BLIS - Kenya

User Guide

BLIS-Kenya v2.5 - A joint initiative of C4G @ Georgia Tech, the CDC,

@iLabAfrica - Strathmore University , Association of Public Health Laboratories (APHL) and participating countries

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What is BLIS?

The Basic Laboratory Information System, BLIS, is a freeware Web-based system that can be installed in a local, district, or national laboratory. It is a tool that can help to standardize data, which improves the ability to run useful reports and can both give a realistic picture of laboratory services and assist with staff and budget planning. With enough data, BLIS can be used to track disease prevalence over time

Features of BLIS include:

- One-time entry of each unique patient
- Standardization of data collected (allowable entries for specimen type, test type, patient data, reagents are set at MOH level and then entered consistently throughout a country)
- Customization to a country's needs
- Ability to track lab supplies such as test kits, reagents
- Ability to run reports as specified by a country
- Automatic alerting of data values that may be out of range(reference ranges and panic values are set at the regional or national level)
- Daily logs to be reviewed for data verification
- Simple data backup

As with any properly implemented electronic record system, BLIS may be found over time to improve data accuracy and reduce costs in laboratories. Benefits already seen in labs using BLIS:

- Reduced burden for technicians, as results are available soon after testing
- Improved consistency of data entry
- Ability to view patient history and track samples
- Ability to aggregate data and analyze data patterns and trends at a regional or national level
- Printed patient records in place of handwritten records
- Printed daily logs that make the reports look like the paper forms used in the laboratory

BLIS Installation

Installing BLIS-Kenya on XAMPP for Windows

1. Install XAMPP
2. Start the XAMPP Control Panel, Start the Apache and MySQL components.

   You can also start the other components, if you plan to use them.

   Verify the Apache install, by clicking on the Apache administrative link in the Control Panel.

   Verify the MySQL installation, by clicking on the MySQL administrative link in the XAMPP Control Panel. If the verification steps are successful, XAMPP should be successfully installed on your PC.

   Open a browser and enter "localhost" on your address bar. You will be redirected to a page telling you that you've successfully installed xampp on your system
3. Put the BLIS-Kenya [https://github.com/ilabafrica/BLIS-Kenya/tree/BLIS-KDH] folder in a subdirectory of your installation named htdocs.

   ```
   C:\xampp\htdocs\
   ```
4. Create databases

   ```
   blis_301
   ```

   and

   ```
   blis_revamp_prod
   ```

   Import tables and basic operations information from SQL [https://github.com/ilabafrica/BLIS-Docs/blob/BLIS-Docs/BLIS-Kenya_Documentation/DB_tables.zip] files of the same names
5. Set up a static IP address for other computers on your network to view the server you have created
6. Login with the username: **superadmin** and password: **admin123,** be sure to change this password after logging in

Installing LAMP on Linux

Install Apache

To start off install Apache

1. Open up the Terminal (Applications > Accessories > Terminal).
2. Copy/Paste or type the following line of code into Terminal and then press enter:

   ```
   sudo apt-get install apache2
   ```

3. The Terminal will then ask you for your password, type it and then press enter.

Testing Apache

Test Apache to ensure it is working properly.

1. Open up any web browser and then enter the following into the web address:

   ```
   http://localhost/
   ```

2. You should see a folder entitled apache2-default/. Open it and you will see a message saying "It works!”

Install PHP

1. Open up the Terminal (Applications > Accessories > Terminal).
2. Copy/Paste or type the following line into Terminal and press enter:

   ```
   sudo apt-get install php5 libapache2-mod-php5
   ```

3. In order for PHP to work and be compatible with Apache, restart Apache. Type the following code in Terminal to restart:

   ```
   sudo /etc/init.d/apache2 restart
   ```

Test PHP

To ensure there are no issues with PHP, give it a test run.

1. In the terminal copy/paste or type the following line:

   ```
   sudo gedit /var/www/testphp.php
   ```

   This will open up a file called testphp.php.

2. Copy/Paste this line into the phptest file:

   <?php phpinfo(); ?>

3. Save and close the file.
4. Open the web browser and type the following into the web address:

   ```
   http://localhost/testphp.php
   ```

   It will show you the page that has all information about your php.

   Apache and PHP are now installed

Install MySQL

1. Open up the Terminal and copy/paste or type this line:

   ```
   sudo apt-get install mysql-server
   ```

2. (optional). In order for other computers on your network to view the server you have created, you must first edit the "Bind Address". Begin by opening up Terminal to edit the my.cnf file.

   ```
   gksudo gedit /etc/mysql/my.cnf
   ```

   Change the line

   ```
   bind-address = 127.0.0.1
   ```

   bind-address = 127.0.0.1 And change the 127.0.0.1 to your IP address.

   The, terminal itself may ask to the set password, But if it doesn't follow the step 3.

3. Type the following into the Terminal:

   ```
   mysql -u root
   ```

   Copy/paste or type this line:

   ```
   mysql> SET PASSWORD FOR 'root'@'localhost' = PASSWORD('yourpassword');
   ```

   (Make sure to change yourpassword to a password of your choice.)

4. Install phpMyAdmin. Copy/paste or type the following line into Terminal:

   ```
   sudo apt-get install libapache2-mod-auth-mysql php5-mysql phpmyadmin
   ```

   To get PHP to work with MySQL, open php.ini. Type the following:

   ```
   gksudo gedit /etc/php5/apache2/php.ini
   ```

   Uncomment the following line by taking out the semicolon (;). Change this line:

   ```
   ;extension=mysql.so
   ```

   To look like this:

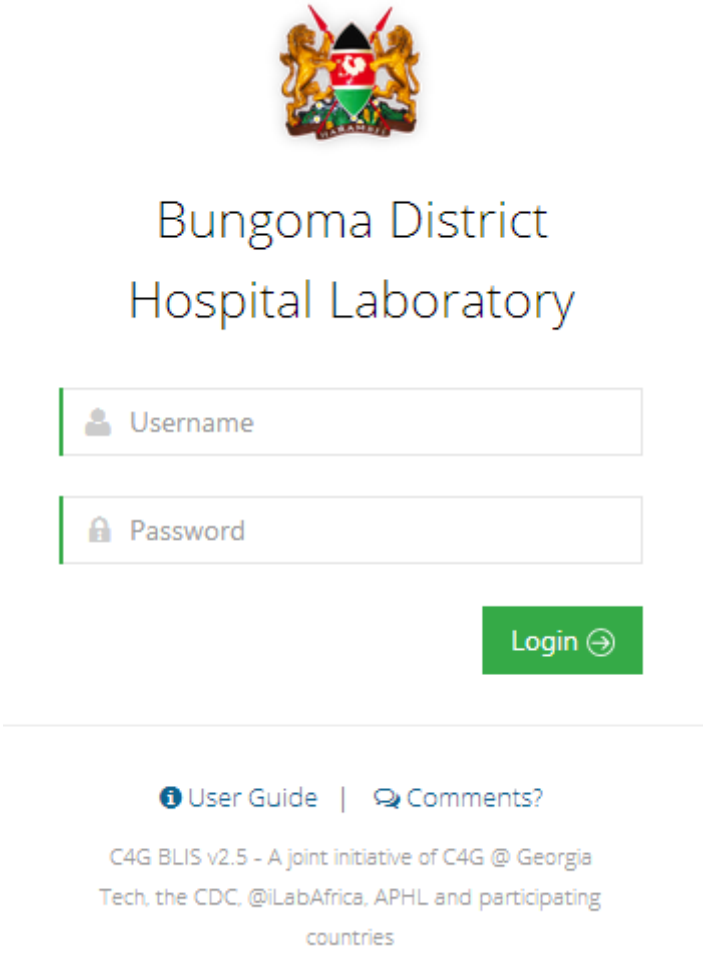
   ```
   extension=mysql.so
   ```

   Restart Apache and you are all set!

   ```
   sudo /etc/init.d/apache2 restart
   ```

Starting BLIS

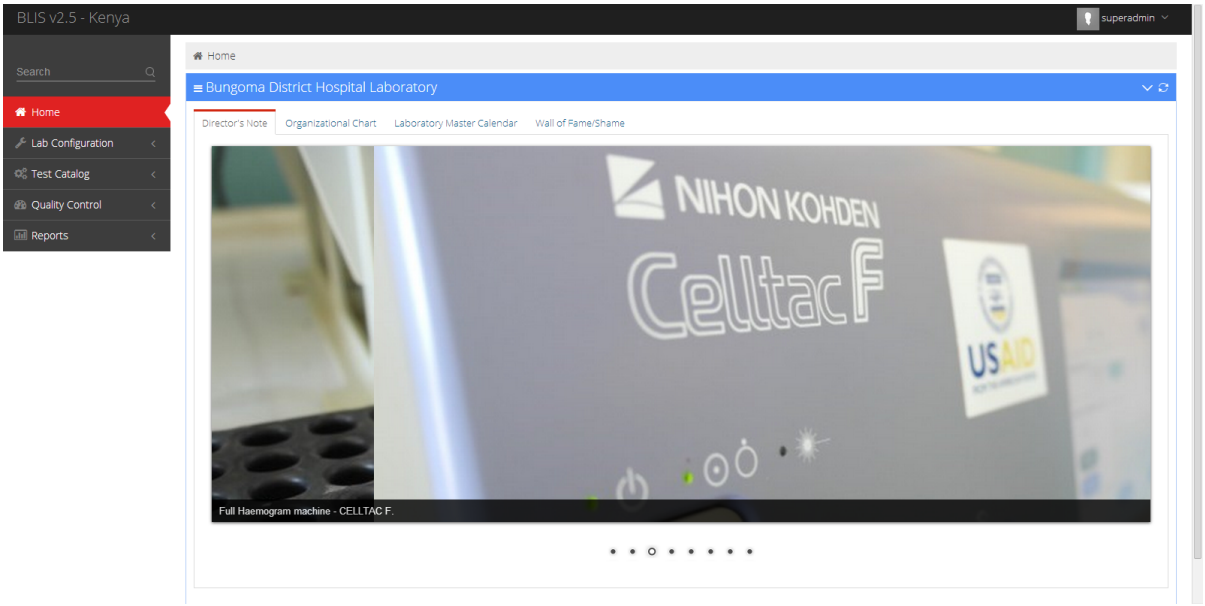
To start the Basic Laboratory Information System, you must click on the bookmark saved on the web browser e.g. Google Chrome or Mozilla Firefox. You will then see a page requesting login information. You must then enter your credentials to proceed.



