TERMS OF REFERENCE FOR INDIVIDUAL CONSULTANTS

Title: Consultancy: Design Implementation Framework for Medical Oxygen Demand Forecasting, Logistics Management Information System and Establishment of a Hub -and- Spoke Supply Model to Health Facilities	**Funding Code:**	**Type of Engagement** ☒ Consultant (National) ☐ Consultant (International)	**Duty Station:** Freetown

Background:

The supply of medical oxygen is crucial for healthcare delivery, a need that became especially evident during the COVID-19 pandemic when significant gaps in availability were observed in the country. At the onset of the pandemic, the country had only two operational oxygen plants, located at Connaught Hospital in Freetown and Koidu Hospital in Kono District. However, the output from these two plants was grossly inadequate to meet the demand for high-flow oxygen of hospitals nationwide. To address the challenges faced, the country developed a comprehensive oxygen strategy providing a framework to ensure the availability, accessibility, and effective use of medical oxygen. The goal of the strategy is to ensure that all patients who need oxygen therapy can access it promptly and safely, thereby improving health outcomes, especially in critical conditions such as respiratory illnesses, surgical recovery, delivery and post-delivery and newborn care and emergency care.

With support from the UK Foreign, Commonwealth & Development Office (FCDO) and the Islamic Development Bank (IsDB), the Ministry of Health (MoH) procured three PSA oxygen plants, which have been installed and commissioned at hospitals in Bo, Makeni, and Kenema. Additionally, seven more plants, funded by the Global Fund and UNICEF's ACT-A Supplies Financing Facility, are expected to be installed and commissioned at seven more hospitals by the end of 2024. 64 Oxygen concentrators have also been procured and distributed to selected health facilities to supplement the supply from PSA plants. However, the actual demand for oxygen across health facilities in the country remains unclear, and there is no established framework for forecasting demand during both routine and emergency situations to assist in the planning and distribution of this essential resource. Moreover, in response to the increasing demand for medical oxygen in healthcare facilities, there is a critical need to ensure efficient and reliable oxygen supply. This requires a well-designed distribution model that addresses the geographical and logistical challenges. The hub-and-spoke model has been identified as a potential solution to streamline the supply chain and optimize oxygen distribution.

In this context, the Ministry of Health, supported by funding from the Global Fund CR19RM, seeks to engage a consultant to design an implementation framework for medical oxygen demand forecasting, develop a logistics management information system, and establish a hub-and-spoke supply model for health facilities. This initiative is intended to ensure the adequate availability and efficient delivery of oxygen to all targeted facilities providing oxygen therapy nationwide, in alignment with the oxygen strategy.

Purpose and Objectives:

This consultancy has four key objectives:

1. To design or develop a framework, methodology, guidelines, procedures, and tools for forecasting medical oxygen demand for health facilities nationwide. The consultant may utilize or adapt existing local or internationally validated tools and methodologies.
2. Conduct a comprehensive assessment of current and projected oxygen demand across facilities in Sierra Leone using the developed tools.
3. Develop a blueprint for medical oxygen supply chain data reporting for integration into existing Logistics Management Information System (LMIS) and the Computerized Maintenance Management System (CMMS) for management of oxygen equipment and devices.

4. Design an effective hub-and-spoke model for the distribution of oxygen based on production capacity at the 12 PSA plants to facilitate timely and reliable delivery to all target health facilities.

Scope of Work

The consultant will be expected to undertake the following tasks:

