I-TECH CIV
Côte d'Ivoire International Training & Education for Health

Date December 15, 2021

COTE D'IVOIRE DNO SOW

Dear,

I-TECH CIV hereby requests the selection of a contractor to coordinate the DNO (Diagnosis Network Optimization) process and identify geospatial mapping needs for HIV viral load (VL) testing, early infant diagnosis (EID), tuberculosis (TB) and COVID-19 in Côte d'Ivoire according to the following terms of reference:

Terms of Reference (TOR)	
Recruiter	I-TECH CIV/ABIDJAN COTED'IVOIRE
1. Background	Diagnostic network optimization (DNO) is a geospatial network analytics approach to analyse the current diagnostic network and recommend the optimal type, number and location of diagnostics and an associated sample referral network that together enable greatest access to services, while maximizing the overall efficiency of the system. DNO enables decisions on the best network design in a given setting through evaluation of testing demand, testing capacity and utilization, cost efficiency, access to services, and application of real-life constraints. As part of DNO, these factors are analysed to generate insights on the best network configuration and understand trade-offs between cost, access and device utilization. DNO analysis can be particularly useful when a network assessment shows significant gaps in service delivery, when procurement of new diagnostic devices or integration of new tests on existing devices is being considered, or when improving access to services is a priority. Insights from DNO can contribute to evidence-based national strategic plans, funding requests, resource allocation, as well as procurement and operational planning. DNO can be tailored to country-specific needs and priorities; a typical DNO exercise comprises five key steps. Initially, a multi-stakeholder project team defines the scope of the analysis, in terms of which diseases, tests, and geographies need to be considered and priority questions to be answered, as well as identifying budgetary or other constraints to be incorporated in the analysis. Next, available data are identified, collated, and cleaned for entry into the DNO tool. From this, a baseline model of the network can be developed, i.e. a digital representation of how the diagnostic system is currently organized, to identify gaps in the current network. Subsequently, this model is adjusted to investigate the effect of varying factors such as device locations, test menu, sample flows, and the impact of applying various constraints such as maximum turnaround

times or service distances. The resulting scenarios can be analysed and compared to investigate options for the future network, and scenarios can be refined to identify the most feasible and impactful solution for the context. Preferred scenarios can then be implemented, and the effect of changes in the network can be monitored. DNO analyses can be subsequently updated to incorporate significant changes to the assumptions and inputs.

In Cote d'Ivoire, currently several instruments are being used to realize multiple testing/disease diagnosis such as HIV viral load (VL), early infant diagnosis (EID), tuberculosis (TB), COVID-19, etc. For the VL and EID testing, the country has 16 Roche Cobas 48, 7 Roche Cobas 96, 1 Roche Cobas 6800, 4 Biocentric, 01 GeneXpert GX4, 27 mPima machines. Following the terms of the current reagent rental agreement with the MOH, Roche is replacing all Cobas 48 & 96 with new cobas 4800 instruments with higher capacities. The instruments are currently placed in 19 VL and EID labs, including two sites equipped with both Roche and Biocentric. In addition, to improve access to EID for children under two years and to improve viral load coverage in pregnant and breastfeeding women, a reagent rental agreement has been recently signed by MOH with Abbott and 33 mPima machines are under installation to reach a total of 60 instruments installed countrywide.

Although the national VL, and EID laboratory information system routinely tracks sample turnaround times and rerouting, and other corrective actions; further efficiency gains are required as the referral system for specimen collection from clinical site to laboratory testing site relies on PEPFAR implementing clinical partners and is not integrated into a national harmonized system. The first review of this network was completed in 2019 by the American Society for Microbiology (ASM) and further activities to build on this assessment are planned for 2021 in collaboration with the Global Fund and other stakeholders.
Building on the results of the molecular diagnostic network baseline assessments from the 2019 CDC Technical Assistance to define the optimal combination of devices and identify the most suitable locations where instruments should be placed, I-TECH CIV is looking for a contractor to achieve the complete optimization of the diagnostic network.

2. Scope of Work / Objective	I-TECH CIV is recruiting a contractor to coordinate the DNO (Diagnosis Network Optimization) process and identify geospatial mapping needs for HIV viral load (VL) testing, early infant diagnosis. (EID), tuberculosis (TB) and COVID-19 in Côte d'Ivoire. The objective of this DNO is to provide insights around testing demand, testing capacity and utilization, cost efficiency, and access to services. And to analyse the current diagnostic network and recommend the optimal type, number and location of diagnostics, laboratory supply chain management, specimen to result turnaround time and an associated sample referral network that together will enable greatest access to services, while maximizing the overall efficiency of the system.

The recruited contractor is expected to oversee and harmonize the objectives and the approach of the MOH and the national stakeholders to run an appropriate DNO.

The DNO will be used to design an optimal laboratory network to deliver on the following objectives:

- Establishment of a full integrated diagnostics and multiplex testing to support multiple diseases: HIV, TB, COVID-19, and other diseases of public health importance
- Optimization of instrument location, accounting for human resource needs and considering different molecular tests and various sample types such as DBS, plasma separation card (PSC), plasma, etc.
- Integration of POC for multiplex testing to ensure appropriate access and rapid results return for priority populations
- Optimized linkage of health facilities to testing sites
- Improvement of service distance and meeting defined target turnaround times for different tests within the network
- Improvement of sample transport time, flexibility, and costs

These broad objectives will be further refined and customized for the local context and priorities during the initial phase of MOH and stakeholder engagement.

