manner. The system is planned to be mainstreamed in the Ministry of Health PBF Program and Health Information Management Systems and will be substantially IT-reliant. It will accelerate the need to digitalize all data management, thus reducing insistences of paper-based and excel-based activities in all interventions, at peripheral and central level. Furthermore, costs related to the app development and production of these dashboards to visualize performance on the PBF indicators will be supported by the IFISH project.

2. Main Objective of the Consultancy

The objective of the consultancy is to support the Ministry of Health to develop and maintain an electronic system for collecting, verifying, analyzing and visualizing selected indicators on quality and quantity of health care service delivery (outputs) at health facilities and Local Governments linked to the DHIS-2 and facilitate invoicing. This is expected to improve efficiency in the verification, invoicing, transmission of invoices and payment of PBF grants.

2.1 Specific Objectives of the Consultancy

- i. Develop mobile data collection tools which can be utilized offline but that are able to automatically upload data to a specified server upon encountering an internet connection using an output format that is compatible to the DHIS-2. These will be data collection and verification tools for quality and quantity outputs at CHTs, hospitals and clinics;
- ii. Automate the invoicing system for agreed outputs at CHTs, hospitals and clinics using a module that is linked to the DHIS-2. The system should allow for the preparation and printing of facility-specific and consolidated invoices at county and national levels; and
- iii. Support budget tracking and visualization of payments at health facilities and enable printing of invoices for health facilities enrolled onto the PBF. The system should also allow electronic visualization of data at each health facility and county, and aggregation at national level.

3. Scope of Work

The consultant is expected to: (i) Develop a web-based data information system to support PBF verification and invoicing, (ii) Digitalize the data collection tools and data transmission process, and (iii) Connect the PBF data system to the national DHIS-2.

3.1 Development a web-based data information system to support the PBF verification and invoicing

The consultant is expected to develop a web based PBF data consolidation and management system that will be used to collect routine data on specified quantity and quality indicators from CHTs, hospitals and clinics. The system is expected to have the following features:

- (i) A back-end management interface with the following features:
 - A module for capturing data from quantity and quality assessments
 - The possibility to add, delete and modify health indicators and health facilities. The system should capture at-least the following: name of the health facility, the health district and county, the health facility code; location of the health facility including geo-codes, text, photos, and multimedia.
 - A report module with the following reports: (a) quarterly health facility performance report and invoice, (b) quarterly consolidated report and invoice, (c) a consolidated invoice
 - A module that allows to download all the data in Excel format
 - A security module, which allows access to the database and perform modifications with varying levels of admin system user and administrator authorization

- (ii) A public interface that allows display of outputs by health facility, health district, county, and national level and by indicator. The web-based interface should be built on top of DHIS-2 and should make the underlying health facility registry in DHIS-2 openly accessible on the web
- (iii) Advice on hosting the database, server specificity, networking, and data security requirements
- (iv) Develop a comprehensive Implementation Plan outlining the key steps in developing and rolling-out the system. This will include: presentation of the application to the project implementation unit, testing, hosting plan, database and website management, training/capacity building, and web-application maintenance and support
- (v) Develop "user-friendly" user manuals for central and county level implementers describing the different features of the software and day-to-day use of the system. The user manuals will include (a) standard user procedures which focuses on the new application, and (b) highlighting the interoperability with DHIS-2 interface
- (vi) Pursuant to the training, identify the various types of admin system users (i.e. super-users, national administrators, county managers, facility administrators, etc) and provide them with respective admin rights
- (vii) Maintain the application through a 12 months' handhold support
- (viii) Provide training to key staff at the central Ministry of Health, county, and facility levels. All people who will be involved in data capture and analysis, and in the management of the system must be trained.
- (ix) Ensure knowledge and skills transfer by conducting trainings for developers working at the Ministry of Health to ensure ownership and sustainability beyond the 12-month support period. The training will focus on the understanding of the architecture and utilization of the system. The consultant should ensure that the local web programmers who are trained are able to maintain the system when he/she hands it over

3.2 Digitalization of the data collection tools and data transmission process

To minimize workload and improve the efficiency envisaged in the web-based system, the consultant is expected to customize the existing tools that are being used to collect and verify PBF data. Once data is uploaded into the web-based system, the associated unit costs will be calculated automatically, and invoices generated. The consultant is expected to provide mobile applications that will be used by health providers and the PBF Unit. The applications shall be connected to the DHIS-2 platform, meaning that the granular quantity data on selected indicators will be available automatically in the national DHIS-2 platform. The system will also be connected to automated computations of quality-of-care scores so that the final payments captures both quantity and quality aspects. The data collected by this application will be managed by the PBF Unit supported by the Health Information Division of the Ministry of Health. The mobile data collection application's features will include but are not limited to:

- (i) Provide a sustainable application (preferably open source: Web based dashboard, Desktop, Mobile and tablet based)
- (ii) The data verified by mobile devices can be processed offline but once a network connection is available, the data should be transmitted to the PBF database
- (iii) The PBF Unit should be able to easily modify data collected through the mobile devices
- (iv) A dashboard should allow the program manager at the national level to continuously monitor the mobile data collection, detect errors, manage duplications.

3.3 Connect the PBF data system to the national DHIS-2

The system must be interoperable to the DHIS-2. As a result of this interoperability, the PBF data, invoices, and other relevant health facility data (facility-type, geo-code) will automatically be shared with the DHIS-2 platform. This will require alignment of the health facility registers/electronic patient records.

4. Reporting

The consultant tasks will be supervised by the HIS Unit Director and the PIU within the MoH. The Consultant will be required to submit Deliverables achieved on a timely basis as agreed. All Deliverables will be discussed and agreed with the PBF Unit, following which the Invoice for Deliverables achieved shall be signed and sent to the PIU Manager for authorization of payment.

5. Deliverables and Payment Schedule

Deliverable	Timeline	Payment schedule
Deliverable 1: An inception report highlighting how the work will be delivered. The inception report must include a comprehensive implementation plan outlining planned activities the development and roll-out of the system, capacity building, maintenance, and support	%
Deliverable 2: Functioning Integrated Software application including supported devices	%
Deliverable 3: Developer and User manuals	%
Deliverable 4: Consolidated report on the PBF web-based application. The report must include information on: (i) the number and outcome of the end-users and local web developers trained, (ii) system maintenance, and (iii) technical support.	%

The timelines and payment schedule be agreed upon during negotiations and documented in the contract.

6. Qualification and Experience

The support will be provided by an individual consultant with a strong track record in the following fields:

- (i) BSc in Information Technology Management, Computer Science, Software Development or related field. An advanced degree in these fields will be an added advantage
- (ii) Experience in the development of PBF data systems; and knowledge and skills in DHIS-2 and its interoperability with other data systems especially with regards to PBF web-based applications
- (iii) Experience in developing web-based/tablet applications for remote data collection for both online and offline mode e.g. ODK or KoboCollect
- (iv) Experience in coding with mobile phone/smart phones
- (v) Experience in designing dashboard system for data visualization and report engine adaptation.
- (vi) Experience in using open-source infrastructure to host the system. Experience in using R or Python in developing similar applications should be an added advantage

7. Duration

The assignment is for a period of 12 months from the date of signing the contract. This will include development and maintenance of the database, training and mentoring of staff from the Ministry of Health.