If you have forgotten your password, kindly contact the lab-in-charge for help

Manager (Admin) Overview

The manager interface gives you the ability to add, edit, and delete users as well as change laboratory configuration settings. As a manager, you can also generate and print reports. When you log in as an administrator, you see the Manager home page.



To switch to technician view, click the **Work as Technician** link at the top right of the page. To go back to the manager view, click the **Work as Manager** link that will be in the same place on the screen.

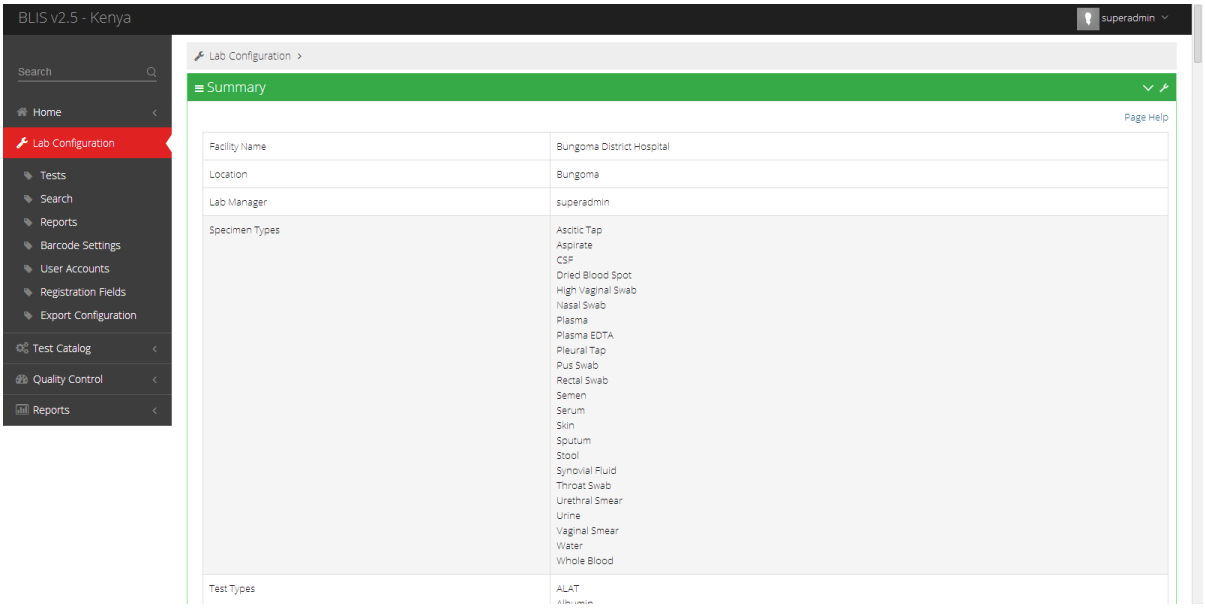
Lab Configuration

To switch to technician view, click the Work as Technician link at the top right of the page. To go back to the manager view, click the Work as Manager link that will be in the same place on the screen.

The various pages of this section are explained in the following pages:

Summary

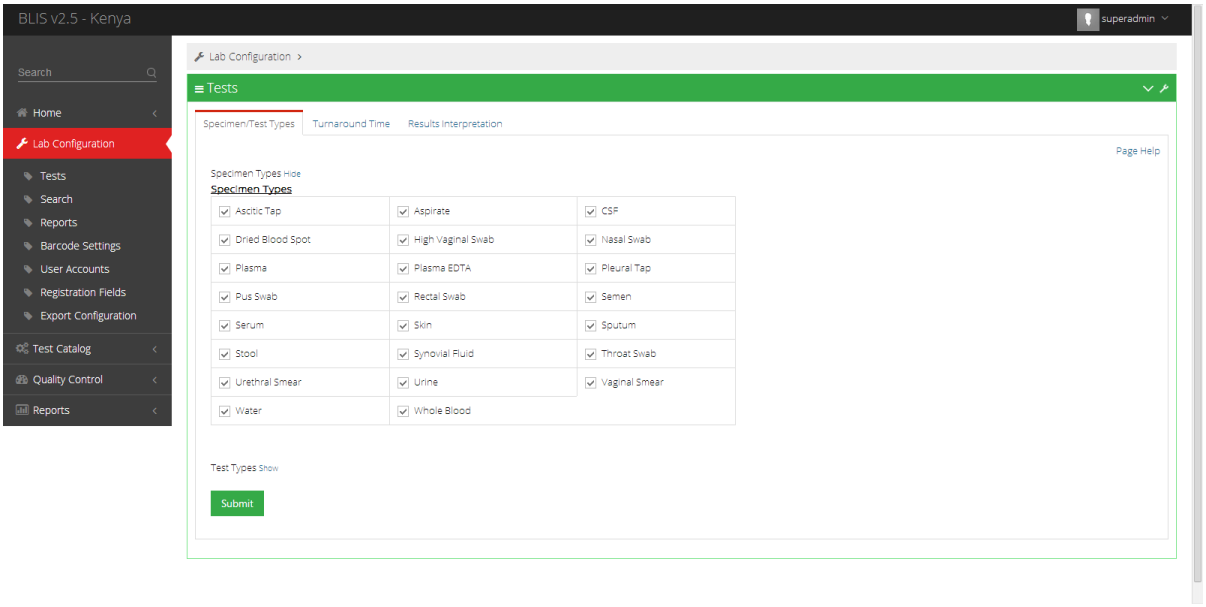
This page displays information about lab, specimen types, and test types. It also lists technicians' logins and privileges.



Tests

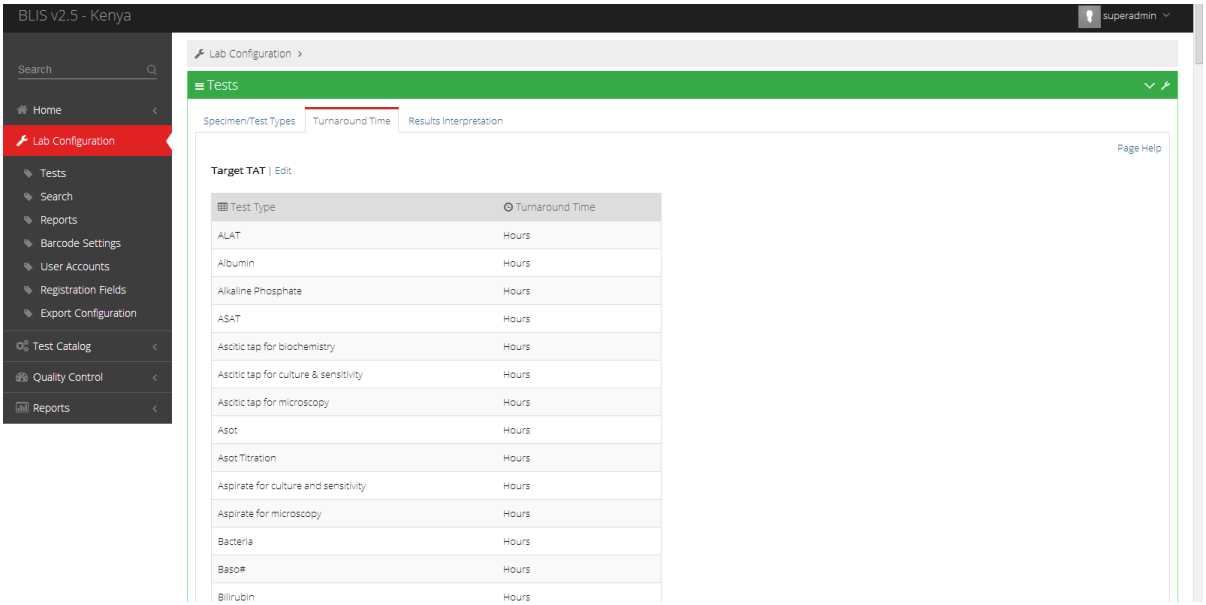
Specimen/TestTypes

Allows you to set the specimen and test types as appropriate for your country. Click **Show** to reveal and **Hide** to close the list. Check the box for each specimen type collected or test done at this facility, and click **Submit** to save.



