

# 2. Purpose of the LIMS

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The primary purpose of the Malawi LIMS is to **digitize, standardize, and improve laboratory operations while ensuring that reliable laboratory information is available to support patient management and public health decision-making.**

The system is designed to manage the laboratory testing lifecycle from patient registration through sample collection, testing, result validation, reporting, and synchronization with national health information systems.

The LIMS serves several important purposes.

### 2.1 Digitization of Laboratory Processes

The LIMS replaces or reduces manual laboratory processes by providing electronic workflows for activities such as:

- Patient registration
- Laboratory test ordering
- Sample collection
- Barcode generation
- Sample reception
- Sample tracking
- Result entry
- Result verification
- Result authorization
- Result printing
- Reporting
- Data synchronization

Digitization helps laboratories manage information more efficiently and provides greater visibility of laboratory activities.

### 2.2 Improved Turnaround Time

The LIMS is intended to reduce the time between sample collection, testing, result authorization and availability of results to clinicians and patients.

The existing implementation has demonstrated significant improvement in Viral Load turnaround time, with documented reduction from approximately **70 days to 13 days** through workflow automation and interoperability.

## **2.3 Reduction of Manual and Transcription Errors**

Integration between LIMS and laboratory analyzers reduces the need for manual transcription of laboratory results.

More than 80% of supported laboratory analyzers have been interfaced, helping reduce manual data entry and associated transcription errors.

## **2.4 Improved Laboratory Quality**

The LIMS provides functionality for quality control, result verification, authorization, and reporting.

It supports:

- Internal quality control
- External quality control
- QC reporting
- QC result printing
- Result verification
- Result authorization
- Audit trails

## **2.5 Interoperability**

The LIMS provides an electronic information exchange mechanism between laboratory systems and other health information systems.

Integration with ART/EMR enables electronic laboratory ordering and electronic delivery of laboratory results.

The system also supports API-based interoperability and integration with national systems such as EID/VL LIMS and external partners.

## **2.6 National Laboratory Analytics**

The national LIMS environment provides aggregated information for monitoring laboratory performance.

National dashboards can provide information relating to:

- Facility
- District
- Region
- Synchronization status
- Laboratory workload
- Turnaround time
- Facility performance
- Machine utilization

- Sample rejection
  - Reporting completeness
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