1. Situational Analysis: Assess the current oxygen supply chain landscape, including existing forecasting methods, projected production capacity and demand, logistical arrangements, and infrastructure.
2. Development of Medical Oxygen Demand Forecasting Framework
   - Identify key indicators and data sources for accurate demand forecasting.
   - Develop or adapt locally or internationally available methodologies and tools for forecasting oxygen demand at various levels (Hospitals and PHU) in the country.
   - Develop oxygen supply chain reporting tools and provide a blueprint/guideline for integration with existing Logistics Management Information System (LMIS) and/or Health Management Information System (HMIS)
3. Design of Hub-and-Spoke Model
   - Identify potential hub locations based on criteria such as location of the PSA plants and oxygen production capacity, population density/catchment areas, oxygen demand, healthcare needs and logistical considerations.
   - Develop the operational structure for the hub-and-spoke model including distribution network, transportation logistics, storage, and distribution schedules.
   - Create guidelines for the management and operation of the bub-and-spoke system including inventory management.
4. Capacity building: Provide training and capacity-building support to MOH, DHMT, Hospital and other health facility staff on the new forecasting framework and hub-and-spoke model.
5. Pilot Testing and Refinement: pilot the implementation of the forecasting framework in selected hospitals and PHUs and refine the approach and tools based on feedback and lessons learnt.

Management, Organization and Timeframe

- This is an individual consultancy for a 140-days assignment over a period of nine months. The Consultant will be stationed in Freetown with an estimated 40 days of travel to the provincial work sites.
- The consultant will work under the supervision of the Ministry of Health's Health Systems Strengthening Manager, with the UNICEF Health Specialist-Supply Chain serving as a secondary technical supervisor. They will collaborate closely with technical staff from various MOH Directorates, including the Directorate of Policy, Planning and Information (DPPI), the Directorate of Reproductive and Child Health (DRCH), the Directorate of Pharmaceutical Services (DPS), and the National Medical Supplies Agency (NMSA). The consultant will conduct a comprehensive desk review of existing MOH policies and guidelines related to the clinical use of medical oxygen for management of various clinical conditions. Additionally, they will review relevant documents and reports on previous oxygen quantification exercises, planning, and production as well as the national oxygen strategy to guide the consultancy's implementation. Field visits to regional and district hospitals will be necessary to gather data on oxygen requirements and to support planning for the hub-and-spoke model. If needed, the consultant will also organize meetings with stakeholders for validation, technical discussions, and to gather input for the successful execution of the consultancy. This assignment is estimated to run for 140 days implemented over a 9-month period.
- Consultants are be expected to provide their own work tools including laptop and other communication tools required.

Mode of Submission of Applications
Candidates will be required to submit a technical proposal and a financial proposal and the financial proposal should quote a lump-sum inclusive of fees, travel costs and communication costs. Financial proposals may be negotiated.

Work Assignment Overview

Tasks/Milestone:	Deliverables/Outputs:	Timeline:	Payment Schedule
Develop Inception Report	**Inception Report**- Report outlining the consultant's understanding of the assignment, methodology and workplan	5 days	5% of total contract sum
Assess the current oxygen supply chain landscape, including existing forecasting methods, production/demand, logistical arrangements, and infrastructure	**Situational Analysis Report**- Report detailing the status of the oxygen ecosystem including projected medical oxygen production capacity and demand in the country and supply chain management.	10 days	10% of total contract sum
Develop Oxygen Demand Forecasting Framework ○ Identify key indicators and data sources for accurate demand forecasting. ○ Develop methodologies and tools for forecasting oxygen demand at various levels. ○ Develop oxygen supply chain reporting tools and blueprint or guideline for integration with existing LMIS and/or HMIS.	**Oxygen Demand Forecasting Framework**- A detailed document outlining the forecasting methodology, tools, and blueprint for integration with LMIS/HMIS	45 days	25% of total contract sum
Design of Hub-and-Spoke Model ○ Identify potential hub locations based on specified criteria. ○ Develop the operational structure for the hub-and-spoke model. ○ Create guidelines for the management and operation of the bub-and-spoke system.	**Hub-and-Spoke Model Design**-A comprehensive design document including operational guidelines, logistical plans and a map of hub and spoke locations	45 days	25% of total contract sum
Conduct validation workshop ○ Present the draft reports, frameworks, models, and tools to be validated. ○ Lead discussions to gather feedback on the draft deliverables. ○ Revise and finalize deliverables incorporating feedback from stakeholders.	**Validation Workshop report -** including revised frameworks, models tools	5 days	5% of total contract sum