Target TAT

Displays turnaround times for tests. To enter or change turnaround time, click **Edit**. The number and unit (such as “24 hours”) change to a text field and a drop-down list. Enter the desired number and choose **Hours** or **Days**. When finished, click the **Submit** button to save changes, or **Cancel** to discard changes. These options are below the list.



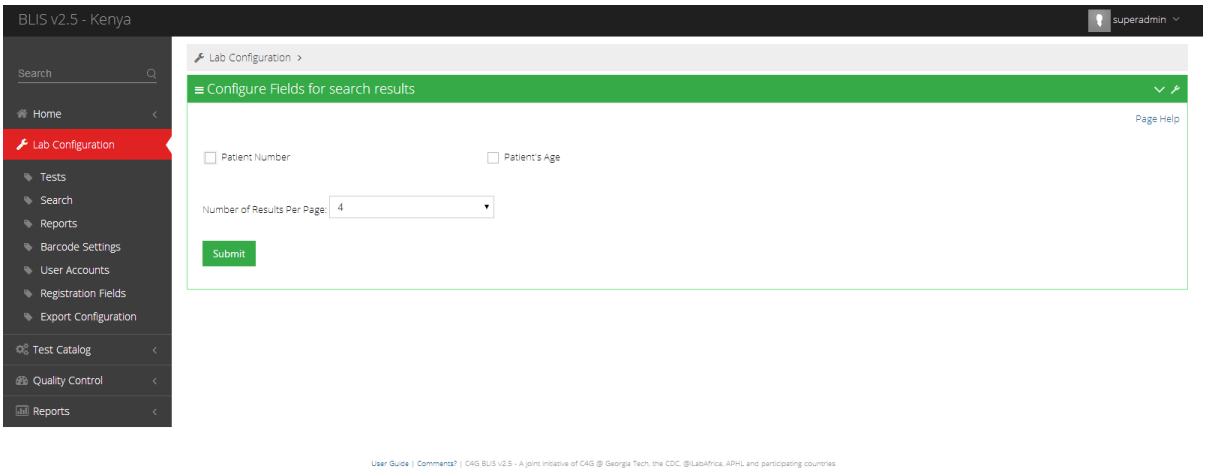
Results Interpretation

Allows you to specify the interpretation for multiple ranges of values for each test type. To view or edit an existing test's result, choose the test type from the drop-down list and click the **Search** button. The current interpretation appears. Edit using the text boxes.

Click the **Submit** button to save changes, **Cancel** to discard them.

Search

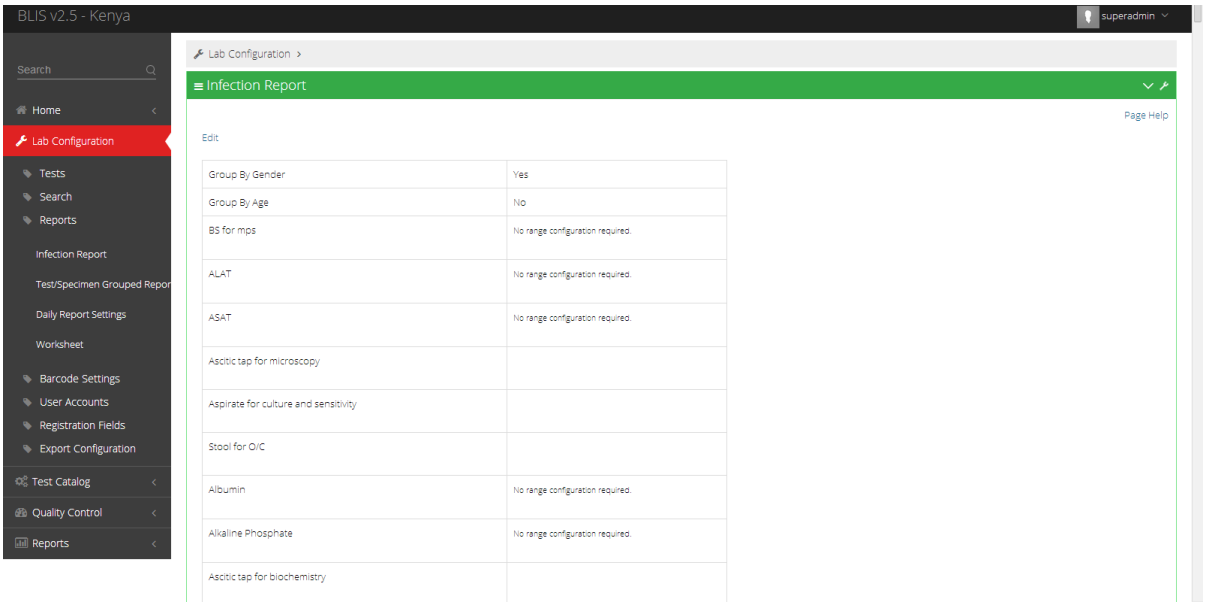
This section allows you to configure what results are displayed for each patient when a search is executed. It also allows you to change how many results are displayed on each page.



Reports

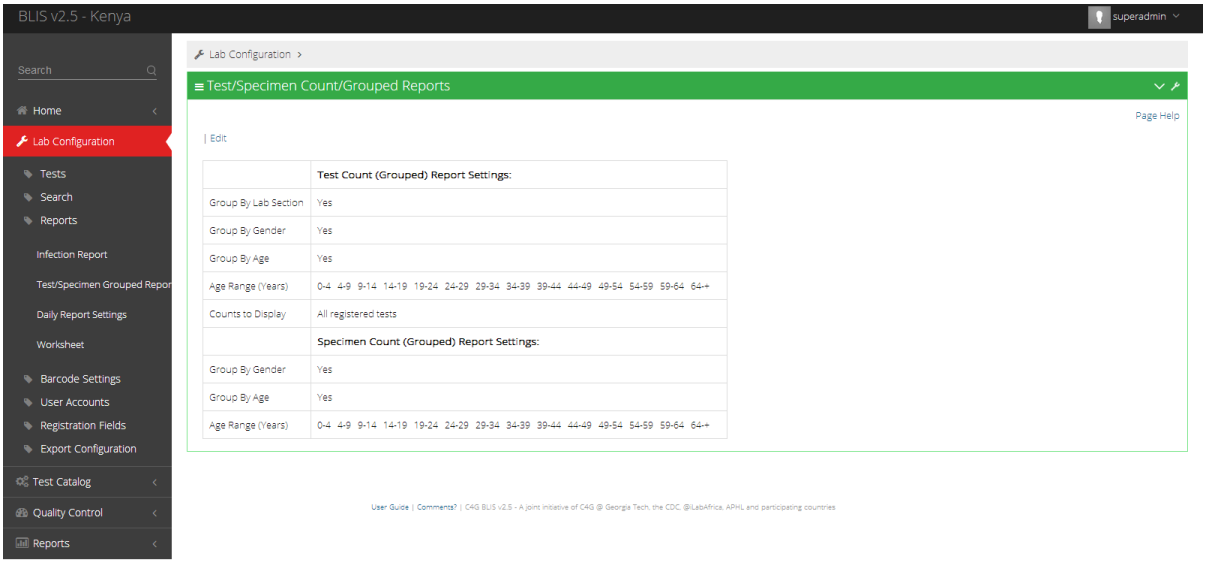
Infection Report

Generates an aggregate report of laboratory test results for a particular period for one or all lab sections. The tests listed in the report are the ones checked to include on the Specimen/Test Types page. Click **Edit** to make changes to the details reported. When finished, click **Submit** button to save changes, **Preview** to view the report, **Cancel** to discard changes.



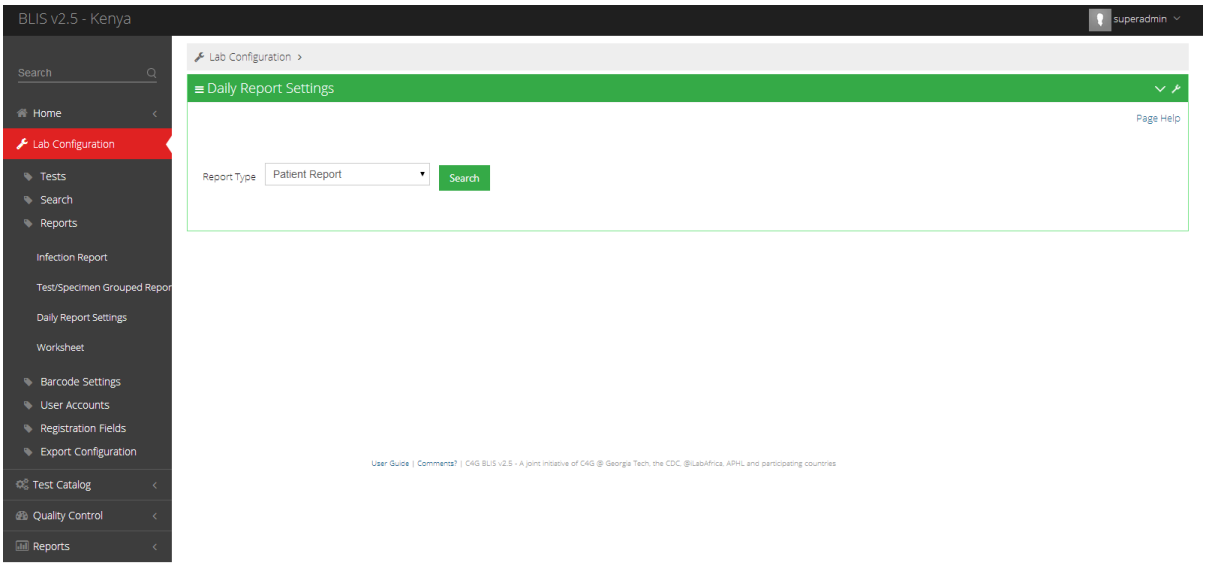
Test/Specimen Count Reports

Allows you to set the test and specimen count report content and layout. click **Edit** to make changes. When finished, click the **Submit** button to save changes, or **Cancel** to discard changes.



