



# AMR LCI

Antimicrobial Resistance Laboratory-  
Clinical Interface Scorecard

## USER GUIDE

Assuring effective use of AMR-  
related laboratory data for patient  
management and surveillance

VERSION 1.3 – SEPTEMBER 2021

IN PARTNERSHIP WITH





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## Acronyms & Abbreviations

AMR	Antimicrobial Resistance
AMS	Antibiotic Stewardship
ASC	Antibiotic Stewardship Committee
AST	Antimicrobial susceptibility testing
GLASS	Global Antimicrobial Resistance Surveillance System
HAI	Hospital-acquired infection
ICC	Infection Control Committee
ICU	Intensive Care Unit
IPC	Infection Prevention and Control
LCI	Laboratory Clinical Interface
WHO	World Health Organization

## Target audience

This Guide, the Antimicrobial Resistance (AMR) Laboratory Clinical Interface (AMR LCI) Scorecard and the companion AMR Laboratory Scorecard and User Guide is intended to inform Ministries of Health officials, health facility and laboratory managers, donors, implementing partners, quality assurance personnel, programme managers and supervisory staff at national, regional and facility level on requirements for delivering quality-assured laboratory testing for AMR and ensuring effective use of laboratory data for patient management and surveillance in low and middle income settings.

## Acknowledgements

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## 1. Background & rationale

The indiscriminate use, inappropriate and inadequate prescription of antibiotics, both in the human and animal health sectors, are primary contributing factors to the rapid increase of Antimicrobial Resistance (AMR) worldwide [1]. AMR poses a serious challenge in global public health due to ineffective disease treatment options [2]. AMR is estimated to account for more than 700,000 deaths worldwide [1]. Successful treatment outcomes are significantly reduced due to the threat of rapidly increasing resistance of organisms to many antibiotics used in the treatment of infectious disease (3). Recent reviews of AMR data from Africa have found a high level of resistance to commonly used antibiotics in the region [2,3,4]. The O'Neill report [2] highlights global gaps in surveillance, standardized procedures and data management. Concerning is the lack of quality AMR data from many low- and middle-income countries.

The primary function of any clinical facility is to provide quality care for all patients from diagnosis to treatment. With regards to addressing the risk of AMR, the clinical facility has the responsibility to implement infection control measures to prevent hospital acquired (HAI) or community-acquired infections from occurring and spreading and to optimizing the appropriate use of antimicrobials to treat infections by applying evidence-based practices (Antimicrobial Stewardship [AMS]).

The aim of the AMR LCI Scorecard is to assess the availability and effective use of AMR-related laboratory data for patient management and surveillance, as a component of the overarching AMS practices at a facility, which may include, in addition to the activities covered by this scorecard, infection prevention and control (IPC) practices at a department / ward level.

The AMR LCI Scorecard which the guide describes should be used by assessors to establish gaps in availability and quality of laboratory testing and use of laboratory results to inform AMS & IPC practices in the patient diagnostic pathway. These gaps should be addressed through targeted interventions, and the progress and impact of those interventions should be routinely monitored to enable continuous quality improvement along the diagnostic pathway.

## 2. Planning the assessment

Assessment of the clinical facility using the AMR LCI Scorecard requires a multi-disciplinary team as the findings of the assessment apply to both the clinical facility and laboratory and the interface between the two. The assessment should be used to build a cross-disciplinary culture, which is a key component for improving the laboratory clinical interface. The multi-disciplinary team should representation from the laboratory (e.g. Laboratory Head, or senior technologist), a clinical microbiologist (if available) and a clinician with experience in AMS. Ideally the team should be led by an assessor familiar with both the laboratory and clinical environments.

To identify the most critical departments / wards to be assessed should be determined in conjunction with the clinical facility management. Prior arrangements and notification to department heads / ward managers will facilitate the assessment. The following should be taken into account when choosing the departments / wards to be assessed:

1. Number of assessors available to perform the assessment;
2. Time available to perform the assessment(s) (see Scheduling);
3. Departments/wards frequently using antibiotics (e.g. Intensive Care Units [ICU]);
4. Departments/wards associated with HAI or nosocomial outbreaks (e.g. Neonatal ICU) including Alert organisms;

5. Departments/wards most frequently requesting blood, urine or feces culture.

## Scheduling

This assessment is estimated to take approximately four hours to complete depending on the size and complexity of the clinical facility and the number of departments to be included in the assessment. Prior arrangement with the clinical facility management to access the facility-level documents can greatly reduce the time on-site and is highly recommended if a large facility / many wards or departments are being assessed.

