USAID | DELIVER PROJECT

Assessment Tool for Laboratory Services and Supply Chains (ATLAS)

JUNE 2010

This publication was produced for review by the U.S. Agency for International Development. It was prepared by the USAID | DELIVER PROJECT, Task Order 1.

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The USAID | DELIVER PROJECT, Task Order 1, is funded by the U.S. Agency for International Development under contract no. GPO-I-01-06-00007-00, beginning September 29, 2006. HIV-related activities of Task Order 1 are supported by the President's Emergency Plan for AIDS Relief. Task Order 1 is implemented by John Snow, Inc., in collaboration with PATH; Crown Agents Consultancy, Inc.; Abt Associates; Fuel Logistics Group (Pty) Ltd.; UPS Supply Chain Solutions; The Manoff Group; and 3i Infotech. The project improves essential health commodity supply chains by strengthening logistics management information systems, streamlining distribution systems, identifying financial resources for procurement and supply chain operations, and enhancing forecasting and procurement planning. The project also encourages policymakers and donors to support logistics as a critical factor in the overall success of their health care mandates.

Recommended Citation
USAID | DELIVER PROJECT, Task Order 1. 2010. *Assessment Tool for Laboratory Services and Supply Chains (ATLAS).* Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1.

Abstract
The Assessment Tool for Laboratory Services and Supply Chains (ATLAS) is a data gathering tool developed by the USAID | DELIVER PROJECT to assess laboratory services and logistics. The ATLAS is a diagnostic and monitoring tool that can be used as a baseline survey to complete an annual assessment or as an integral part of the work planning process. The ATLAS is both a quantitative and qualitative tool. The information collected by using the ATLAS is analyzed to identify issues and opportunities and to outline further assessment and/or appropriate interventions.

Cover photo: A lab technician, doctor, and USAID | DELIVER PROJECT staff at a district hospital laboratory in Uganda, photo taken September 17, 2005, by Johanna Useem.

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Acronyms

AIDS	acquired immune deficiency syndrome
AIM	AIDS/HIV Integrated Model District Program (USAID-funded)
AMREF	African Medical and Research Foundation
CD4 cells	cluster of differentiation 4 cells
GPS	global positioning system
HC	health center
HIV	human immunodeficiency virus
LMIS	logistics management information system
MOH	Ministry of Health
PCR	polymerase chain reaction
RPR	rapid plasma regain
SOP	standard operating procedure
STI	sexually transmitted infection
TB	tuberculosis
USAID	U.S. Agency for International Development
ZN	Ziehl-Neelsen

Acknowledgments

Many thanks to all who have assisted with the development of this tool in its first version in 2006, including Abdourahmane Diallo and Wendy Nicodemus. Special thanks go out to the Ministries of Health and field offices in Zimbabwe, Malawi, and Indonesia who provided critical information for this update. Updating ATLAS has been a collaborative process with many who have used the tool, including Patrick Msipa, Carmit Keddem, Claudia Allers, and Marasi Mwencha. Thank you to Ethan Collins for his helpful contributions as a member of the monitoring and evaluation team. Finally, many thanks go to Naomi Printz for steering this tool in the direction it needed to go and managing that process, and to Kelly Hamblin and the Communications Team for assisting in the final production stages of this tool's development.

The U.S. Agency for International Development (USAID) contracts funded the technical assistance, in-country projects, and research that enable the authors to produce the experience and lessons learned here. We are deeply grateful to the team of professionals in the Commodity Security and Logistics Division in the Office of Population, Health, and Nutrition, and the Office of HIV and AIDS who provided the support for the production of this publication.

Sincere thanks go to the extended core team of dedicated technical staff from the field and the project office in Arlington who provided valuable input to this tool's development.

We hope that as programs grow increasingly aware of the need for developing laboratory logistics systems, this tool will assist in assessing the laboratory logistics systems and determine what gaps need to be addressed.

User's Guide

Introduction

Background and Intended Use

The Assessment Tool for Laboratory Services and Supply Chains (ATLAS) is a comprehensive data gathering tool developed by the USAID | DELIVER PROJECT for assessing national laboratory systems. The ATLAS, a diagnostic and monitoring tool, can be used for a baseline survey and for completing subsequent assessments for measuring changes in the laboratory logistics system or as an integral part of the work planning process. The information collected by using the ATLAS is analyzed to identify challenges and opportunities for improvement in the laboratory logistics system and to outline next steps, such as supplementary assessment or additional interventions.

Assessments using the ATLAS can be conducted and analyzed in successive years. The results can contribute to the monitoring, improving, and sustaining of laboratory logistics system performance and to provide critical non-logistics data that identify a country's laboratory systems' strengths and weaknesses.

Benefits

The ATLAS can—

- Provide stakeholders with a comprehensive view of all aspects of the laboratory services and supply chain; a snapshot of testing capabilities and commodity availability at laboratories throughout the system; and input for work planning.
- Be used as a diagnostic tool to identify issues and opportunities for the national laboratory system and for individual laboratories in a given country; and by country personnel as a monitoring tool (to learn and continually improve performance).
- Raise collective awareness and ownership of the laboratory system, including laboratory services, supply chain performance, and goals for improvement

Sections of the ATLAS

The ATLAS contains two questionnaires:

- The Central/Intermediate Administrative Level Questionnaire (primarily qualitative)
- Facility Level Questionnaire (for an individual laboratory) (primarily quantitative).

The questionnaires will need to be adapted for the in-country laboratory system. In a highly decentralized system, both questionnaires will need to be adapted (see the section *Adapting the ATLAS*).

Overall Process for Conducting a Laboratory Assessment Using the ATLAS

Timing of the Assessment

The ATLAS can be conducted at any time as a baseline assessment or at a time agreed on within selected countries. Ideally, the ATLAS should be conducted within the three-month period prior to a work planning or strategic planning exercise.

The ATLAS provides a comprehensive overview of how a laboratory supply chain and the structures that support it function, particularly at the facility level. The quantitative data it provides can facilitate performance and process improvement. However, the repeat use of the ATLAS depends on the outcomes after the interventions are implemented. It is preferable to wait for interventions to take place and have some effect on the system before repeating an assessment using the ATLAS.

Preparatory Research

Some aspects of the ATLAS should be researched in advance of the group discussion and field visits. The general levels of the laboratory system should be identified (i.e., whether the country uses zonal, provincial, or regional levels and extends to the district and health facility levels). The assessment team should also know whether some key functions are decentralized. In many countries, key policy and logistics decisions are made at an intermediate administrative level (e.g., the district or the regional office). In this case, the questionnaires will need to be adapted to reflect the different responsibilities at each level (see the section *Adapting the ATLAS* for more information).

Additionally, the assessment team should try (if possible) to collect and review all laboratory policy and guideline documents prior to conducting the group discussion or the key informant interviews. These documents can help guide the discussion.

Data Collection Methods

Talk with the program managers or country counterparts and agree on the approach to be used.

In general, three methods are recommended for data collection:

- Discussion groups can be conducted at the central level with officials at that level only (using the central/intermediate administrative level questionnaire adapted for central level only) or with representatives of both the central and intermediate levels (using the central/intermediate level questionnaire). These groups may require a half to a full day to gain the breadth and depth of data required and to provide adequate opportunity for full participation.
- Key informant interviews can be conducted at the central and intermediate levels. If key informant interviews are conducted, it may be necessary to interview multiple people with varying degrees of knowledge of the system to complete the questionnaire. All key informant interviews should be consolidated, and the answers should be reconciled.
- Field visits are the preferred method to use for the facility level assessment. These visits are necessary to observe and evaluate laboratory infrastructure and storage conditions, and to assess the availability and status of laboratory equipment and supplies.

For a comprehensive and useful assessment, it is highly recommended that a combination of discussion groups (and key informant interviews, if appropriate) be used for the central/intermediate level questionnaire and field visits for the facility level questionnaire.

After the data collection is complete, a joint discussion group that includes representatives from all levels and all programs (e.g., laboratory services, tuberculosis (TB), leprosy control, HIV and AIDS, malaria, etc.) should be organized to reconcile findings and develop a work plan.

