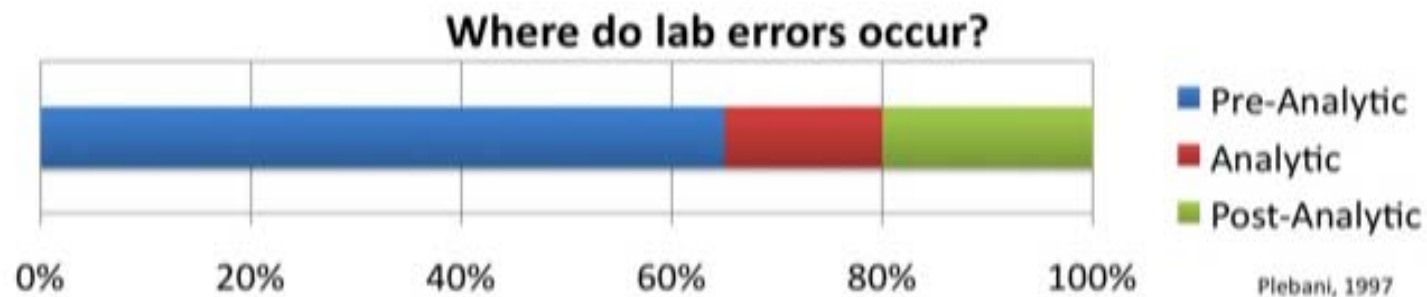
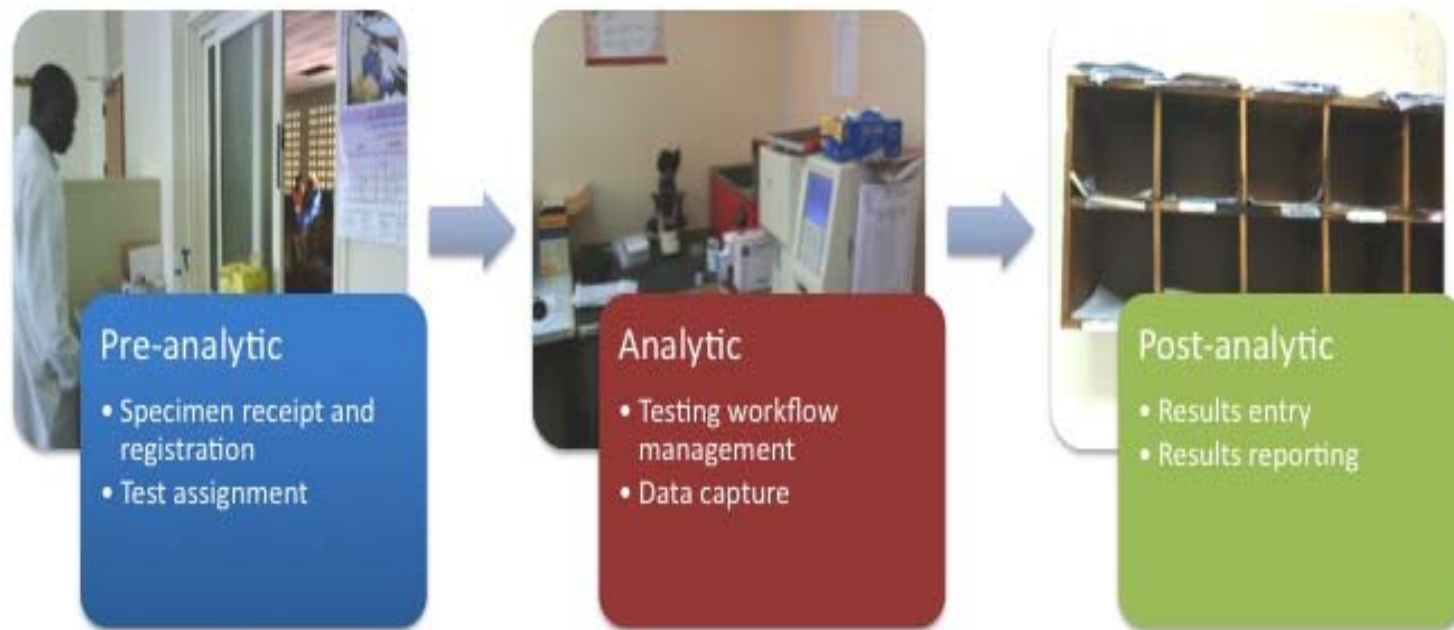