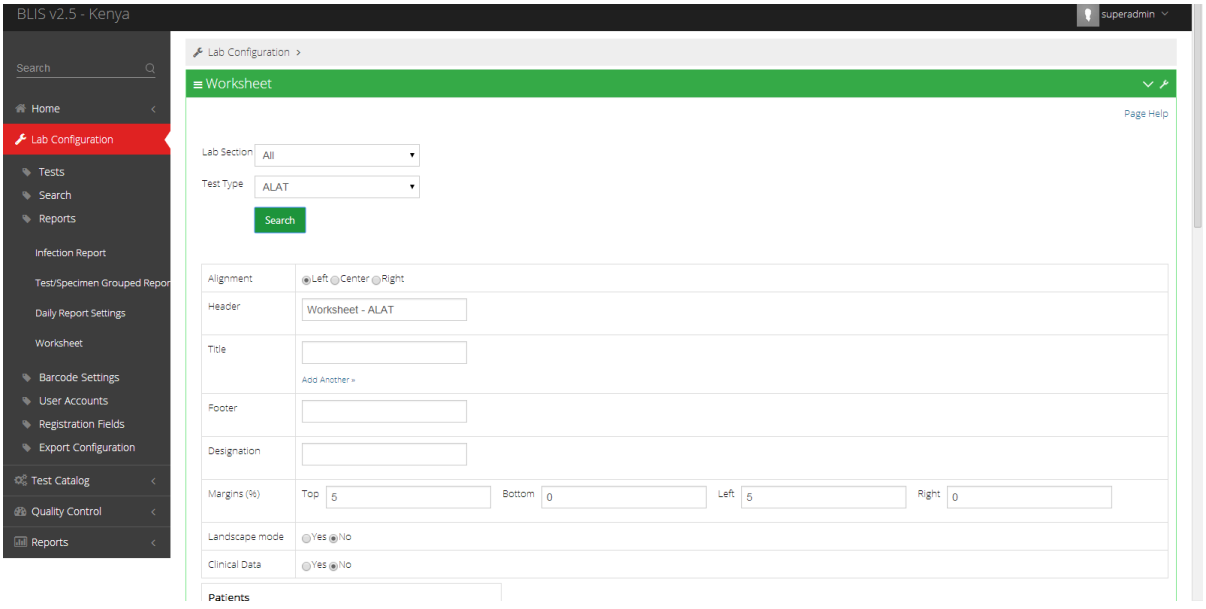
Daily Report Settings

Allows you to set the layout of the Patient Report, Daily Log of Specimens, and Daily Log of Patients. Use the drop-down to select the report type, and click **Search**. Edit report settings, and add or change a logo to appear on the report. Check or un-check boxes to show or hide patient, specimen, and test information. When finished, click the **Submit** button to save changes, or **Cancel** to discard changes. These options are below the list.



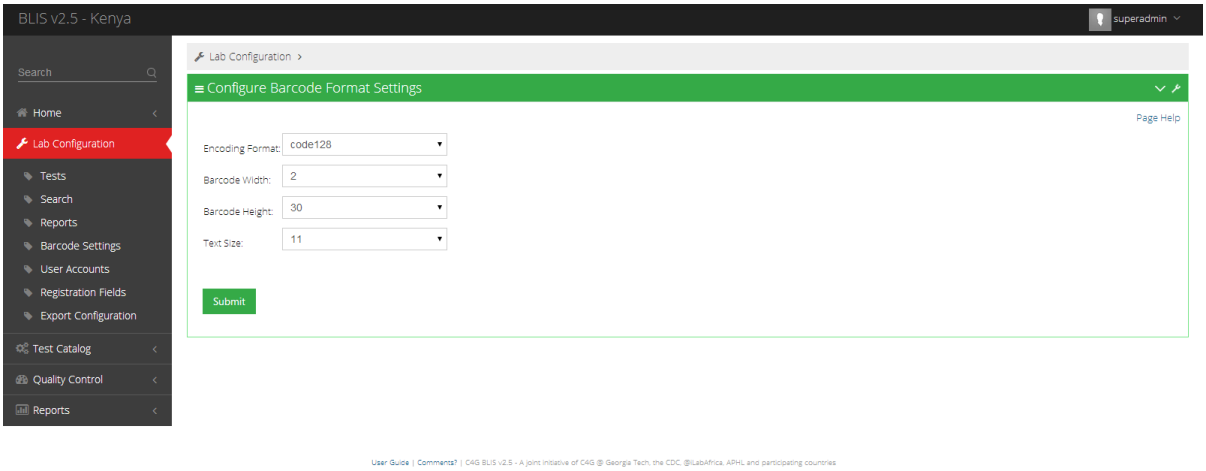
Worksheet

Allows you to create templates to gather patient data in the lab. In lab settings where data are not entered at the point of service, the data entry staff enter patient information and the tests ordered, then print the worksheet so that lab technicians can write test results and other data to be entered into BLIS. Select the **Lab Section** and **Test Type** and click **Search** to edit the report format. To edit a custom report, click **Edit** to the right of the report. To create a new custom worksheet, click the **Add Custom Worksheet** link at the bottom of the list.



Barcode Settings

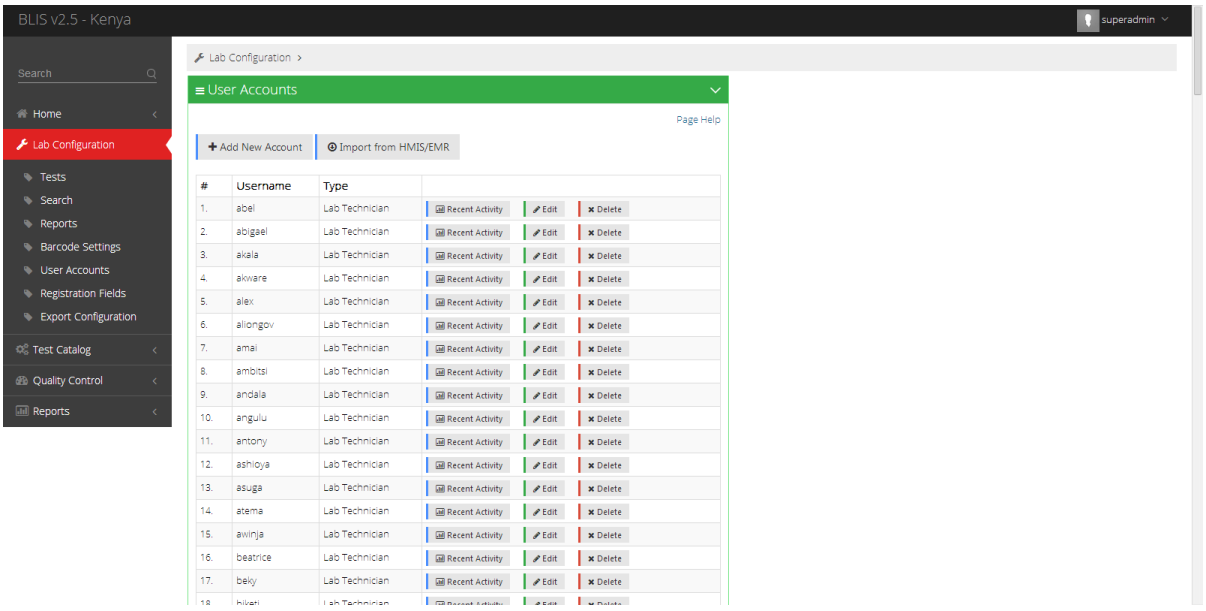
To alter the encoding format, barcode width, barcode height and text size. Click **Barcode Settings** on the left menu to make changes and **Submit** to save