Planning Field Visits

If the assessment is intended to develop strategies for systemic interventions (e.g., design a logistics system for laboratory supplies), field visits to sample facilities should be included and planned. Before drawing the sample, all parties should agree on the criteria for selecting the facilities. A sampling frame that includes the complete list of facilities to be assessed will be required. The list should be stratified by region/province, facility type, and urban or rural area, as appropriate. Ideally, the sample size should be allocated proportionally within each stratum (i.e., region/province, facility type, urban or rural, etc.). A stratified sampling will provide more precision than a random sampling. The sample size should be determined on the basis of standard statistical formulas.

In case of resource constraints, visit a default number of a minimum of 100 facilities.[1] Fewer facilities may be considered for cross-sectional rapid assessments or qualitative studies but are not ideal to measure (statistically) significant changes over time. In some cases, to avoid extensive traveling, two-stage sampling may also be considered. In the first-stage, the administrative areas (e.g., region, province, district, etc.) are randomly selected, followed by selection of the facilities during the second stage.

If the plan is to provide information for the development and implementation of interventions specifically for each facility, then a countrywide assessment plan should be developed and a visit to each laboratory facility considered for the intervention.

Field visits should be made after discussion sessions and interviews with the central level because the facility level tool will need to be customized for a specific program or country. It is recommended that the interviewers make field visits with appropriate stakeholders, if possible. All field visits should be scheduled ahead of time to ensure that the appropriate staff member will be available.

Field visits offer an opportunity to explore the issues identified during the discussions/interviews, enhance the quality of the information gathered, and allow for additional data collection. Those making the field visits need to focus on unanswered ATLAS central questions; mixed, unsure, or contested data; and disparate or wide-ranging responses to questions. They should also take a more in-depth look at the particular areas of the lab. Program managers and/or country counterparts can help plan the appropriate number of visits.

Number and Qualifications of Data Collectors

It is important that the same data collectors are available for both the group discussion sessions and field visits. Because many laboratories have limited space and no facilities for visitors, it is important to give careful consideration to the number and the skill sets of the data collectors. The assessment

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1. For detail on sample size estimation, see *Sampling Manual for Facility Surveys for Population, Maternal Health, Child Health and STD Programs in Developing Countries*. MEASURE Evaluation Manual Series, No. 3. The manual is available at: http://www.cpc.unc.edu/measure/publications/pdf/ms-01-03.pdf.

teams should usually not exceed four members during a field visit. Each evaluation team should include at least one interviewer with laboratory experience, who can understand and interpret the terminology specific to laboratories, and at least one interviewer with experience assessing and designing logistics systems.

Training for data collectors going to the facility visits should be conducted so that each team sent out has the same understanding of how the questionnaire should be filled out. This will ensure the quality and consistency of data.

The adapted facility level questionnaire should be piloted by the teams and final adaptations made as needed. The field copies are then finalized and printed for the assessment teams going to the facilities.

Selecting Interviewees

Central Level

To obtain accurate data about the functioning of each aspect of laboratory services, it is important to interview the right set of people.

At the central level, it is critical to identify the division or unit that is responsible for managing laboratory services and commodities in a specific country. Representatives from the senior management of that unit are the most appropriate interviewees for this level. In addition, representatives from programs that require testing services (e.g., HIV and AIDS, TB, sexually transmitted infection [STI], malaria, etc.), the division responsible for quantification of laboratory supplies (e.g., Pharmaceutical Services Unit at the Ministry of Health (MOH), the division responsible for procurement (e.g., the Ministry of Finance), and the senior stores officer from the supplying facilities (such as the central medical stores or the national reference laboratory) should be interviewed using the central/intermediate level administrative questionnaire.

Intermediate Level

In a decentralized setting, where facilities may also have management roles similar to that at the central level, the central/intermediate level administrative questionnaire may need to be adapted. Members of the district or regional level management team are usually appropriate for conducting interviews in a decentralized setting. These management teams include, among others, district or regional medical officers in charge, head financial officers, chief pharmacists, chief laboratory technologists, medical superintendents, and, in some cases, representatives from the community.

Facility Level

The laboratory technologist in charge is the correct person to interview. In his or her absence, the most senior laboratory technologist (or technician) can be interviewed. Any of the technical staff in the laboratory should be able to answer most of the questions in the facility level section of the tool. It is important to remember that this step includes an extensive inspection of the laboratory supplies storage area, infrastructure, and equipment. Therefore, a knowledgeable technician should be interviewed. At the facility level, the data collection team can split into two groups: one will observe and record information on the laboratory infrastructure, availability and status of laboratory equipment, and storage conditions for laboratory supplies; the other will interview laboratory staff to collect information on personnel, testing services, and inventory management.

Table 1 shows the required knowledge areas for the interviewees, by level.

Table 1. Required Knowledge Areas of Participants, by Level

Knowledge Area	Central Level	Intermediate Level	Facility Level
National laboratory system organization	X	X	
National policies	X	X	X
Quantification	X	X	
Procurement	X	X	
Financing	X	X	
Storage and distribution	X	X	X
Inventory management	X	X	X
Logistics management information system (LMIS)	X	X	X
Laboratory LMIS	X	X	X
Supervision	X	X	X
Laboratory personnel	X	X	X
Laboratory testing services	x	X	X
Testing for quality assurance	X	X	X
Equipment availability and maintenance	X	X	X
Supply availability	X	X	X
Laboratory infrastructure			X

Data Encoding and Analysis

Following data collection, the completed response to the central/intermediate and facility level questionnaires should be entered into a database. To ensure the quality of the data collected, the completed questionnaires should first be examined for omissions and errors. Qualitative responses to open-ended questions should be coded, if possible, before entering the data. It is also possible to summarize the strengths and weaknesses recorded on the central/intermediate administrative level questionnaire.

Before conducting data analysis, the analysis plan should be outlined according to the survey objectives. Ideally, the data should be entered using software (e.g., Access, Epi Info,[2] etc.) that allows monitoring of the data entry quality. Tables and graphs should be used to present the results. If the number of facilities from which data were obtained are limited (i.e., less than 20), the data can be entered and analyzed by using an Excel spreadsheet.

Analysis of the Collected Information

Data analysis and work plan development should take place immediately following data collection. To develop and prioritize a set of objectives and interventions that are designed to address issues raised through the assessment, this process should include a thorough review of laboratory system strengths and weaknesses.

2. Epi Info is a widely used software for capturing survey data in developing-country settings. The software is available for free from the Centers for Disease Control and Prevention website. Epi Info can be learned from the manual and tutorial provided with the software.

The information collected through the ATLAS can be used as baseline data, as part of an annual assessment, and/or as part of the work planning process. These are discussed separately below.

If the ATLAS is being used to gain baseline information, policymakers can use the data collected to plan for initial interventions in the national laboratory system. This could include identifying problem areas, identifying strengths and weaknesses of the current system, and identifying laboratories for intervention.

When the ATLAS is used as part of an annual assessment, the data from the ATLAS can be used to monitor results from previous interventions.

To inform the work planning process, users can review strengths and weaknesses of the laboratory system and can use the information to develop appropriate objectives and interventions as part of an effective work plan. This can be especially helpful with the development of strategic laboratory policies as well as with the functioning of the laboratory logistics system.

Adapting the ATLAS

Prior to conducting any interviews or field visits, the evaluation team should adapt all of the questionnaires to reflect the appropriate levels in the system for which these tools will be used. Following are some specific adaptations that should be considered.

Central/Intermediate Administrative Level Questionnaire

If the assessment team is able to obtain the policy documents prior to the central level discussion, the answers should be incorporated into the questionnaire and verified during the interview(s). Many of the answers in this questionnaire will be used to adapt the facility level questionnaire.