## 3. Conducting the assessment

Assessments are an effective means to:

1. Determine if the clinical facility has appropriate guidelines in place for use of AMR-related tests and that departments/wards are following those guidelines, including test selection and sample collection.
2. Determine if AMR-related laboratory results are being reported and used effectively for clinical management and surveillance.
3. Identify areas for improvement in interactions between laboratory and clinical staff that impact effective use of laboratory testing and quality of patient care.

Assessors should complete the assessment scorecards using the methods below to evaluate operations as per the scorecard questions and document detailed findings including:

1. Review the facility level documents to verify that policies, treatment or prescriber guidelines and other documentation are complete, current, accurate, and meet international best practices.
2. Assess whether the above documents are available at departments/wards being assessed and understood by clinical staff.
3. Review patient records and other relevant documents to verify that AMR policies are being followed, for example ordering of laboratory tests where indicated, prescription review following test results.
4. Observe sample collection and transport procedure to ensure that:
  - a. The departments and wards are following the clinical facility written policies and procedures regards sample requisition, collection and transport.
  - b. The departments and wards are following the clinical facility written policies and procedures regards use of laboratory data to inform patient management.

During the assessment, assessors should:

1. Ask open-ended questions to clarify documentation seen and observations made. Ask questions like, "show me how..." or "tell me about..." It is often not necessary to ask all the scorecard questions verbatim. An experienced assessor can often answer multiple checklist questions through open-ended questions.
2. Evaluate the quality and efficiency of supporting work areas (e.g., phlebotomy, data registration and reception, messengers, drivers, cleaners and IT) as part of the assessment.
3. Observe urine, feces and blood specimen collection and transport to determine the appropriateness of the clinical facility systems and operations.

## Scoring the assessment

The AMR Lab Scorecard and AMR LCI Scorecard use the same scoring convention. Each item has been awarded a point value of 2, 3, or 5 points—based upon relative importance and/or complexity. Responses to all questions are rated as, “yes”, “partial”, or “no”: - Items marked “yes” receive the corresponding point value (2, 3, or 5 points). All elements of a question must be present in order to indicate “yes” for a given item and thus award the corresponding points.

NOTE: items that include “tick lists” must receive all “Yes” and/or “NA” responses to be marked “Yes” for the overarching item.

- Items marked “partial” receive 1 point.
- Items marked “no” receive 0 points.
- When marking “partial” or “no”, notes should be written in the comments field to explain why the item was not fulfilled.

Where the checklist question does not apply, indicate as “NA”. Subtract the sum of the scores of all questions marked “NA” and subtract that sum of “NAs” from the total of the section.

## 4. The AMR LCI Scorecard

### A. Score

This section summarizes the scores for the assessment. Assessors should note the date of the assessment and the date of the previous assessment if it has been performed (see Section B: General Information). The total points for each section should be transcribed to the place provided and the percentage for each section calculated (points of section divided by total points expressed as a percentage). Once all the sections are completed, the sub-total can be calculated.

A separate section is provided for calculating the score for blood, urine & feces Culture. This will allow the assessor to calculate the scores for the individual sample types if the facility does not submit samples to the laboratory for all the sample types. To calculate the individual sample type scores see the figure below:

1. Total the points for one or more sample types and transcribe the scores to the place provided (see (1) below).
2. The percentage for the individual sample type scores is calculated by adding the AMR LCI Scorecard Sub-Total score (2) to the score of the individual sample type (1) and dividing by total (3). The result is expressed as a percentage.

For example:

If the AMR LCI score was 21 / 46 and the score for blood culture was 19 / 34 then:  

$$(21 + 19) / (80) = 50\%$$

Section	Total points possible	Current Audit		Previous audit	
		Date:		Date:	
		Current audit score		Previous audit score	
1. Clinical Facility Documents, Policies & Structures	21		%		%
2. Department Documents, Policies & Structures	8		%		%
3. Sample Requisition	5		%		%
4. Sample Collection & Transport GENERAL	4		%		%
5. Sample Laboratory Result Review & Patient Management	8		%		%
<b>Laboratory Clinical Interface Sub-Total</b>	<b>46</b>		%		%

Sample Collection & Transport:	Total points possible	Current audit score	Previous audit score
BLOOD CULTURE	34	(1) + (2) / 80 = %	(3) %
URINE CULTURE	12	(1) + (2) / 58 = %	(3) %
FAECES CULTURE	8	(1) + (2) / 54 = %	(3) %
<b>Laboratory Clinical Interface Total</b>		/ 100 = %	

If all sample types are included in the assessment an overall score for assessment can be calculated by adding all the individual sample type scores to the AMR LCI Scorecard Sub-Total score and dividing by 100.