Basic Laboratory Information System (BLIS)

Background

- To address the need for accurate and reliable laboratory data, the Centers for Disease Control and Prevention (CDC) and the Computing 4 Good @ Georgia Institute of Technology group (C4G) initiated a collaboration in 2009 to develop a robust Basic Laboratory Information System (BLIS) designed specifically for the needs of service-delivery level laboratories in resource-limited settings, which represent the majority of the nearly 2,000 laboratories that are supported by PEPFAR.
- BLIS has been developed with ongoing input from CDC field staff, implementing partners, and laboratorians in Botswana, Cameroon, Ghana, Kenya, Nigeria, Tanzania, Uganda, and Zambia.
- The system aims to address the specific needs of laboratory data collection and management from specimen receipt to results reporting.

Laboratory specimen flow



Laboratory data challenges

- Accurate and reliable clinical laboratory test results are a critical component of a public health approach to disease management in resource-limited settings. Laboratory data are essential for clinicians to accurately assess the status of patients' health, make accurate diagnoses, formulate treatment plans, and subsequently monitor the effects of treatment. However, in the majority of PEPFAR-supported laboratories, clinical laboratory data is generally not stored in a manner in which it can be easily accessed, summarized, or analyzed. Moreover, these data are generally recorded in multiple, non-standardized, and often somewhat illegible log books, which presents a significant challenge to any efforts to conduct analyses or reporting.

Laboratory data challenges



Figure 1. Specimen labeling and workflow

Laboratory data challenges

The figure displays several examples of non-standardized laboratory data registers. These registers are handwritten and show a variety of data entry formats, including inconsistent column headers, missing data, and varying levels of detail. The registers are arranged in a collage, illustrating the challenges of data collection and management in a laboratory setting.

Figure 2. Non-standardized laboratory data registers

Laboratory data challenges



Figure 3. Data storage, retrieval, and analysis

BLIS

- BLIS is designed to be highly-customizable by a laboratory manager and extremely user-friendly for all laboratorians.
- It is built with a MySQL back-end with a PHP front-end, which enables it to be run from a standard internet browser.
- The system can be run locally on a single machine or on a local area network. It can also be run in a hosted or wide area network configuration.

BLIS

Basic Laboratory Information System

Logged in as: testadmin | [Edit Profile](#) | [Logout](#) | [Comments?](#)

HomeLab ConfigurationsTest CatalogReports

New Lab Configuration | [Cancel](#)

Facility Name *

Location *

Lab Admin *

RHINO

Guanajuato, Mexico

testadmin

[Specimen Types »](#)

[Test Types](#)

[Technicians](#)

[Custom Fields](#)

Specimen Types [View All](#)

Enter here

Serum x

Whole Blood EDTA x

Plasma EDTA x

Urine x

Stool x

Sputum x

Submit

[Cancel](#)

Tips

Please select specimen types, test types and technician accounts that are handled at the lab facility.