Depending on the level of decentralization, the central/intermediate level administrative questionnaire can be used at either the central level or the intermediate level, or both. Intermediate level could be province, state, zone, region, district, etc. In a decentralized system, most of the intermediate level facilities act as "central levels" and so would be asked the same questions that you would ask the central level in a centralized system. For example, if the intermediate level actually does forecasting and procurement for all facilities in their catchment area, they should be asked the questions in the forecasting and procurement sections.

Any questions that were answered by the central/intermediate level regarding policy will need to be considered at the facility level. If there are no set national guidelines or protocols, Section II will need to be adapted.

The following questions will need to be adapted to reflect the correct levels in the system:

- Section VI, question 8
- Section IX, questions 1 and 2.

Facility Level Questionnaire

The facility level questionnaire is meant to be very adaptable and customizable to the country-specific situation. The questions provided in various sections of the tool serve as examples and provide guidance. Additional questions relevant to a country situation may be added, and existing questions may need to be modified. For example, in the General Information section of the facility

level questionnaire there is space to record global positioning system (GPS) coordinates. If the country does not use these, this question may be deleted from the questionnaire.

Questions asked at other levels may need to be validated at the facility level. Specific examples include:

- Section I: National Guidelines and Protocols. If there are no set national guidelines or protocols, this will need to be adapted. For example, question 4 should be adapted to reflect infection control guidelines available in the country; if not, it may be deleted.
- Section III: Laboratory Testing Services: Part A. Tests Performed at Laboratory. This part will need to be adapted to reflect the approved testing techniques by level. If this is not standardized for the country, the evaluation team will need to work with the central level decisionmakers to identify a standard list of the techniques that should be performed at each level of the system. The tests to be included in the assessment should be determined by the host country depending on the focus of the assessment. For example, a national TB reference laboratory will not necessarily conduct many of the tests in the illustrative list of tests in Part A. Tests Performed at Laboratory. Only those tests that the laboratory conducts and that are included in the assessment need to appear in this section; the other tests can be removed to avoid confusion during data capture. The techniques listed are also illustrative. Country-specific techniques need to be indicated in the techniques column as part of adapting the tool.
- Section III: Laboratory Testing Services: Part B. Specimen Referrals. This will also depend on the country situation. Not all laboratories refer specimens; therefore, for some laboratories this section may be omitted.
- Section IV: Quality Assurance. This section deals with quality assurance activities that have an impact on the supply chain, and not necessarily the technical testing aspects related to the quality of laboratory testing services. Detailed technical aspects may be included as desired by those conducting the assessment.
- Section VI: Logistics Management of Laboratory Supplies: Part E. Availability of Sample Reagents and Infection Control Supplies. This part is a short survey on the availability of laboratory supplies at the facility level. The list of supplies should remain manageable and should be decided on consultation with the central level decisionmakers to determine which reagents and supplies will best reflect overall commodity availability. Ideally, the selected reagents would be required for conducting the tests listed in Section III: Laboratory Testing Services: Part A. Tests Performed at Laboratory. A specific set of reagents and supplies needed to provide a test may also be considered for this section.
- Section VII: Equipment Availability and Maintenance. This section focuses on automated equipment, which may include chemistry analyzers, hematology counters, and cluster of differentiation 4 cell (CD4) counters. Model-specific names vary from country to country, and these should reflect the equipment in use in the country. If the equipment is known, the first column can then be populated during the adaptation of the tool. The remaining columns are intended to collect additional information about the equipment. These can also be modified by adding more or eliminating columns, as needed. Part C. Equipment Gaps should be also completed if Equipment Availability and Maintenance is being assessed. If not, this section may be omitted when adapting the tool.

- Section VIII: Laboratory Infrastructure. This will need to be adapted to country-specific guidelines about work area regulations. These areas should be reviewed and approved by the central level decisionmakers.

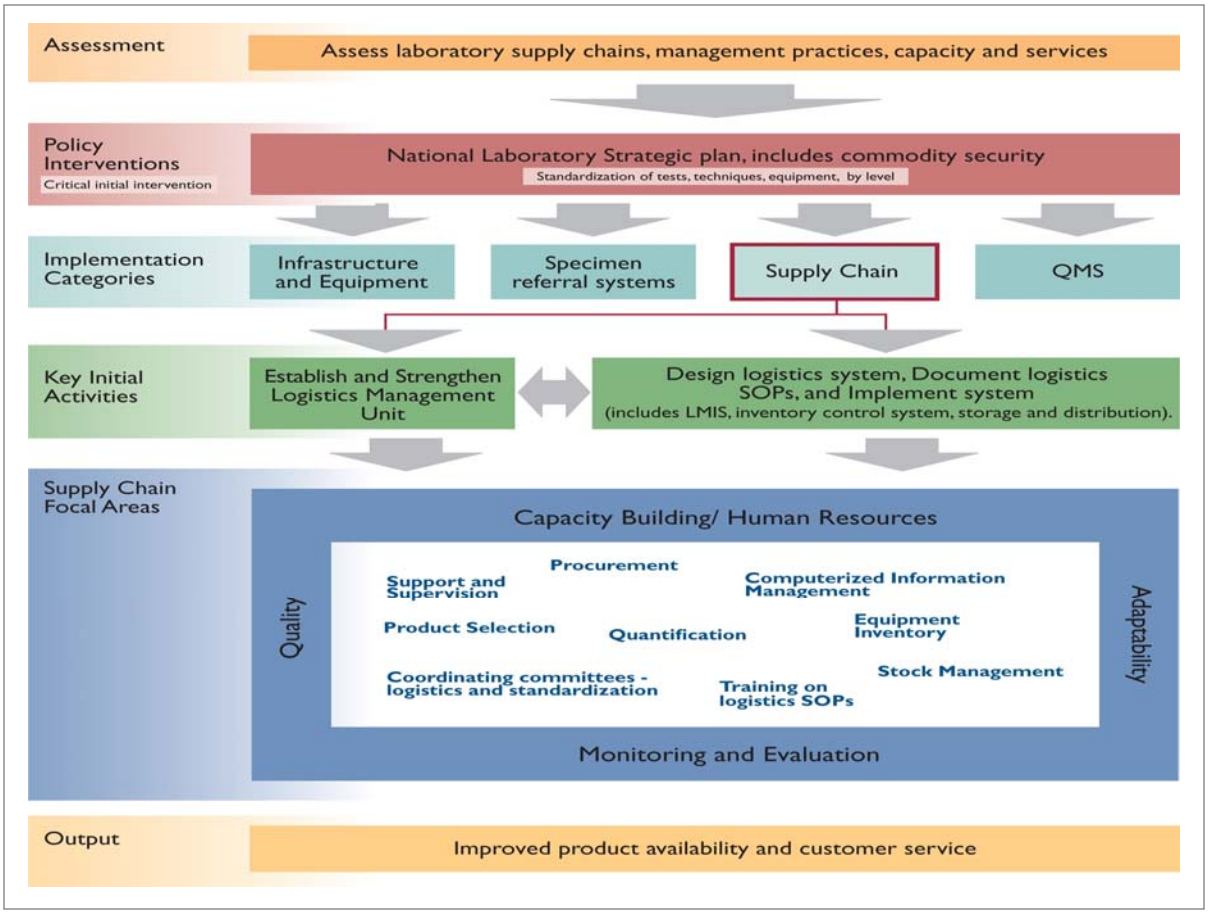
Assessment as a Key Element of System Strengthening

Before any intervention to strengthen the logistics system for laboratory services can be implemented, it is essential to first understand the current status of the laboratory logistics system, management structure, and service model, as well as the context in which the supply chain functions. A basic understanding of the environment and the existing challenges in commodity management will highlight the appropriate interventions needed to strengthen the laboratory system. By understanding the current status and country context, it is possible to identify and prioritize the most appropriate activities to strengthen the supply chain and the laboratory system. In each country, the interventions required and the times and means of implementing them will differ. As national laboratory logistics systems are virtually non-existent and laboratory personnel's experiences with such systems are limited, assessments are critical for advocacy and to sensitize stakeholders to the need for a standard national logistics system.