Provide training and capacity-building support to MOH, DHMT, Hospital and other health facility staff on the new forecasting framework and hub-and-spoke model.	**Training workshop report**	5 days	10% of total contract sum
Pilot the forecasting framework in selected hospitals and PHUs and refine the approach and tools based on feedback and lessons learnt.	**Pilot Implementation Report**- Report documenting the results of the pilot testing, including challenges, successes, and recommendations for improvement	20 days	10% of total contract sum
Develop report consolidating all findings, frameworks, models, and recommendation for implementation locally	**Final Consultancy Report**	5 days	10% of total contract sum
	Total	140 days	100%

Estimated Consultancy Fee		
Local travel &DSA (estimated 40 days)		
Communication		
Total Estimated Consultancy Costs[i]		

Minimum Qualifications required:

☒ Bachelors ☐ Masters ☐ PhD
☐ Other

Knowledge/Expertise/Skills required:

Experience

The ideal candidate for this consultancy should possess the following qualifications and experience:

- A university degree in one of the following fields is required: Health Supply Chain Management, Logistics, Biomedical Engineering, Biological Sciences, Public Health or any field of health or another relevant technical field.
- Expertise in Public Health, Healthcare Logistics, Supply Chain Management, Biomedical Sciences particularly in the context of medical oxygen
- Proven experience in demand forecasting and development of supply chain models, especially in the health sector

Skills required:

- Strong analytical, communication and stakeholder engagement skills

Administrative details:

Visa assistance required: ☐
Transportation arranged by the office: ☐

☒ Home Based (MoH will provide workspace whenever required) ☐ Office Based/ Consultant
If office based, seating arrangement identified: ☐
IT and Communication equipment required: ☐
Internet access required: ☐

Consultant Sourcing: ☒ National ☐ International ☐ Both **Consultant Selection Method:** ☐ Competitive Selection (Roster) ☒ Competitive Selection (Advertisement/Desk Review/Interview)			**Request for:** ☒ New Consultancy ☐ Extension/ Amendment
If Extension, Justification for extension: N/A			
Supervisor:	**Start Date:** September 15, 2024	**End Date:** June 30. 2025	**Durations:** 140 days implemented over 9 months

[i] Costs indicated are estimated. Final rate shall follow the "best value for money" principle, i.e., achieving the desired outcome at the lowest possible fee. Consultants will be asked to stipulate all-inclusive fees, including lump sum travel and subsistence costs, as applicable.

Payment of professional fees will be based on submission of agreed deliverables. UNICEF reserves the right to withhold payment in case the deliverables submitted are not up to the required standard or in case of delays in submitting the deliverables on the part of the consultant.

Individuals engaged under a consultancy or individual contract will not be considered "staff members" under the Staff Regulations and Rules of the United Nations and UNICEF's policies and procedures and will not be entitled to benefits provided therein (such as leave entitlements and medical insurance coverage). Their conditions of service will be governed by their contract and the General Conditions of Contracts for the Services of Consultants and Individual Contractors. Consultants and individual contractors are responsible for determining their tax liabilities and for the payment of any taxes and/or duties, in accordance with local or other applicable laws.

The selected candidate is solely responsible to ensure that the visa (applicable) and health insurance required to perform the duties of the contract are valid for the entire period of the contract. Selected candidates are subject to confirmation of fully vaccinated status against SARS-CoV-2 (Covid-19) with a World Health Organization (WHO)-endorsed vaccine, which must be met prior to taking up the assignment. It does not apply to consultants who will work remotely and are not expected to work on or visit UNICEF premises, programme delivery locations, or directly interact with communities UNICEF works with, nor to travel to perform functions for UNICEF for the duration of their consultancy contracts.

UNICEF offers reasonable accommodation for consultants with disabilities. This may include, for example, accessible software, travel assistance for missions or personal attendants. We encourage you to disclose your disability during your application in case you need reasonable accommodation during the selection process and afterwards in your assignment.