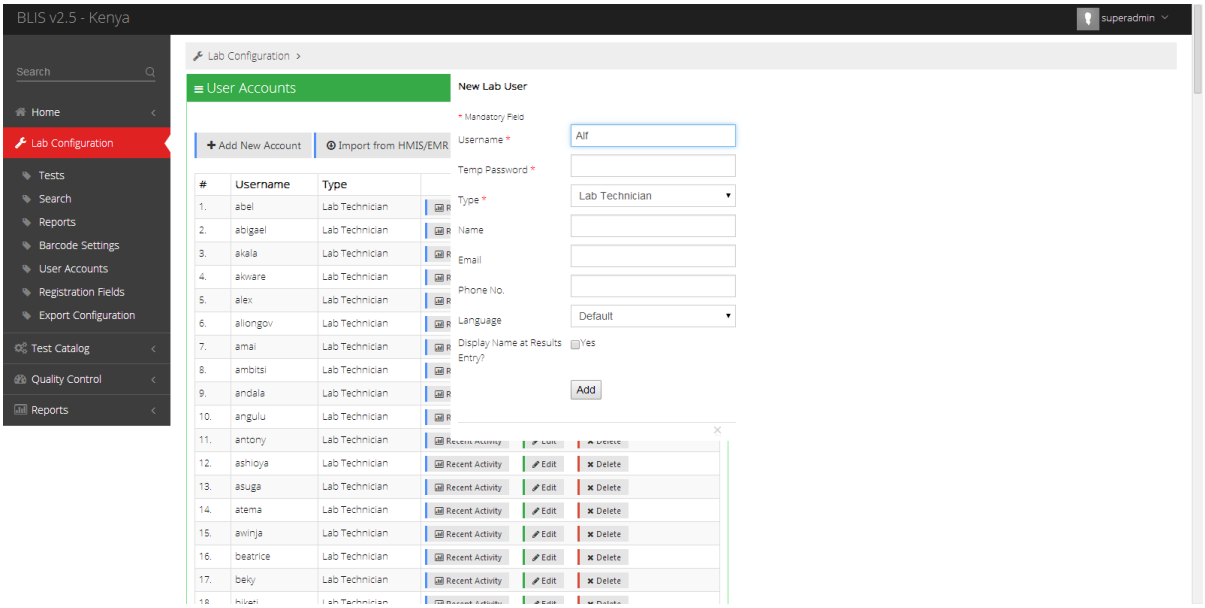


User Accounts

This page shows all the users with access to the system. It allows you to create new user accounts, edit account settings, delete accounts, and monitor account activity.

Click **Add New Account** to enter a new user.





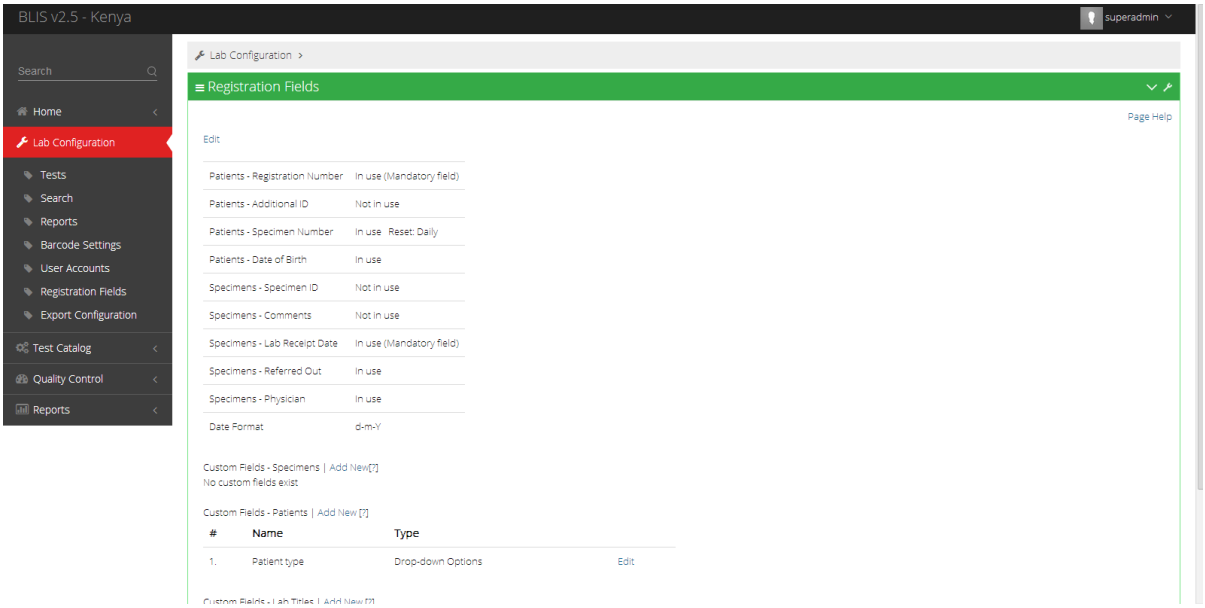
Recent Activity opens a new browser page to show the user's activity by location, specimen entry, and results. To view activity by date, enter or edit the start and end dates of the range you wish to see and click **View**. When you are finished, click **Print** or **Close This Page**.

Click **Edit** for a user to edit user account details or to reset password. **User Type** dictates the access the user has in the system. **Reset Password** allows you as administrator to enter a new password for this user. Click **Submit** button to save changes, **Cancel** to discard.

To remove a user account, click the **Delete** link for that user. A confirmation box appears. Click **OK** to complete the deletion, **Cancel** to keep that user's information.

Registration Fields

This page shows the configuration of the patient registration page. It allows you to create mandatory fields and hide the fields that are not used, per your country's protocols. It also allows for creation of certain custom fields for Patient registration and new Specimen addition which may be needed by certain labs only. To customize fields, click **Edit** to make changes: check the box to display a field, uncheck to hide. Set fields as required. After editing, click **Update** button below the fields to save changes, **Cancel** to discard. To create new fields, choose the **Add New** link for which to add, and enter field name and type. Click **Submit** button to save changes, **Cancel** to discard.



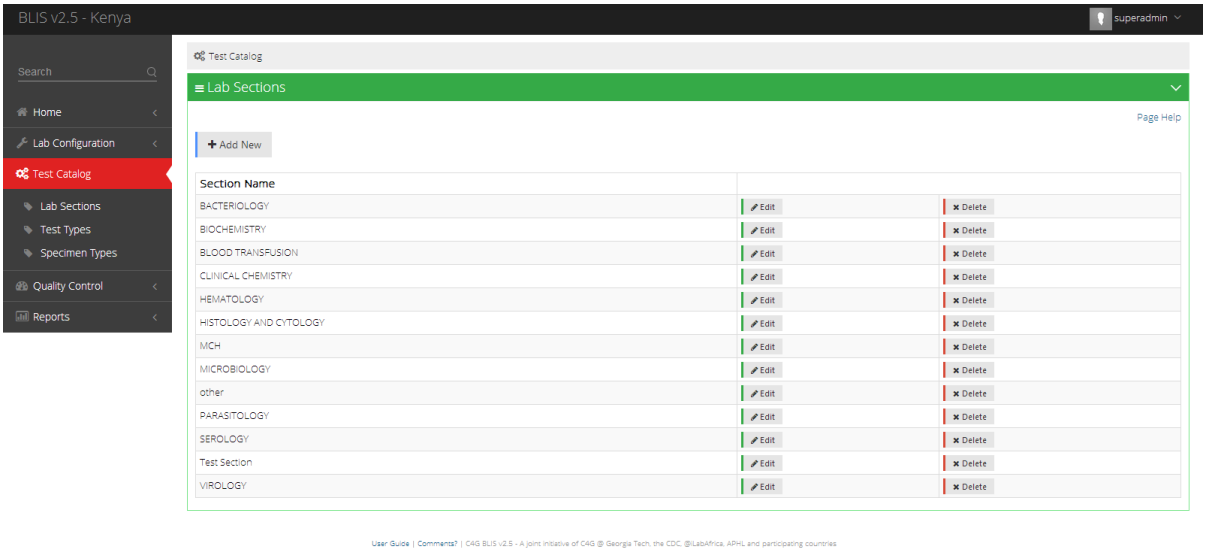
Export Configuration

Use this feature to export all configuration settings to Microsoft Word. Clicking this link opens a new browser tab with a preview showing all preset and custom fields as well as report settings. The preview has three buttons at the top: Print, Export as Word document, and Close. Click the **Print** button to open the print dialog box; Export as Word document to create a file named **blisreport_[date of report].doc**, which you may open or save, or **Close** to close this browser tab.