The ability to provide laboratory services in a country or program is dependent on the availability of products to perform the tests assigned to each laboratory. As seen in Figure 1, assessment of the laboratory system, including the supply chains, management practices, capacity, and services, is the first step in strengthening laboratory systems. Though this tool focuses primarily on the assessment of the supply chains supporting the laboratory system, all parts of the system are intertwined and each of the pieces of the laboratory system must function well in order to strengthen the health system as a whole. Assessments help to pinpoint areas that need improvement and, hence, the interventions that can bring about the desired results.

Following an assessment, it is important to institute interventions that will ensure availability of services and supplies. Figure 1 shows the overall approach that the USAID | DELIVER PROJECT recommends. It can be seen that an assessment is the logical entry point to identify specific issues. That way the most appropriate interventions targeting and addressing specific areas in the supply chain and laboratory system are put in place. Focusing interventions on defined areas is made possible only if the issues are clearly understood, and an assessment provides this important information.

Figure 1. Strengthening Laboratory Systems through Investments in Supply Chains



Central/Intermediate Administrative Level Questionnaire

Country name: _____

Program name(s): _____

1. Name of interviewer:	
2. Date:	
3. Name and title of person being interviewed:	
4. Name of department:	
5. Physical and postal address:	
6. Telephone/cell phone:	
7. Email address:	

Section I. Organization

1. How are the laboratories organized? Describe all levels of the program and the relationships between the levels. Attach an organizational chart, if available. (*Include documents that define responsibilities and services provided at each level.*)
2. How many laboratories does the MOH/this program manage at each level?
3. Are all laboratory supplies managed (reporting, ordering, distribution, and storage) through one system or through multiple systems (e.g., TB, malaria, HIV and AIDS, essential medical supplies, different donor programs)? List all the systems currently operating in the country.
4. If multiple systems exist in question 3, are duplicate supplies (reagents and consumables) and equipment distributed through multiple programs? Describe.
5. If multiple systems exist in question 3, is there a laboratory unit/division/committee operating that coordinates vertical laboratory activities in the country?

Comments:

Section II. Policy

1. Is there a unit responsible for formulating national policies on laboratory services?
2. What is the composition of the unit (numbers, positions, departments)?
3. Who supervises the unit?
4. Is there a national policy document for laboratory services? (If no, skip to question 8.)
5. What areas are covered in this policy document (e.g., staffing by level, administrative protocol, product selection, procurement, etc.)?
6. Does the policy document include the process of evaluating and approving reagents for disease screening tests (HIV, hepatitis, STIs)?
7. Does the policy document include the following:
a. Laboratory services packages (test menu) by level?
b. Laboratory test techniques by level?
Please provide a copy of any policy documents.
8. Are there documented standard operating procedures (SOP) for tests performed at each level? (If no, skip to question 11.)
9. Does the SOP provide a list of essential supplies (reagents and consumables) per test?

10. Does the SOP provide a list of essential equipment by level?

Please provide a copy of the SOP manual.

11. Are there written guidelines on safety precautions? (*Check all that apply.*)

- ☐ a. Infection prevention
- ☐ b. Safe disposal of sharps (i.e., needles, etc.)
- ☐ c. Safe disposal of biohazardous medical waste
- ☐ d. Use of protective gear
- ☐ e. Other (specify)……..

12. Are there written guidelines for post-exposure prophylaxis for HIV?

13. Are there written guidelines for post-exposure prophylaxis for hepatitis B?

14. Are there written guidelines for disposal or destruction of damaged and/or expired laboratory products?

15. Is the automated laboratory equipment standardized nationally? (*Specify for each.*)

- ☐ a. Hematology
- ☐ b. Immunohematology
- ☐ c. Chemistry

16. If yes to question 15, what are the recommended standards for the country?

- ☐ a. Hematology
- ☐ b. Immunohematology
- ☐ c. Chemistry

17. Is there a unit responsible for selecting, evaluating, and approving equipment to establish suitability before equipment is accepted for use in the country? Please describe the unit.
18. Is there a unit responsible for equipment maintenance and service in the country? Please describe the unit.
19. Are there arrangements in place for provision of spares and maintenance of closed system equipment after their warranty period has ended?
20. Are there disposal guidelines for obsolete laboratory equipment?
21. Are there written national laboratory procedures for quality assurance?
22. Are procedures for internal quality assurance included?
23. Are procedures for external quality assurance included?
Comments:

Section III. Quantification

1. Are laboratory supplies (reagents and consumables) quantified for all programs?

2. List programs for which laboratory supplies are quantified, how often the quantification is conducted, the title of the person(s) or division responsible, and the information used to quantify laboratory supply needs. Also include quantification tools used and partners providing technical assistance if available.

Program	Frequency	Title of Person Responsible	Data Used	Quantification tool	Partner Providing Technical Assistance

3. List programs where laboratory supplies are not quantified.

Comments:

Section IV. Procurement

1. Are there national procurement guidelines for:
a. Laboratory supplies (reagents and consumables)?
b. Laboratory equipment?
2. Describe the procurement process, using a process map for the national level. (*Specify any differences by program and/or donor.*)
3. What is the average procurement lead time for each program and/or donor specified above?
4. Is a person or division responsible for:
a. Procuring laboratory supplies (reagents and consumables) and equipment? (*Specify by program.*)
b. Monitoring the procurement process? (*Specify by program.*)

c. Coordinating procurements across programs? (*Specify by program.*)
5. In general, are adequate amounts of all laboratory supplies received? (*Specify any program differences.*)
6. Are laboratory supplies received in an appropriate time frame?
7. What other partners procure laboratory supplies?
8. Are there any local distributors for major supplies for hematology, biochemistry, immunology, and microbiology?
9. If yes to question 8, do the distributors also supply laboratory controls?

Comments:

Section V. Financing

1. What are the sources of existing funding for laboratory services, including infrastructure, supplies (reagents and consumables), and equipment? Indicate the percentage of funding contributed by each source:	
a. Government?	_____ % of total funding
b. User's fees/cost recovery?	_____ % of total funding
c. Donors (list by donor)? Donor 1:_____ Donor 2:_____ Donor 3:_____	_____% of total funding _____% of total funding _____% of total funding
d. Other? (*specify*):_____	_____% of total funding
2. Are funds sufficient to cover the needed supplies and equipment? If not, what is the gap?	
3. Does a committee or division coordinate the different sources of funds?	
4. How are financial resources allocated to laboratories? Describe all levels of the program and the relationship between the levels. Attach a financial organizational chart. (*Specify what financial decisions are made at each level.*)	
5. Is there a separate budgetary line item for laboratory services?	

6. Is there a separate budgetary line item for laboratory supplies (reagents and consumables)?
7. Is there a separate budgetary line item for laboratory equipment?
Comments:

Section VI. Storage and Distribution

1. Is there a central level store for laboratory supplies and equipment? (*Specify by program.*)
2. Is the existing storage capacity adequate to handle the required quantities of laboratory supplies at the national (or intermediate, if no national) level?
3. Is the existing cold storage capacity adequate to handle the current quantities of cold chain reagents at the national (or intermediate, if no national) level?
4. Are there adequately refrigerated vehicles to distribute cold chain reagents to sites?
5. Is the existing storage capacity (including cold chain) adequate to handle the expanded program goals for the next three years? If no, specify what is inadequate and what is done alternatively.
6. Is there an established distribution system for laboratory supplies and equipment for all levels?
7. Describe the current system for distributing laboratory supplies (reagents and consumables) and equipment to all levels:

8. Are there a sufficient number of functioning vehicles available to meet the distribution schedule at the following levels?
a. Central
b. Regional
c. District
d. Health centers (HCs)
Comments:

Section VII. Inventory Control System

1. Do laboratories at all levels have a set minimum stock level for reagents and consumables? (If no, go to question 4.)
2. How often is the stock level for reagents and supplies reviewed?
3. What action is taken after stock levels for reagents and supplies have been reviewed?
4. Do laboratories at all levels have a set maximum stock level for reagents and consumables above which the inventory level should not go?
5. Who determines resupply quantities to fill orders?
6. Are stock balances at all levels monitored regularly so that procurement decisions and actions can be made on time to avoid stockouts or overstocks? (*Specify any program differences.*)
7. Are damaged/expired products physically separated from inventory and removed from stock records?
8. Does the higher/intermediate level need to reconstitute some reagents so they are ready to use at the lower levels? If yes, specify why:

Comments:

Section VIII. Laboratory Services Management Information System

1. Are there standard national forms available and used to collect and report information on laboratory services? Specify the form names.
2. Do the forms include the following data:
a. Number of laboratory tests requested and/or conducted?
b. Logistics data (stock on hand, consumption, losses and adjustments, quantity ordered or requested)?
c. Equipment status?
d. Other data? (*specify*)
3. Describe the reporting system in detail, including the reporting level, the information reported, and the reporting frequency (monthly, bimonthly, quarterly).
4. Approximately what percentage of districts and what percentage of laboratories submit these reports each reporting period, according to the schedule? _____ % of districts _____ % of laboratories
5. How do managers monitor reporting rates and follow up to obtain missing reports?