Contractor Roles and responsibilities:

- Act as the lead expert technical resource for diagnostic network optimization
- Lead the process for conducting DNO, including technical assistance to MOH and partners at all stages, including defining the DNO objectives and scope, technical support for data collection (to be coordinated by I-TECH), creating baseline model in the DNO software, defining, and running optimization scenarios, interpreting outputs, and providing TA for selection of optimal network designs for implementation.
- Organize and facilitate stakeholder meetings
- Develop a final report with an operational plan
- Provide support for capacity building to the MOH and stakeholders around DNO concepts, use of outputs and impact and facilitate sharing of other country experiences of DNO
- Provide training and coaching support in use of data templates and selected software for I-TECH data team with the goal for ITECH team to be trained sufficiently to perform an independent analysis in the future

Key deliverables:

	The contractor will work closely with MOH and all stakeholders and the support of the ITECH CIV team to deliver the following:
	- Report on DNO findings and recommendations on the optimal network design as well as facilitate the development of an operational plan to implement findings. - DNO outputs, including data sets, network models in open access DNO software including baseline model and future state scenarios, set of standard network metrics for current and future state including access, cost and efficiency - Training of DNO strategic decision makers and DNO analysts completed - Capacity built within the MOH to refine and revise the diagnostic network model as part of ongoing network optimization continuous quality improvement The expected outcomes of this DNO project: **Increase access to testing, and generate greater public health impact,** as improved device placement and integrated specimen referral network aim to bring capacity where it lacks, and shorten TAT **Increase network efficiencies**, through the implementation of integrated supporting systems, such as sample transportation, results delivery, and data management **Decrease total cost per test**, as the increase in instrument utilization reduces the contribution of fixed costs over the total cost per test
3. Duration of the mission	The duration of the contract is 9 Months (must be completed by end September 30th, 2022)
4. Place where services must be provided	This DNO exercise will take place in Cote d'Ivoire, central laboratory institutions, regional, district and health centers laboratory. Additional non health institution will be integrated in the evaluation if indicated appropriate by the MOH
5. Methodology	**Activity one**: Stakeholder's alignment and scope definition - Create platform for DNO discussions and decisions to take place, via existing technical working group structures. - Define DNO scope (e.g., full or partial/phased disease program integration, which tests, and devices will be included in the analysis, and constraints to be considered including available budget envelope for systems strengthening), and resources required to support the exercise - Select Software; preference is given to an open access tool to enable country capacity building and ability to repeat DNO in future - Develop activity plan for the DNO

Expected output for Activity one:
- DNO scope defined
- software selected
- DNO activity plan developed

Activity two: Data Collection and National Level Network Requirements
- Develop and validate all the data collection tools
- Organize a training session on data collection tools
- Collect data (site visits, health personnel interviews…)
- Conduct preliminary analysis of network to identify gaps
- Proceed to data cleaning and analysis

Expected output for activity 2:
- DNO data collection developed and validated by the TWG
- The stakeholders have been trained on tools
- Data collection activity implemented

Activity three: Network optimization:
This aim to run alternative scenarios that optimize device placement, allocation of testing demand and optimal referral linkages.

The following will be implemented:

- Input collected data into optimization software and visualize existing lab network,
- Forecast future demand based on national testing strategies and targets.
- Develop optimized scenarios to address identified gaps
- Estimate cost, and feasibility of proposed scenarios, and select final scenarios, with proposed devices

Expected output for Activity 3:

- Mapping of all HIV/TB clinic facilities, of all molecular instruments, of specimen referral networks
- Recommendations on new device placements or consolidation, device redeployments, and on referral linkages considering all platforms, both conventional and POC, available in the country as per testing scope defined.
- Recommendations on transformation requirements to support multiple diseases, improve turnaround time, lab supply management, lab information system, and instrument connectivity
- Estimated testing volumes allocated to each type of instrument, new instruments to place.

Activity 4: Provide inputs for operational plan design: Stakeholder workshop

	● Presentation of the Baseline Model used.
	● Presentation and discussion on the agreed Scenarios and other findings to stakeholders
	● Presentation to decision makers, donors, and stakeholders
	● Report Writing (to include an operational plan and timelines)
	Expected output for Activity 4:
	● Guide on policies and guidelines needed to optimize the lab network as well as funding needed for plan implementation
	● Guide on HR needs, qualifications, and trainings
	● Guide monitoring and evaluation for tracking performance of the system
	● Guide on supply chain improvement, needs etc.
	● Infrastructure and equipment
	Operational/implementation plan development is outside of the scope of this project and will be led by MOH.
6. **Expertise, qualifications, and Required Skills, including the requirements linguistic:**	- Have proven skills in laboratory areas, particularly in the assessment and strengthening of laboratory systems. - Have conducted a Diagnosis Network Optimization exercise in a African country; - Have adequate Human Resources. - Excellent communication and writing skills in French and English
7. **other information evant or conditions particular**	The application file must necessarily include the following elements: - A file highlighting the experience of the contractor including references - A technical and financial proposal. - The CVs of qualified staff: Interested candidates are requested to send to: recrutement@itech-civ.org no later than January 20th 2022