## B. General Information

This section is compulsory for all assessments. The section is used to collect general information about the clinical facility and provides the assessor the context for performing the assessment. The "General Information" section is best completed in conjunction with the facility manager (or equivalent).

## C. Clinical Site Assessment

### Section 1: Clinical Facility Documents, Policies & Structures

The following section of the checklist is the same for all departments assessed. Complete this section only once if evaluating multiple departments during one assessment. The score for this section will apply to all departments being evaluated.

LC1.1 Assessors should note that various AMR oversight committees that have functions that fall within the scope of this scorecard may be established at different health facilities. Such committees include Antibiotic Stewardship Committee (ASC), Infection Control Committee (ICC), Drug and Therapeutics Committee (DTC) and Hospital Surveillance / Outbreak Team (HOT). The role of the AMR oversight committee(s) is to provide oversight and coordination for AMS activities at the clinical facility, including the activities of the Hospital's AMS team(s). AMR oversight committee(s) may either form a stand-alone committee or be incorporated into the agenda of either the hospital's IPC or another clinical committee. If AMS is positioned within an already existing committee, AMS activities must be included in the agenda of that committee as standing items. There must be clearly defined lines of communication and feedback provided between the AMR oversight committee(s) and other relevant hospital committees, heads of nursing, pharmacy, quality improvement and other relevant heads of departments. The assessors should use their discretion to determine whether the committee(s) at the clinical facility meet the following requirements:

- The committee(s) should be multi-disciplinary and comprise clinicians, nurses, public health specialists, pharmacists, infection control specialists, microbiologist/laboratorian and a statistician / data specialist and/or epidemiologist.
- The committee(s) should meet regularly and there should be meeting minutes from the committee(s) which can be used to communicate and document the extent of their activities.

- The duties of the committee(s) should include:
  - Education, sensitization and training of clinicians.
  - Guideline development. Assessors should note that guidelines for the surveillance and management of AMR & Hospital Acquired Infections (HAI) including treatment guidelines and the medicines formulary are often developed nationally. Assessors should determine whether the clinical facility contributes to development of these policies and / or revised the guidelines to fit the local conditions in particular, whether the revisions to treatment guidelines are based on local AST data provided by the laboratory.
  - Review cumulative AST rates provided by the laboratory (at least annually).
  - Review pharmacy antibiotic usage data by ward or department.
  - Investigate unexpected antibiotic usage by ward / department or prescriber.
  - Review the outcomes from antimicrobial stewardship (AMS) ward rounds.

Assessors should note that the relationship between the laboratory and AMR oversight committee(s) should be bi-directional (also see AMR Lab Scorecard (Section 2). In addition, assessors should note that wards or departments should liaise with the committee(s) regarding suggestive nosocomial outbreaks or HAI (see LC2.2).

LC1.2 The assessor should review the contents of the Laboratory Handbook to determine whether the requirements are met. This question corresponds to the AMR Lab Scorecard (Section 2) and LC3.1. Assessors should note that while the Laboratory Handbook may contain general information on the collection of blood, urine & feces, that specific requirements for culture and AST must be mentioned to fulfil the requirement.

LC1.3 - LC1.5 The assessor should review the facility treatment guidelines or prescriber guidelines to determine whether there are specific requirements for collection of samples for blood, urine & feces culture. The treatment or prescriber guidelines for common medical conditions should include recommendations on the choice of antibiotic, dose, treatment duration and on the escalation / substitution / addition / de-escalation / termination of antibiotics. Also see LC2.1.

LC1.6 Assessors should review the laboratory request form to determine whether the requirements are met. In addition to the specific requirements listed, assessors are referred to the general requirements listed in the SLIPTA checklist Q8.2. These include the use of a two-identifier system (e.g., both patient name and a numeric identifier must be present on the requisition and on the specimen). This question corresponds to the AMR Lab Scorecard (Section 8).

## **Section 2: Department Documents, Policies & Structures**

The following section of the checklist is to be completed in the department or ward to be assessed. Complete this section for every department if evaluating multiple departments during one assessment. This section is best completed in conjunction with the department or ward manager (or equivalent).

LC2.2 Assessors should determine whether the department or ward has an active relationship with the laboratory including regular meetings to troubleshoot gaps in specimen collection, referral, interpretation and reporting of results. This question corresponds to the AMR Lab Scorecard (Section 2 & 4).