6. What decisions are based on information received in the reports?
7. Are laboratory registers and results log books for recording test results standardized nationally?
8. Is this system integrated with the MOH health management information system?
Comments:

Section IX. Supervision

1. Is there a designated person to provide supportive supervision at each level (national, provincial/regional, and district)?
2. Is scheduled laboratory supervision conducted at the following levels? If so, how often?
a. National reference laboratories?
b. Provincial or regional laboratories?
c. District laboratories?
d. HC laboratories?
e. Private sector laboratories?
3. What activities are routinely conducted during the supervisory visit? Is there a standard supervision checklist or protocol? If yes, please provide a copy.
4. Is there a mechanism to monitor the performance of the supply chain for laboratory reagents and consumables? If so, please describe.
Comments:

Section X. General Questions

1. What are the major areas of concern for laboratory services at the national level?
2. How can these areas of concern be addressed nationally?

Facility Level Questionnaire

General Information

1. Unique identifier:		
2. GPS coordinates:		
3. Name of interviewer:		
4. Today's date (dd/mm/yyyy):		
5. Name and title of person being interviewed:		
6. Time worked in facility:	Years……Months……	
7. Name of head of facility:		
8. Name of facility:		
9. Region:		
10. District:		
11. Level of the facility:	☐ Regional hospital ☐ District hospital	☐ HC ☐ Other_____
12. Type of facility:	☐ Government ☐ Private not-for-profit ☐ Other (*specify*)_____	
13. Facility telephone: Mobile phone:		
14. Email:		
15. General notes:		

Section I. National Guidelines and Protocols

1. Are national guidelines and protocols for laboratory testing procedures available in this laboratory? *Check for these and other procedures inquired on below, physically.* If respondent said "yes" but written guidelines cannot be produced indicate "not available."	☐ Yes ☐ No ☐ Don't know/not sure ☐ Not available
2. Who is responsible for the implementation of laboratory testing procedures at this facility?	☐ Laboratory director ☐ National Reference Laboratory ☐ Expert advisory committee ☐ Other……
3. Who informs you of revisions in national guidelines?	☐ Laboratory director ☐ National Reference Laboratory ☐ Expert advisory committee ☐ Other……
4. Are written guidelines on safety precautions available in this laboratory? (*Check all that apply.*)	☐ Infection prevention ☐ Safe disposal of sharps (i.e., needles, etc.) ☐ Safe disposal of biohazardous medical waste ☐ Use of protective gear ☐ Other (*specify*): …….. ☐ Not available
5. Are written guidelines for specimen referral available in this laboratory?	☐ Yes ☐ No ☐ Don't know/not sure ☐ Not available
6. Are written guidelines for laboratory waste management available in this laboratory?	☐ Yes ☐ No ☐ Don't know/not sure ☐ Not available
7. Are written guidelines for disposal or destruction of damaged and/or expired products available in this laboratory?	☐ Yes ☐ No ☐ Don't know/not sure ☐ Not available
8. Are written guidelines for storage of laboratory products available in this laboratory?	☐ Yes ☐ No ☐ Don't know /not sure ☐ Not available

9. Are written guidelines for the service and maintenance of equipment used in this laboratory available?	☐ Yes ☐ No ☐ Don't know /not sure ☐ Not available
10. Are the national SOPs for the laboratory logistics system available in this laboratory?	☐ Yes ☐ No ☐ Don't know/not sure ☐ Not available
11. Are there national guidelines on what to do when "out of standard equipment" is offered/delivered to a laboratory?	☐ Yes ☐ No ☐ Don't know/not sure ☐ Not available
Comments:	

Section II. Laboratory Personnel

1. Indicate the current working staff at this facility by the following category:				
	Posts	In-post	Number who have attended laboratory refresher training in the past 12 months	Number who have received training in logistics
Laboratory scientific officer				
Laboratory technologist				
Laboratory technician				
Laboratory assistants				
Laboratory attendants				
Microscopists				
Other				
2. When did this laboratory receive the last supervisory visit?			☐ Never (Go to question 5) ☐ Within the last month ☐ More than one month but under three months ago ☐ More than three months but under six months ago ☐ More than six months ago	
3. Who conducted the supervision?				
4. Did the supervision focus on laboratory services for one program or multiple programs?			☐ One program ☐ Multiple programs ☐ Don't know/not sure	
5. What programs were covered during the supervision? (Check all that apply.)			☐ Malaria ☐ STI ☐ HIV and AIDS ☐ TB ☐ None ☐ Other (*specify*): ……	

6. What activities were conducted during the supervisory visit?	☐ Infrastructure inspected ☐ Equipment inspected ☐ Reinforcement of universal safety precautions ☐ Record keeping of performed tests checked ☐ Equipment maintenance records checked ☐ Cold chain records checked ☐ Stockcards, stock ledger, and/or reports checked ☐ Quality control records checked ☐ On-the-job training/coaching ☐ Provide feedback to staff ☐ Receive feedback from staff ☐ Other (*specify*): ……
Comments:	

Section III. Laboratory Testing Services

Part A. Tests Performed at Laboratory

In the first column, check the laboratory tests that are performed by the laboratory. In the second column, select the technique the laboratory is using to carry out the test. If test is currently unavailable, select the reason for not testing at the time of the assessment.

Tests Performed at Laboratory			
Laboratory Test	**Technique**	**Test Currently Available**	**Reason for Not Testing**
Rapid HIV (screening)	☐ SD Bioline ☐ Determine ☐ iNsti ☐ Other (*specify*):	☐ Yes ☐ No	☐ No reagents ☐ Equipment not functioning ☐ No equipment ☐ Staff not trained ☐ Test not requested
Rapid HIV (confirmatory)	☐ SD Bioline ☐ Determine ☐ iNsti ☐ Other (*specify*): ..... ☐	☐ Yes ☐ No	☐ No reagents ☐ Equipment not functioning ☐ No equipment ☐ Staff not trained ☐ Test not requested
Rapid HIV (tie breaker)	☐ SD Bioline ☐ Determine ☐ iNsti ☐ Other (*specify*): ..... ☐	☐ Yes ☐ No	☐ No reagents ☐ Equipment not functioning ☐ No equipment ☐ Staff not trained ☐ Test not requested
Malaria	☐ Giemsa stain ☐ Leishman fluid ☐ Other (*specify*):	☐ Yes ☐ No	☐ No reagents ☐ Equipment not functioning ☐ No equipment ☐ Staff not trained ☐ Test not requested
Sputum for acid-fast bacillus	☐ Ziehl-Neelsen (ZN) stain ☐ Fluorescent ☐ Culture	☐ Yes ☐ No	☐ No reagents ☐ Equipment not functioning ☐ No equipment ☐ Staff not trained ☐ Test not requested