Test Catalog

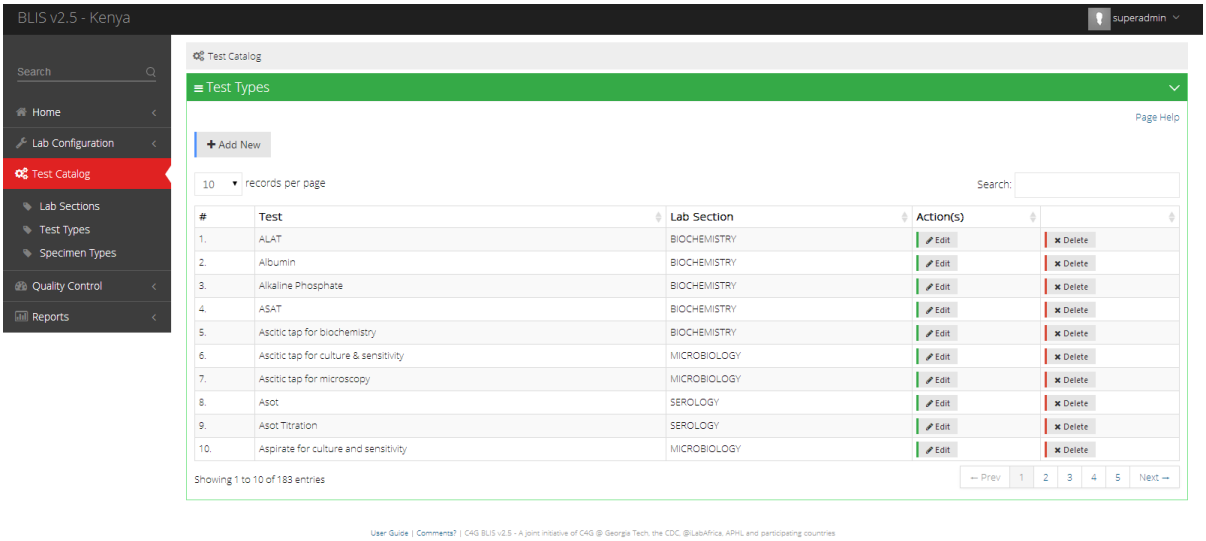
Lab Sections

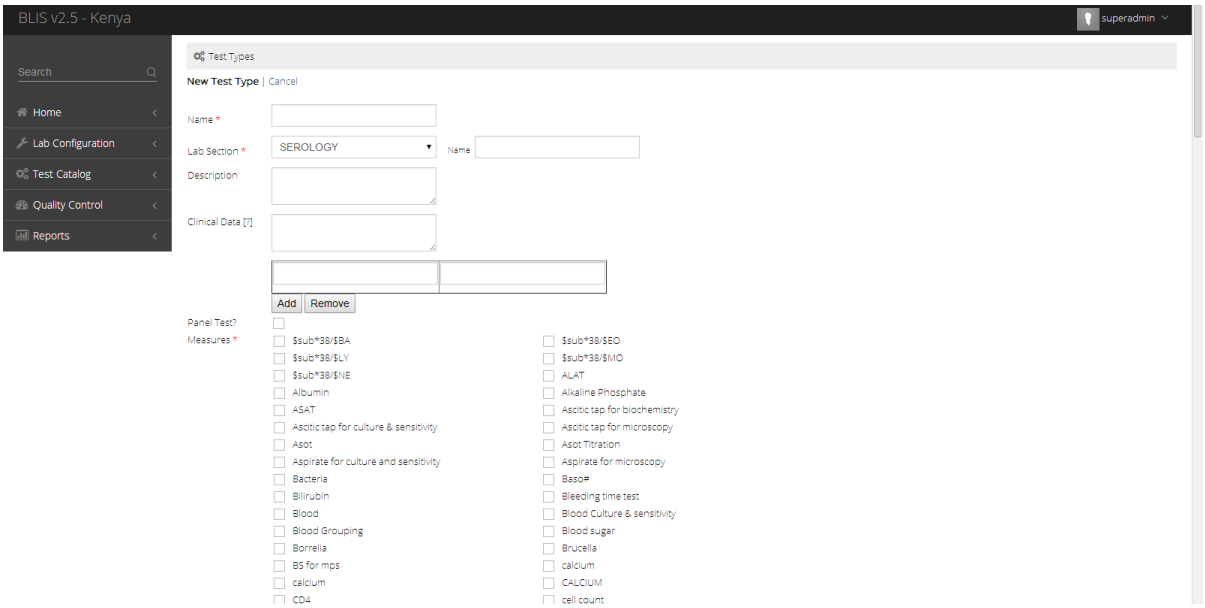
This provides the option to add a new section. Click Add New to add a new section, Submit to save and Cancel to discard. On the right of the section list click **Edit** to make changes and **Delete** to remove the section



Test Types

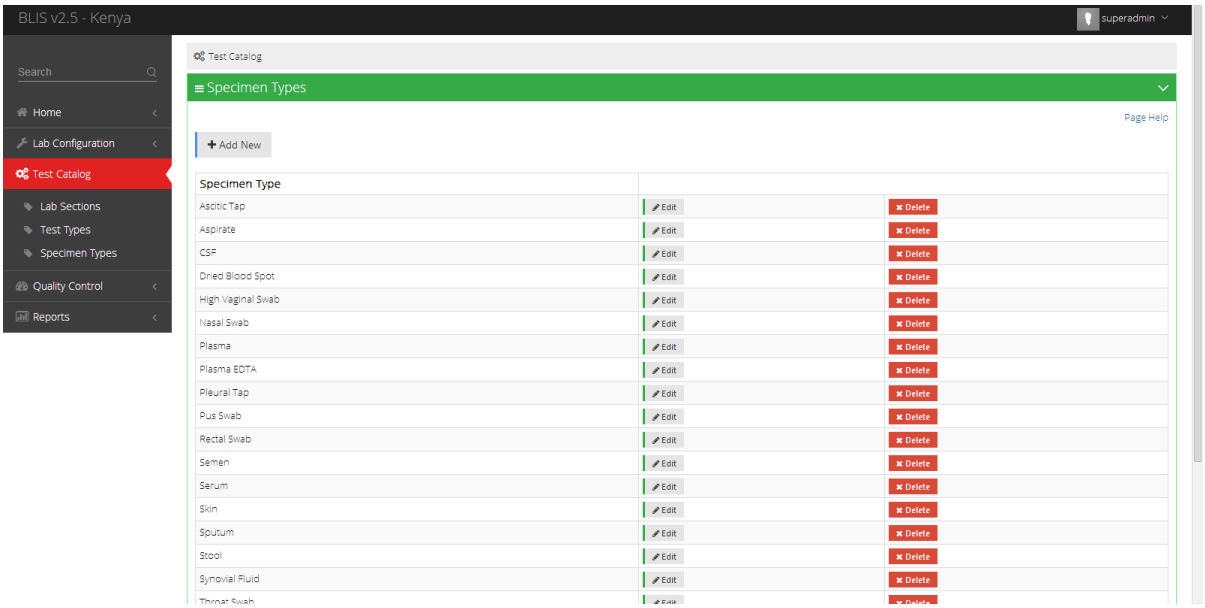
This is the place to add or edit test types used in your laboratory. Click **Add New** to enter a new test type. Required fields are **Name**, which is a text box;**Lab Section**, a drop-down list that includes an option to add a new section; **Measures**, which are editable; and **Compatible Specimens**, which allows you to check one or more specimens that can be used for this test. Optional fields include **Description** (text box), **Clinical Data**, **Panel Test** (a check-box, checked for Yes), **Hide Patient's Name in report** (drop-down Yes/No), **Prevalence Threshold** (text box), and **Target TAT** (text box). To edit the information about a test type, find the one you wish to edit on the list and then click the **Edit** link in the far-right column. Click **Submit** button to save changes, **Cancel** to discard.