BLIS

Basic Laboratory Information System

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[Home](#) | [Lab Configurations](#) | [Test Catalog](#) | [Reports](#)

Lab Configuration updated | [« Back to Configurations](#)

Facility Name	RHINO
Location	Guanajuato, Mexico
Lab Admin	testadmin
Specimen Types	Serum Whole Blood EDTA Plasma EDTA Urine Stool Sputum
Test Types	Amylase Cholesterol Platelet Count Sodium Total Albumin Uric Acid White Blood Cell Count
Technician Accounts	rhino_tech [RHINO Technician] Read-Write

BLIS

Basic Laboratory Information System

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[Home](#) | [Lab Configurations](#) | [Test Catalog](#) | [Reports](#)

Target TAT Values | Site: RHINO - Guanajuato, Mexico | [Cancel](#)

Test	Goal TAT
Amylase	<input type="text" value="6"/> Hours
Cholesterol	<input type="text" value="6"/> Hours
Platelet Count	<input type="text" value="6"/> Hours
Sodium	<input type="text" value="6"/> Hours
Total Albumin	<input type="text"/> Hours Days
Uric Acid	<input type="text"/> Hours
White Blood Cell Count	<input type="text"/> Hours

[Cancel](#)

C4G BLIS - A joint initiative of C4G @ Georgia Tech, the CDC and participating countries

Figure 4. Configuration of new laboratory in BLIS

BLIS

Basic Laboratory Information System

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[Home](#) | [Register Patient/Specimen](#) | [Results](#) | [Search](#) | [Reports](#)

Specimen Registration | Session No. 20100222-1 | [Cancel](#)

* required field

Specimen Type *

Whole Blood EDTA

Tests *

☒ Platelet Count

☐ Uric Acid

☒ White Blood Cell Count

Specimen ID *

23456

Additional ID

Lab Receipt Date *

2010

02

18

Collection Date *

2010

02

17

Collection Time *

06

:

11

hrs

Comments

Report To

Doctor/Hospital

Doctor/Hospital Name

Dr. Hernandez

Patient ID

123456

Addl ID

-

Name

RHINO Tester

Gender

M

Age

40 years

Date of Birth

1970 (partial)

[Add another specimen »](#)

Submit

Cancel

Figure 5. Patient and specimen registration in BLIS

12

BLIS

- BLIS generates a wide variety of standard and customizable reports for use in the laboratory, for reporting to patients or clinicians, and for aggregate indicator-level reporting.