Tests Performed at Laboratory			
Laboratory Test	**Technique**	**Test Currently Available**	**Reason for Not Testing**
Stool microscopy	☐ Direct saline, iodine	☐ Yes ☐ No	☐ No reagents ☐ Equipment not functioning ☐ No equipment ☐ Staff not trained ☐ Test not requested
Urine microscopy	☐ Direct microscopy	☐ Yes ☐ No	☐ No reagents ☐ Equipment not functioning ☐ No equipment ☐ Staff not trained ☐ Test not requested
Syphilis screening	☐ Rapid plasma regain (RPR) ☐ Other	☐ Yes ☐ No	☐ No reagents ☐ Equipment not functioning ☐ No equipment ☐ Staff not trained ☐ Test not requested
Full blood count	☐ Sysmex KX –21N ☐ Sysmex PoChi ☐ Sysmex XT1800 ☐ Sysmex XT2000i ☐ Other (*specify*): ..... ☐	☐ Yes ☐ No	☐ No reagents ☐ Equipment not functioning ☐ No equipment ☐ Staff not trained ☐ Test not requested
Electrolytes	☐ ISE ☐ Flame photometry ☐ Other (*specify*): ..... ☐	☐ Yes ☐ No	☐ No reagents ☐ Equipment not functioning ☐ No equipment ☐ Staff not trained ☐ Test not requested
Chemistry	☐ Automated ☐ Manual	☐ Yes ☐ No	☐ No reagents ☐ Equipment not functioning ☐ No equipment ☐ Staff not trained ☐ Test not requested

Part B. Specimen Referral

1. Do you routinely refer specimens for tests that are NOT performed in this laboratory to other laboratories (If no, go to 6.)	☐ Yes ☐ No
2. Where does the laboratory refer these specimens? (Note name of the referral laboratory.)	☐ National Reference laboratory ☐ Central hospital laboratory ☐ Provincial hospital laboratory ☐ District hospital laboratory ☐ HC laboratory ☐ Indicate name of referral laboratory: ☐ …….
3. What type of specimens does this laboratory routinely refer? (Check all that apply.)	☐ Blood ☐ Sputum ☐ Urine ☐ Stool ☐ Swabs ☐ Biopsy ☐ Other…….
4. What type of tests does this laboratory routinely refer? (Check all that apply.)	☐ EID polymerase chain reaction (PCR) ☐ TB culture ☐ CD4 ☐ Viral load ☐ Histology ☐ Chemistry ☐ Hematology
5. How long does it take for this laboratory to receive the results for the routinely referred specimens?	☐ One day ☐ Two days to a week ☐ More than a week but less than two weeks ☐ Two weeks or greater
6. Does this laboratory sometimes refer specimens for tests that it should be providing?	☐ Yes ☐ No ☐ If no, end here.
7. What are the reasons for referral of these specimens?	☐ No reagents ☐ No staff ☐ Broken equipment ☐ Other
8. Are specimen referral guidelines available in this laboratory?	☐ Yes ☐ No

9. Are specimen packaging guidelines available in this laboratory?	☐ Yes ☐ No
10. Is there a specimen referral register in this laboratory? (Ask to see the register and note the information recorded.)	☐ Yes ☐ No
11. How are the test results of the specimens referred communicated to this laboratory?	☐ Facility transport ☐ Post ☐ Courier ☐ Fax/Phone ☐ Email ☐ SMS/texting
12. Does this laboratory keep a record of the test results of referred specimens?	☐ Yes ☐ No
13. Are patients notified when results are received from the referral laboratory? If NO, how do patients receive the test results of referred specimens?	☐ Yes ☐ No
14. How long does it take the laboratory to receive the results for ad hoc sample referrals?	☐ One day ☐ Two days to one week ☐ More than a week
15. Does the laboratory have supplies for collecting specimens for referral?	☐ Yes ☐ No
16. How does the laboratory obtain supplies for specimen collection?	☐ Donor provided ☐ Purchased with own budget ☐ Provided through central medical ☐ stores ☐ Other (*specify*)……
17. Does this laboratory receive specimens from other laboratories or health facilities?	☐ Yes ☐ No
18. Is there a register for specimens received from other laboratories or health facilities?	☐ Yes ☐ No
19. How do facilities that refer specimens to this laboratory receive their results?	☐ Referring laboratory collects ☐ This laboratory sends result to referring facility
20. What is the average turnaround time for sending results on referred specimens?	☐ One day ☐ Two days to a week ☐ More than a week but less than two weeks ☐ Two weeks

Comments:

Section IV. Quality Assurance

1. Are there written quality assurance policies and procedures available in this laboratory?	☐ Yes ☐ No ☐ Don't know/not sure
2. Does the laboratory undertake the following internal quality control procedures (*check all physically*):	
a. Daily record refrigerator temperature charts.	☐ Yes ☐ No
b. Daily record freezer temperature charts.	☐ Yes ☐ No
c. Include commercially prepared controls whenever a batch of tests is run?	☐ Yes ☐ No ☐
3. Does the laboratory have guidelines for handling cold chain products that have been exposed to higher temperatures? (For example, by sitting outside for a while or after a relatively long power outage.)	☐ Yes ☐ No ☐ Don't know/not sure
4. Does the laboratory prepare in house controls for quality control testing?	☐ Yes ☐ No
5. Does the laboratory participate in any external quality assurance scheme?	☐ Yes ☐ No
6. If yes, which scheme? _____ How often in a year? _____ With which program? _____	
Comments:	

Section V. Waste Management

1. Does the laboratory have waste management guidelines in place?	☐ Yes ☐ No
2. Does the laboratory separate infectious waste from general trash?	☐ Yes ☐ No
3. Is infectious waste contained in clearly marked bags or receptacles such as a red bag or a container marked with a biohazard symbol?	☐ Yes ☐ No
4. Does the laboratory have a functioning incinerator or other nationally acceptable waste management method (e.g., a protected pit) to correctly dispose of all hazardous materials (e.g., needles, toxic materials)?	☐ Yes ☐ No
5. Are there guidelines for the removal/disposal of obsolete laboratory equipment available in this laboratory?	☐ Yes ☐ No
6. Is there any obsolete equipment currently being stored in the laboratory?	☐ Yes ☐ No
7. Does the laboratory have adequate packaging materials for the transportation of infectious materials from the laboratory?	☐ Yes ☐ No
8. Does the laboratory have guidelines on the management of spillages available in laboratory?	☐ Yes ☐ No
Comments:	

Section VI. Logistics Management of Laboratory Supplies

Part A. Inventory Management

1. Does the laboratory have a set minimum stock level for reagents and consumables?	☐ Yes ☐ No (Go to question 3) ☐ Don't know/not sure
2. How often is the stock level of reagents and supplies reviewed?	☐ Each time an issue is made ☐ Monthly ☐ Every two months ☐ Quarterly ☐ Other ☐ Never
3. Does the laboratory have a set maximum stock level for reagents and consumables above which the inventory level should not go?	☐ Yes ☐ No ☐ Don't know/not sure
4. How often is a physical inventory of reagents and consumable supplies conducted in the laboratory?	☐ Monthly ☐ Every two months ☐ Quarterly ☐ Other ☐ Never
5. In your current system, do some reagents need to be reconstituted at the regional or district level as ready to use for HCs?	☐ Yes (specify below) ☐ No ☐ Don't know/not sure
6. If yes to question 5, please specify why:	☐ Lack of technical expertise ☐ Lack of equipment ☐ Cost considerations ☐ Policy
Comments:	

Part B. Logistics Management Information System

1. What forms does the laboratory use to keep track of reagents and consumables in stock? DO NOT READ LIST. PROMPT "ANYTHING ELSE?" (Check all that apply and verify.)	☐ Stock cards ☐ Store Ledgers ☐ Other (*specify*): ……. ☐ None
2. What forms does the laboratory use for ordering supplies? DO NOT READ LIST. PROMPT "ANYTHING ELSE?" (Check all that apply and verify.)	☐ Order book ☐ Delivery note ☐ Requisition and Issue voucher ☐ Other (*specify*): …….
3. What forms does the laboratory use for receiving supplies?	☐ Delivery note ☐ Requisition and issue voucher ☐ Other (*specify*): …….
4. Who determines how much to order?	☐ Laboratory ☐ Higher level authorities
If the general stores (or pharmacy) of a hospital orders laboratory reagents, ask the hospital store questions 5–12.	
5. Which data elements do you use to calculate how much to order? DO NOT READ LIST. PROMPT "ANYTHING ELSE?" (Check all that apply.)	☐ Average monthly consumption ☐ Number of tests performed ☐ Stock remaining in the laboratory ☐ Set maximum stock level for reagents ☐ Other (*specify*): ……. ☐ Don't know/not sure
6. Where does this facility send its order for resupply? (Check all that apply.)	☐ National medical stores ☐ Regional medical stores ☐ District medical stores ☐ Private supplier/open market ☐ Other (*specify*): …….
7. How often do you place orders?	☐ Monthly ☐ Quarterly ☐ Every six months ☐ Other (*specify*): …….
8. How many emergency orders have you placed in the last year?	☐ Number: …….