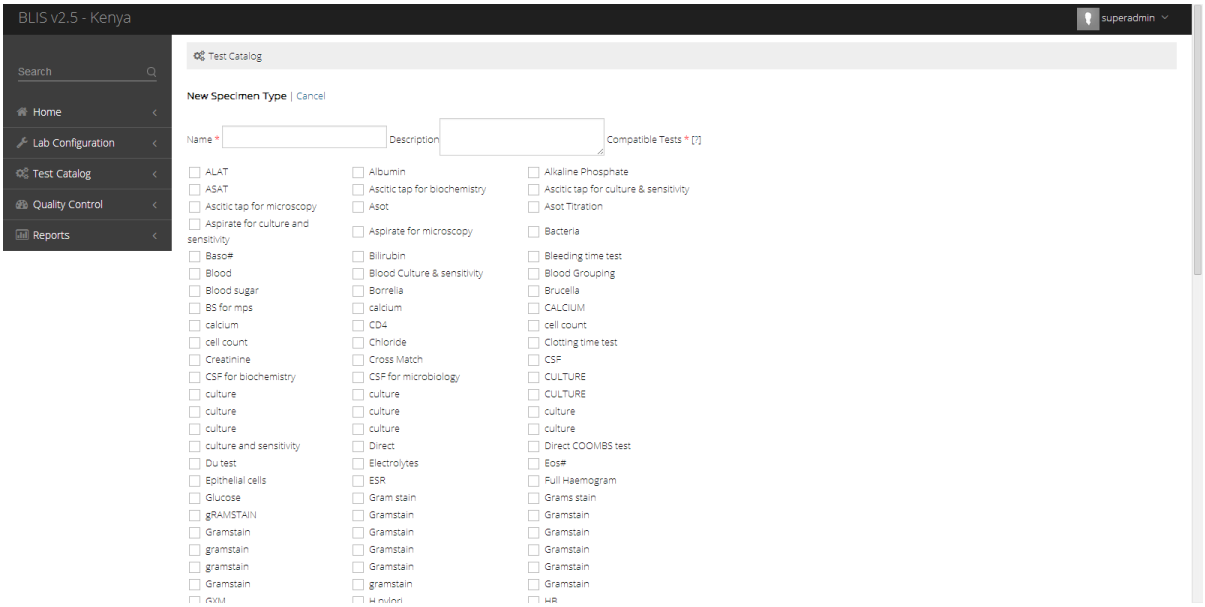




Specimen Types

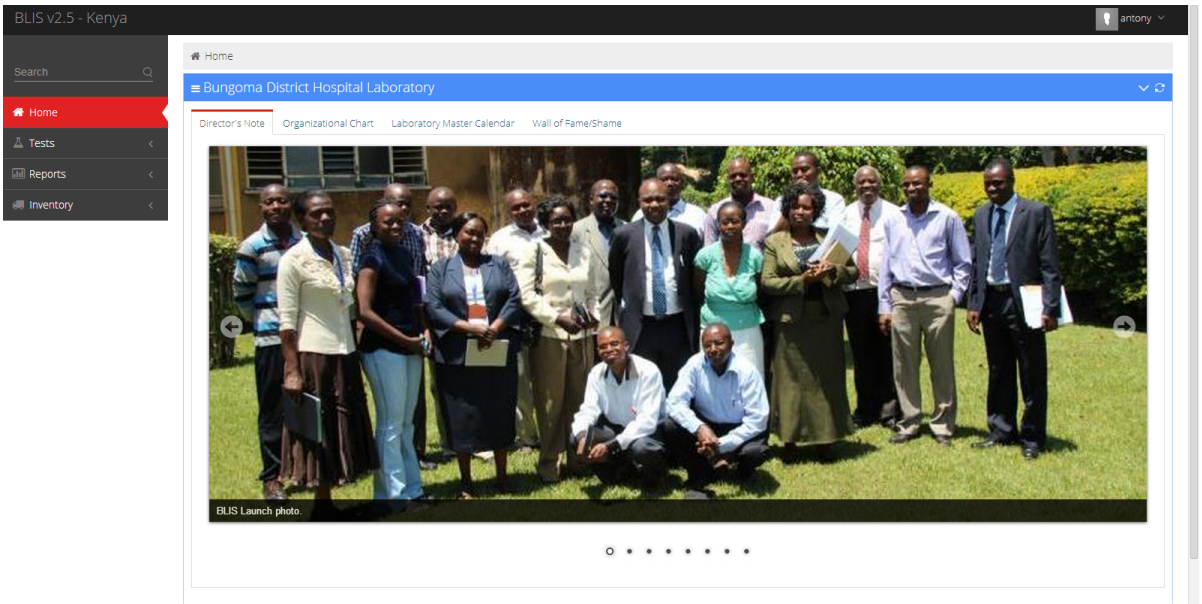
This is the place to add or edit specimen types used in your laboratory. Click Add New to enter a new specimen type. Required fields are Name, which is a text box for entering the name of the specimen, and Compatible Tests, which allows you to check the tests that can be performed using that specimen. Ctrl-F opens the Find function to search for a test. You may enter a Description of the specimen type, which is optional. To edit the information about a specimen type, find the one you wish to edit on the list and then click the Edit link in the far-right column. Click Submit button to save changes, Cancel to discard.



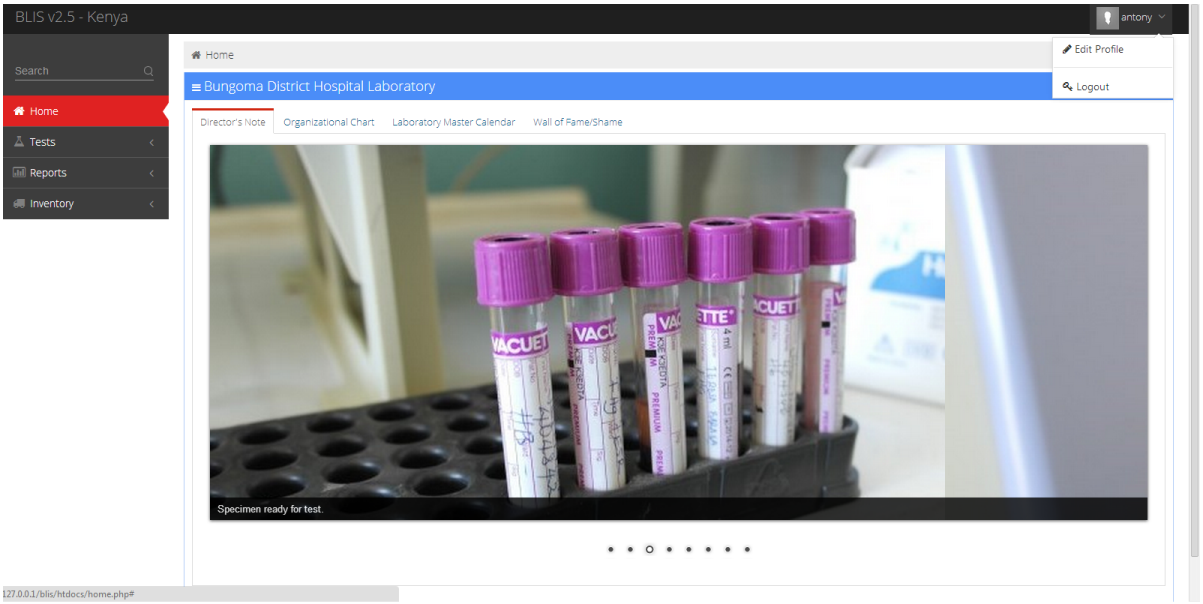


Technician Overview

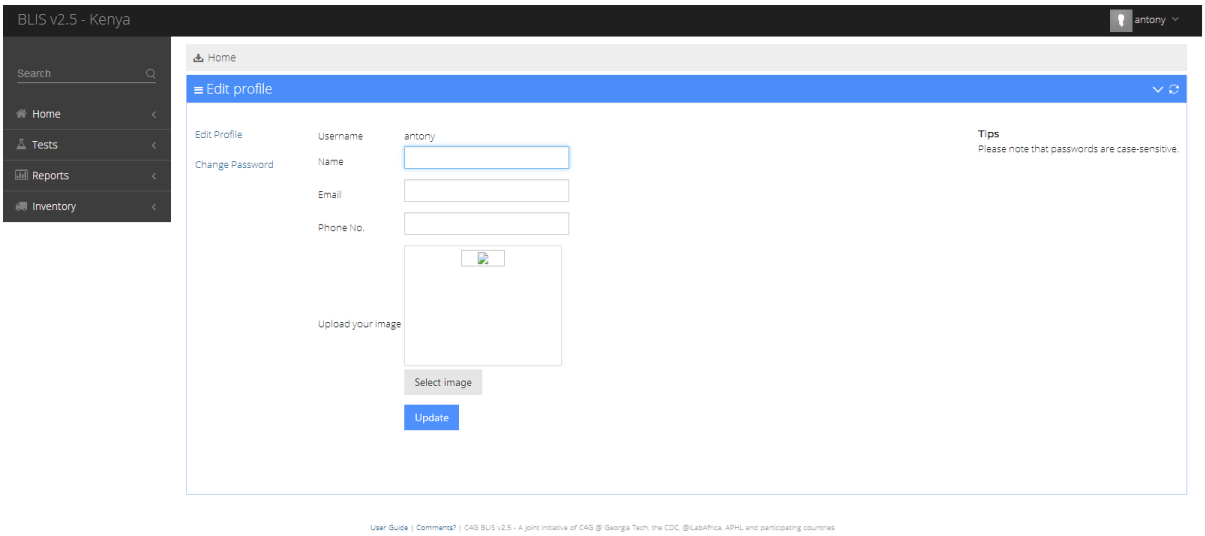
When you log in as a technician, you see this home page:



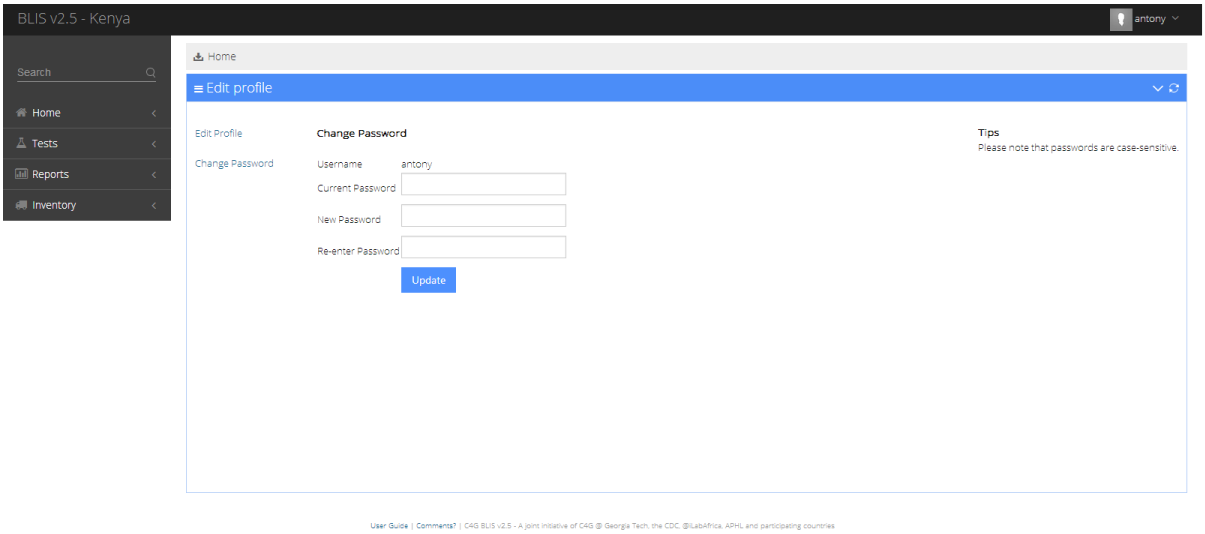
Users with Technician rights can edit your profile to add or change email, phone, and profile picture. Username cannot be changed. Hover on the top right side of the top bar where you see your username e.g. Wasike. Click on the username to open a dropdown menu with ‘Edit profile’ and ‘Logout’ items as shown.