BLIS

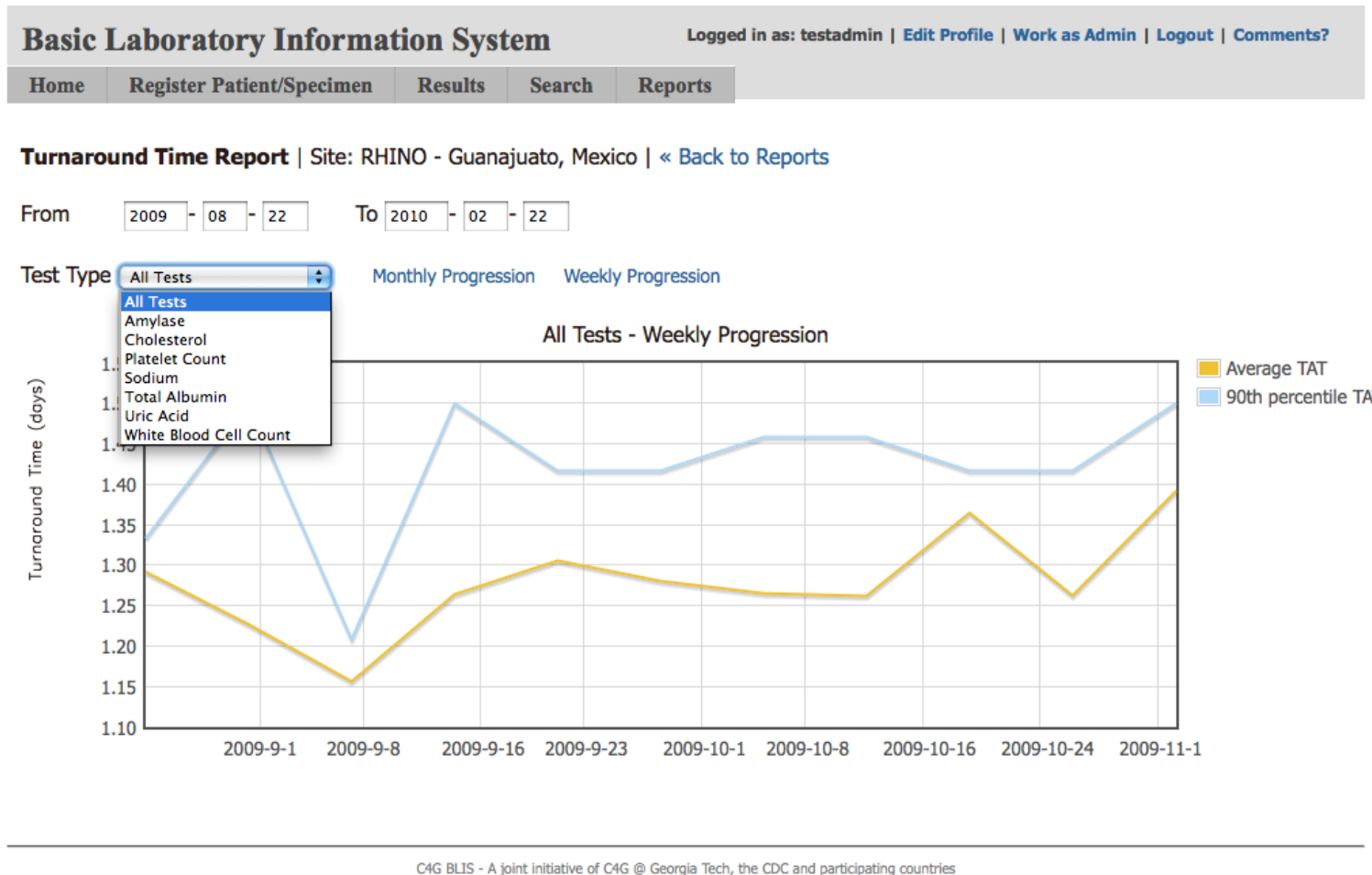


Figure 5. Example turn around time report

BLIS

Basic Laboratory Information System

Logged in as: testadmin | [Edit Profile](#) | [Work as Admin](#) | [Logout](#) | [Comments?](#)

[Home](#) | [Register Patient/Specimen](#) | [Results](#) | [Search](#) | [Reports](#)

Home

Welcome, testadmin.

The Basic Laboratory Information System (BLIS) tracks patient specimens and laboratory results.

RHINO - Guanajuato, Mexico

Total Pending Tests	41
Amylase	8
Cholesterol	6
Platelet Count	10
Sodium	7
Total Albumin	0
Uric Acid	6
White Blood Cell Count	4

Tips

You can update your profile and password by clicking on **Edit Profile**.

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Figure 6. Example login screen for laboratory technician. BLIS aims to empower lab technicians and laboratory managers to improve the quality of results generated in the laboratory even as the quantity of testing increases.

Next steps

- Pilot implementations of BLIS are currently being planned in Uganda, Tanzania, Cameroon, and Ghana through the guidance of the respective Ministries of Health in each country, CDC headquarters and CDC in-country staff, and with implementing partners.
- The African Field Epidemiology Network (AFENET) will lead implementations in Uganda and Tanzania
- Global Health Systems Strengthening (GHSS) will lead implementations in Cameroon and Ghana.
- We aim to have a reliable, robust and free system ready for ongoing development ready to share within one year.

For further information

We welcome your feedback.

Please feel free to contact Mark DeZalia at mdezalia@cdc.gov with questions, suggestions or comments.

We also welcome you to try BLIS!

The online version can be accessed at: lis.cc.gatech.edu

Generic administrator login User: testadmin / Password: admin123

Generic technician login User: testlab1_tech1 / Password: tech123

If you would like a custom account, please contact Mark DeZalia.