9. Under normal circumstances, how long does it take from the time you place an order to the time the supplies are received and available for use?	☐ _____ days ☐ _____ months ☐ Don't know/not sure
10. In the last year, did you have an order that took longer than usual to fill?	☐ Yes ☐ No (Go to question 13) ☐ Don't know/not sure (Go to question 13)
11. For this order, how long did it take you to receive your supplies from the time of order?	☐ _____ days ☐ _____ months
12. What were the reasons for the delay in receiving the supplies?	☐ Supplies unavailable in country ☐ No funding ☐ Supplier failed to supply ☐ Wrong product supplied ☐ Other (*specify*): …….
13. Does the laboratory have standard preprinted test requests and reporting forms?	☐ Yes ☐ No ☐ Don't know/not sure
14. If NO to question 13, what supports or forms are used for lab test requests and test results recording? (Specify.)	
15. Does this laboratory send reports on the following: (Read list and check all positive responses.)	☐ Stock on hand ☐ Consumption ☐ Lab tests performed ☐ Surveillance reports ☐ Other (*specify*): ……
16. How often are these reports sent? (Check all that apply.)	☐ Monthly ☐ Every two months ☐ Quarterly ☐ Other (*specify*): ……
17. Where are these reports sent? (Read list and check all positive responses.)	☐ To the central laboratory coordinator ☐ To the regional laboratory coordinator ☐ To the district laboratory focal person ☐ Other (*specify*): ……

18. How are the reports sent?	☐ Facility transport ☐ Post ☐ Courier ☐ Fax/phone ☐ Email ☐ SMS text
19. Is the LMIS integrated with the laboratory management information system?	☐ Yes ☐ No ☐ Don't know/not sure
Comments:	

Part C. Transport

1. Do all of the laboratory supplies come from the same source?	☐ Yes ☐ No
2. Is the distribution of laboratory supplies integrated across all programs?	☐ Yes ☐ No
a. Explain which program's products (e.g., HIV and AIDS, TB, malaria, etc.) are distributed together and which are distributed separately.	
3. How do lab supplies usually arrive at the laboratory? DO NOT READ LIST. Specify any differences for vertical programs (e.g., HIV and AIDS, TB).	☐ Laboratory picks them up ☐ Higher level (e.g., district, regional) delivers them ☐ National medical store delivers them ☐ Private supplier delivers them ☐ Other (*specify*): ……..
4. Does the laboratory have access to a vehicle?	☐ Yes ☐ No
5. Does the laboratory use the vehicle to pick up supplies?	☐ Yes ☐ No
6. What are the major problems you have experienced related to transport in the last year?	a. _____ b. _____ c. _____
Comments:	

Part D. Input for System Design

1. How often do you think you should reorder your supplies to ensure an adequate stock at all times?	☐ Monthly ☐ Bimonthly ☐ Quarterly ☐ Other (*specify*): ……
2. What would be the best way to obtain supplies for your laboratory?	☐ Your facility picks them up ☐ Higher level delivers them ☐ Other (specify): ……
3. What would be the best way to monitor usage of laboratory reagents that are not quantifiable per whole unit or per test (e.g., reagents in liquid form)?	
4. What is the shortest shelf life of the laboratory reagents you are currently handling? (If it is one of the controls, what is the shortest shelf life for the reagents?)	
5. How are controls (including biological controls) currently ordered/distributed/managed?	
6. How is the system supplying the controls working?	
7. How would you improve the system?	
Comments:	

Part E. Availability of Sample Reagents and Infection Control Commodities

Sample Reagents	Stockout on Day of the Visit	Stockout in the Last 30 Days (Not Including Day of Visit)
Field stain A	☐ Yes ☐ No	☐ Yes ☐ No
Field stain B	☐ Yes ☐ No	☐ Yes ☐ No
Gram stain	☐ Yes ☐ No	☐ Yes ☐ No
ZN stain	☐ Yes ☐ No	☐ Yes ☐ No
Sodium chloride	☐ Yes ☐ No	☐ Yes ☐ No
RPR antigen	☐ Yes ☐ No	☐ Yes ☐ No
Immersion oil	☐ Yes ☐ No	☐ Yes ☐ No
Uristix	☐ Yes ☐ No	☐ Yes ☐ No
Methanol	☐ Yes ☐ No	☐ Yes ☐ No
Xylene	☐ Yes ☐ No	☐ Yes ☐ No
HIV screening test kit	☐ Yes ☐ No	☐ Yes ☐ No
HIV confirmatory test kit	☐ Yes ☐ No	☐ Yes ☐ No
HIV tie-breaker test kit	☐ Yes ☐ No	☐ Yes ☐ No
Blood group/type antisera	☐ Yes ☐ No	☐ Yes ☐ No
Acetic acid, glacial	☐ Yes ☐ No	☐ Yes ☐ No

Field stain A reagent	☐ Yes ☐ No	☐ Yes ☐ No
Field stain B reagent	☐ Yes ☐ No	☐ Yes ☐ No
Gram stain reagent	☐ Yes ☐ No	☐ Yes ☐ No
ZN stain reagent	☐ Yes ☐ No	☐ Yes ☐ No
Sodium chloride reagent	☐ Yes ☐ No	☐ Yes ☐ No
Formalin, solution	☐ Yes ☐ No	☐ Yes ☐ No
Ether	☐ Yes ☐ No	☐ Yes ☐ No
India ink	☐ Yes ☐ No	☐ Yes ☐ No
Potassium hydroxide, reagent	☐ Yes ☐ No	☐ Yes ☐ No
Pregnancy test kit	☐ Yes ☐ No	☐ Yes ☐ No
Infection Control		
Gloves latex disposable	☐ Yes ☐ No	☐ Yes ☐ No
Goggles	☐ Yes ☐ No	☐ Yes ☐ No
Masks	☐ Yes ☐ No	☐ Yes ☐ No
Biohazard bags	☐ Yes ☐ No	☐ Yes ☐ No
Disinfectants	☐ Yes ☐ No	☐ Yes ☐ No
Sharps boxes	☐ Yes ☐ No	☐ Yes ☐ No

Part F. Storage

Inspect the storage area of the laboratory for questions 1–5. Write the relevant comments in the space provided.		
Storage Conditions	**Response**	**Comments**
1. Are there written guidelines for storing laboratory supplies according to their specifications (flammable, caustic, etc.; e.g., *Are Material Safety Data Sheets available*)?	☐ Yes ☐ No ☐ Don't know	
2. Are flammable and hazardous chemicals stored in specialized storage areas?	☐ Yes ☐ No ☐ Don't know	
3. Are reagents stored according to first-to-expire, first-out practice in the laboratory?	☐ Yes ☐ No ☐ Don't know	
For questions 4–6, if no damaged or expired products are evident, ask the stockkeeper to explain the accepted practice for such products. Verify the practice to the extent possible.		
4. Does the laboratory separate damaged and/or expired supplies from good products?	☐ Yes ☐ No ☐ Don't know	
5. Does the laboratory make it a practice to follow guidelines for the disposal and/or destruction of damaged and/or expired laboratory supplies?	☐ Yes ☐ No ☐ Don't know	
6. Are cold chain items always stored at appropriate temperatures? If not, list cold chain items and how they were found.	☐ Yes ☐ No ☐ Don't know	
7. Have there been any problems with the storage of laboratory supplies?	☐ Yes ☐ No	
8. If yes, list the three major problems with storing laboratory supplies? (*Start with the highest priority.*)	a. _____ b. _____ c. _____	