An active relationship between the department or ward and AMR oversight committee(s) is also essential. Assessors should determine whether such a relationship exists by reviewing the minutes of the AMR oversight committee(s) meetings as well reviewing the composition or attendance of AMR oversight committee(s) meetings and by questioning clinicians if minutes do not exist (see LC 1.1).

### Section 3: Sample Requisition

The following section of the checklist is to be completed in the department or ward to be assessed. Complete this section for every department if evaluating multiple departments during one assessment. This section is best completed in conjunction with the department or ward manager (or equivalent).

LC3.1 At least one copy of the Laboratory Handbook should be available in all wards or departments. To fully meet the requirement, assessors should ask the clinicians in the department/ward as to whether they know where the Laboratory Handbook is kept, and what information it contains.

LC3.2 - LC3.3 Assessors should review 10- 20 patient folders to determine whether the requirements are met. Assessors should determine whether consent for sample collection is required at the clinical facility (or whether sample collection is considered non-invasive). If there is no requirement for consent, this question should be answered "NA"

### Section 4: Sample Collection & Transport

The following section of the checklist is to be completed in the department or ward to be assessed. Complete this section for every department if evaluating multiple departments during one assessment. This section is best completed in conjunction with the clinician responsible for sample collection and transport. Assessors should be aware that practices between individual health care workers and clinicians may vary greatly. If possible, the assessor should observe multiple health care workers or clinicians performing the procedures.

This section is divided into four components:

Sample Collection & Transport GENERAL-these questions pertain to blood, urine & feces sample collection for culture. The section should be completed once if the department or ward is being assessed for more than one of the individual sample types. Observation of sample collection & transport practices is required to complete this and the subsequent sub-sections of Section 4.

Sample Collection & Transport - BLOOD, URINE & FECES

The requirements for sample collection & transport practices of blood, urine & feces should be assessed as per the Scorecard. Additional information on sample collection & transport practices can be found in these resources:

- [WHO Blood Collection Guidelines](#)
- [Specimen collection and transport for microbiological investigation](#)

### Section 5: Laboratory Result Review & Patient Management

The following section of the checklist is to be completed in the department or ward to be assessed. Complete this section for every department if evaluating multiple departments during one assessment. This section is best completed in conjunction with the department or ward manager (or equivalent).

LC5.1 Assessors should review a selection of patient folders to determine whether the requirements are met. Assessors may experience difficulties finding evidence that critical call outs regarding patient test results are promptly communicated if these are done orally or by phone. Assessors should review test results in the patient records carefully to determine whether test results for blood, urine and feces culture are promptly received, filed & reported. To determine whether results are being placed in patient folders, assessors should work in conjunction with the laboratory to determine what results were sent, and then locate these in the patient folder.

LC5.2 1 Assessors should review between 10 and 20 patient folders to determine whether the requirements are met. Assessors should note that it is recommended that clinical facilities perform a comprehensive and regular review of patient folders as part of their AMS practices. This assessment should support such reviews, but not replace them.

The assessor should use the facilities treatment or prescriber guidelines for common medical conditions to determine whether the recommendations on the choice of antibiotic, dose, treatment duration and on the escalation / substitution / addition / de-escalation / termination of antibiotics are being followed. Also see LC1.3-LC1.5. Whether appropriate tests are being requested may be more difficult to assess. It is recommended that the assessor review the patient folder against the guidelines, and if it is assessed that guidelines were not followed, perform root cause analysis to determine the reason.

## 5. Reporting the assessment

At the end of the assessment, the assessor must:

1. Score the AMR LCI Scorecard.
2. Identify gaps in the current practices and make recommendations for improvement (questions with "No" and "Partial" answers), and report these to the department or ward and the clinical facility management. Where possible, the assessor should support their findings with tools which could help the clinical facility address the areas for improvement.
3. Meet with the clinical facility management and communicate the findings of the assessment.

Within two weeks of the assessment, the assessor must submit a final report to the clinical facility management. The report should include a copy of the completed AMR LCI Scorecard as well as the observed commendations, observed challenges and recommendations.


## References

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+251 11 551 7700

 [africacdc@africa-union.org](mailto:africacdc@africa-union.org)

 [www.africacdc.org](http://www.africacdc.org)

 [africacdc](https://twitter.com/africacdc)

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Africa Centres for Disease Control and Prevention (Africa CDC),  
African Union Commission  
Roosevelt Street W21 K19, Addis Ababa, Ethiopia