Comments:

Section VII. Equipment Availability and Maintenance

Part A. Automated Analyzers

Name and Model of Machine	Equipment Working	Service Contract	Machine Log book Up-to-date	Maintenance Schedule Available	Local Agent Available	User Manual Available	Handling of Repairs
Chemistry							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No ☐	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call supplier ☐ Call local agent ☐ Other……
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No ☐	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call supplier ☐ Call local agent ☐ Other……
CD4							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call supplier ☐ Call local agent ☐ Other……
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call supplier ☐ Call local agent ☐ Other……
Hematology							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call supplier ☐ Call local agent ☐ Other……
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call supplier ☐ Call local agent ☐ Other……

Part B. General Laboratory Equipment Available

Name and Model of Machine	Equipment Working	Service Contract	Hospital Equipment Technician can Service	Maintenance Schedule Available	Local Agent Available	Periodic Calibration Checks Recorded	Handling of Repairs
Balances							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No ☐	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
Centrifuges							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician

Name and Model of Machine	Equipment Working	Service Contract	Hospital Equipment Technician can Service	Maintenance Schedule Available	Local Agent Available	Periodic Calibration Checks Recorded	Handling of Repairs
							☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
Micropipettes							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent

Name and Model of Machine	Equipment Working	Service Contract	Hospital Equipment Technician can Service	Maintenance Schedule Available	Local Agent Available	Periodic Calibration Checks Recorded	Handling of Repairs
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
Autoclaves							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
Refrigerators							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician

Name and Model of Machine	Equipment Working	Service Contract	Hospital Equipment Technician can Service	Maintenance Schedule Available	Local Agent Available	Periodic Calibration Checks Recorded	Handling of Repairs
							☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
Freezers							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
Rockers							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer

Name and Model of Machine	Equipment Working	Service Contract	Hospital Equipment Technician can Service	Maintenance Schedule Available	Local Agent Available	Periodic Calibration Checks Recorded	Handling of Repairs
							☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
Shakers							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
Microscopes							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer

Name and Model of Machine	Equipment Working	Service Contract	Hospital Equipment Technician can Service	Maintenance Schedule Available	Local Agent Available	Periodic Calibration Checks Recorded	Handling of Repairs
							☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
Safety Cabinets							
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Call hospital ☐ technician ☐ Call manufacturer ☐ Call local agent

Part C. Equipment Gaps

Does the facility have a notable equipment gap? If so please indicate which equipment in the column on the left and the reason why in the column on the right.

Needed Equipment Type and Generic Specifications	Reason for Equipment Gap
	☐ Facility never had this equipment ☐ Replace obsolete equipment ☐ Backup to existing equipment ☐ Current equipment has inadequate capacity
	☐ Facility never had this equipment ☐ Replace obsolete equipment ☐ Backup to existing equipment ☐ Current equipment has inadequate capacity
	☐ Facility never had this equipment ☐ Replace obsolete equipment ☐ Backup to existing equipment ☐ Current equipment has inadequate capacity
	☐ Facility never had this equipment ☐ Replace obsolete equipment ☐ Backup to existing equipment ☐ Current equipment has inadequate capacity

Section VIII. Laboratory Infrastructure

Laboratory Layout		
Type of Room	**Available**	**Comments**
Stand-alone laboratory	☐ Yes ☐ No	
Main laboratory room	☐ Yes ☐ No	
Blood donation room	☐ Yes ☐ No	
Sluice	☐ Yes ☐ No	
Store (reagents and supplies)	☐ Yes ☐ No	
Storage for flammables	☐ Yes ☐ No	
Office for head of laboratory	☐ Yes ☐ No	
Reception/specimen collection area	☐ Yes ☐ No	
Records area	☐ Yes ☐ No	
Staff resting area	☐ Yes ☐ No	
Specimen preparation	☐ Yes ☐ No	
Patient waiting area	☐ Yes ☐ No	
Immunology laboratory	☐ Yes ☐ No	
Biochemistry laboratory	☐ Yes ☐ No	
Hematology laboratory	☐ Yes ☐ No	
PCR laboratory	☐ Yes ☐ No	

Interviewer's Guide to Inspecting the Laboratory Area

If the answer for any of the questions is no, describe the status of the area in the comments box.

- Question 10: Note that the incinerator should be functioning and used to destroy all hazardous waste.
- Identify any areas in need of improvement and the type of improvement needed and note in the comments box.

Laboratory Area	Yes	No	Comments
1. Is the laboratory area maintained in good condition (e.g., clean, all trash removed, shelves are sturdy, etc.)?			
2. Is the laboratory secured with a lock and key but accessible during normal working hours?			
3. Does the laboratory have shelves and lockable cupboards; access that is limited to authorized personnel?			
4. Does the laboratory have sufficient space to adequately store existing supplies?			
5. Does the laboratory have:			
a. Running water?			
b. Access to filtered rainwater (for HC only)?			
c. Distilled or deionizer water?			
6. Does the laboratory have a consistent power supply and/or a generator with a guaranteed supply of petrol or solar power?			(Record average number of hours per day electric power is available.)
7. Does the laboratory have an adequate number of power points (sockets)?			
8. Does the laboratory have separate sinks for washing laboratory ware and staining, and for washing hands after being exposed to infected materials?			
9. Does the laboratory have drainage from laboratory sinks that are closed and that lead to either a septic tank or deep pit?			
10. Does the laboratory have a *functioning* incinerator or other nationally acceptable waste management method (e.g., a protected pit) to correctly dispose of all hazardous waste?			
11. Are the laboratory floors in good condition without the need for repair?			
12. Is the roof maintained in good condition at all times to avoid sunlight and water penetration?			
13. Are the internal walls in good condition without the need for repair?			

Laboratory Area	Yes	No	Comments
14. Are the external walls in good condition without the need for repair?			
15. Is the laboratory well lit?			
16. Is the laboratory well ventilated and cross-ventilated?			
17. Are the windows and doors in good condition without the need for replacement or repair?			
18. Does the laboratory have firm built-in benches with leveled tops in good condition?			
19. Does the laboratory have firm shelves to store supplies and reagents?			
20. Is there adequate glassware and/or plastic ware to carry out all required testing in the laboratory?			
21. Do the windows have security bars?			
22. Are there an adequate number of laboratory stools?			
23. Does the laboratory have an indoor patient waiting area with seats?			
24. Do the laboratory staff have access to clean toilet facilities?			
25. Do the laboratory staff have access to safe drinking water supply?			
26. Does the laboratory have a working fire extinguisher?			
Comments:			

Additional Resources

John Snow, Inc./DELIVER. 2005. *Logistics Indicators Assessment Tool (LIAT).* Arlington, Va.: John Snow, Inc./DELIVER, for the U.S. Agency for International Development.

John Snow, Inc./DELIVER. 2005. *Logistics System Assessment Tool (LSAT).* Arlington, Va.: John Snow, Inc./DELIVER, for the U.S. Agency for International Development.

John Snow, Inc./ AIDS/HIV Integrated Model District Program (AIM). 2003. *Report on Physical Assessment of Laboratory Infrastructure and Counselling Rooms in the AIM Supported Districts*. Kampala, Uganda: John Snow, Inc./AIM, for the U.S. Agency for International Development and the Centers for Disease Control and Prevention.

Ministry of Health (MOH) Uganda and African Medical Research Foundation (AMREF). 1994. *National Policy Guidelines for the Health Laboratory Services of Uganda.* Kampala, Uganda: MOH, Uganda, and AMREF.

For more information, please visit deliver.jsi.com.

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