Once you click on 'Edit profile', you'll get the following form



Update your details as appropriate and click on the 'Update' button To change your password, use the 'Change password' link on the 'Edit profile' form as shown.



Fill in the form carefully and save the changes using the 'Update' button. Do not share your password with anyone else and please do not forget your password.

Reports

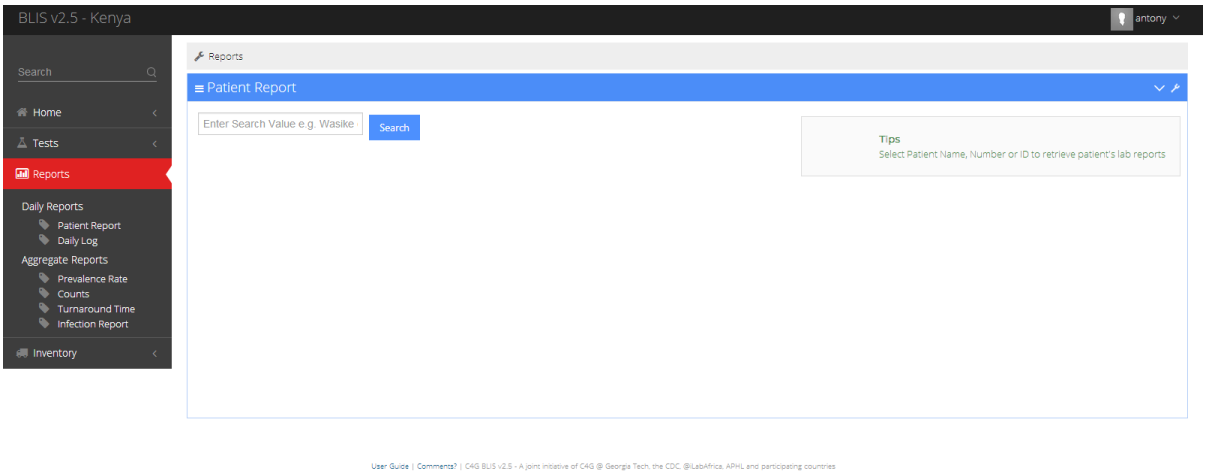
Any user (Technician or Manager) can generate reports.

Daily Reports

The Patient Report and Daily Log should be run every day.

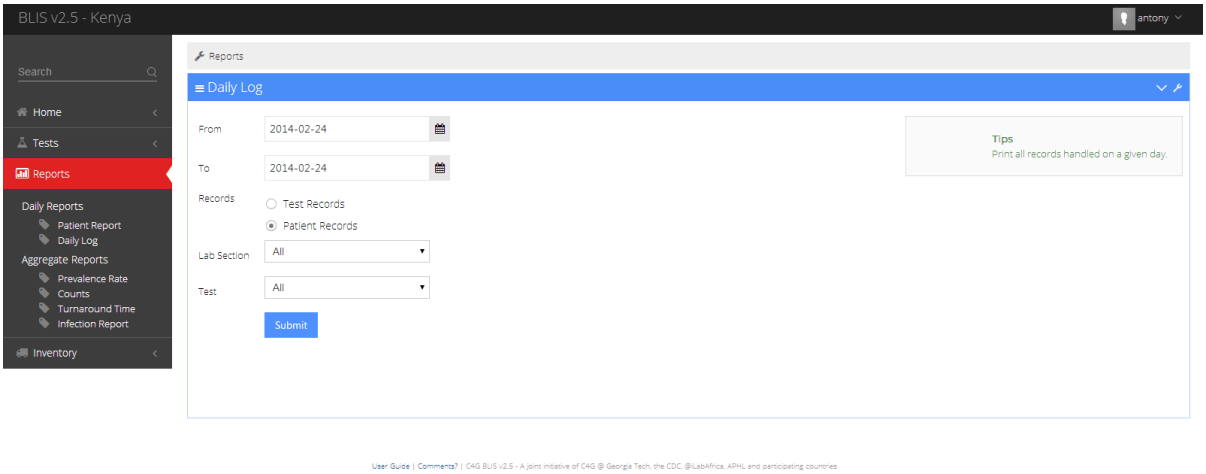
Patient Report

Search for the patient by Patient Name, Patient Number, or Patient ID. Click the Search button to start search. Select the patient you want from the list if more than one patient matches your search criteria. Click **View Report** to see all data for that patient, or Select **Tests** to see tests ordered and the results for that patient. You can edit the report to show activity within a date range, include pending tests for which results are not available, set printing information, or export to Word using the controls at the top of the page.



Daily Log

Set the date range to reflect the log to print. You can run a report of the day's activity by patients seen (by clicking **Patient Records**), or by tests run (by clicking **Test Records**). If you choose Test Records, You can choose to run a log for one lab section or for one type of test. The default settings are test records, all sections, and all tests. The report opens in a new browser tab and has **Print** and **Export** controls at the top of the page.



Aggregate Reports

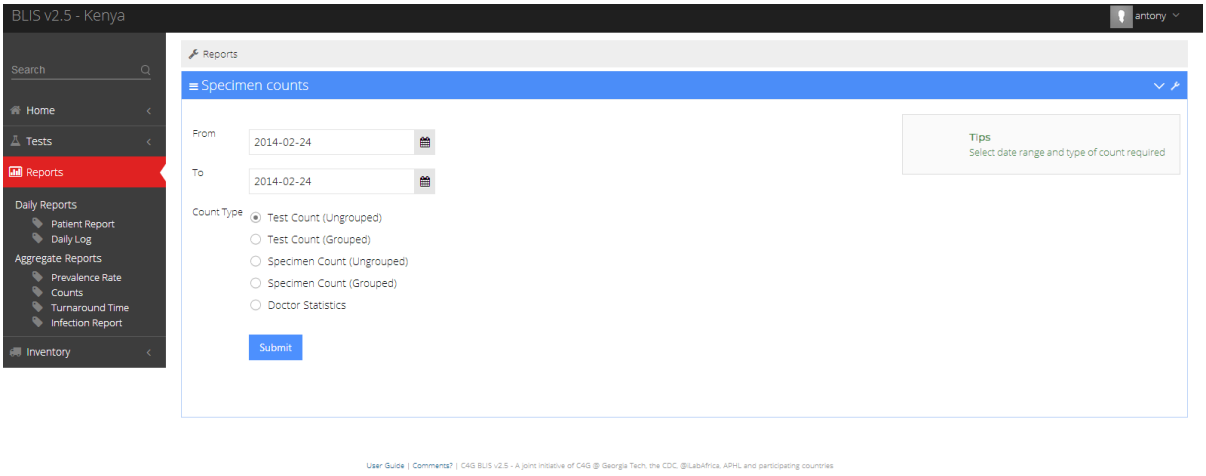
Prevalence Rate

Gives the prevalence of a particular laboratory test result based on the number of tests done and the results. Set a date range to view infection graph and prevalence rates. Click **Submit** to run the report, which will

open in a new browser tab. You can also view the trends of the laboratory test results for the defined period, as a graph, by clicking the **Trends** option after the report is displayed.

Counts

Generates a report for a particular time period of the number of tests, specimens, or doctor statistics. Set a date range and choose **Test Count**, **Specimen Count**, or **Doctor** Statistics to run the desired report.

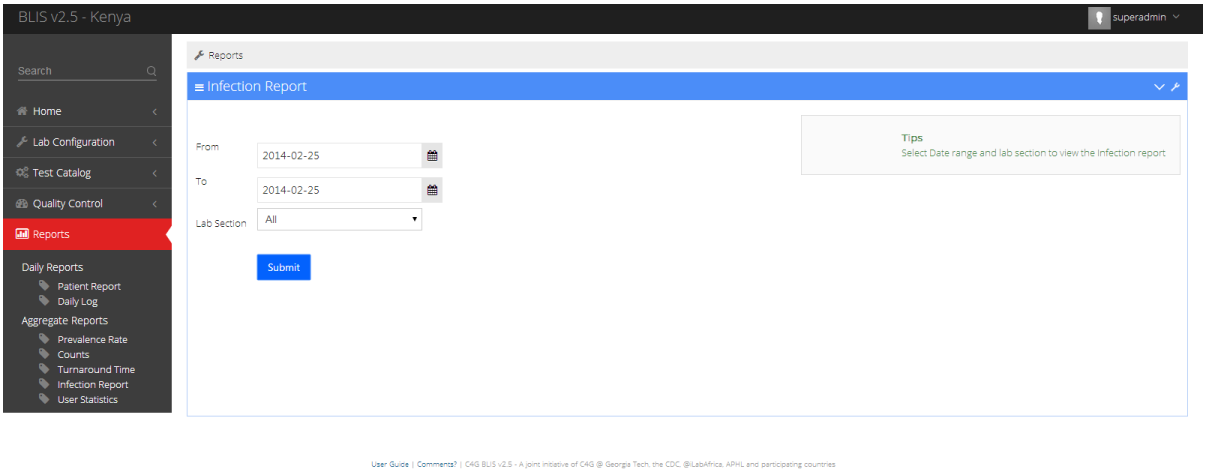


Turnaround Time

Allows you to see actual turnaround times between test order and completion for all or specific tests. Set a date range and choose whether to include **Impending Tests**. The default is completed tests only. It also generates a graph of the statistics.

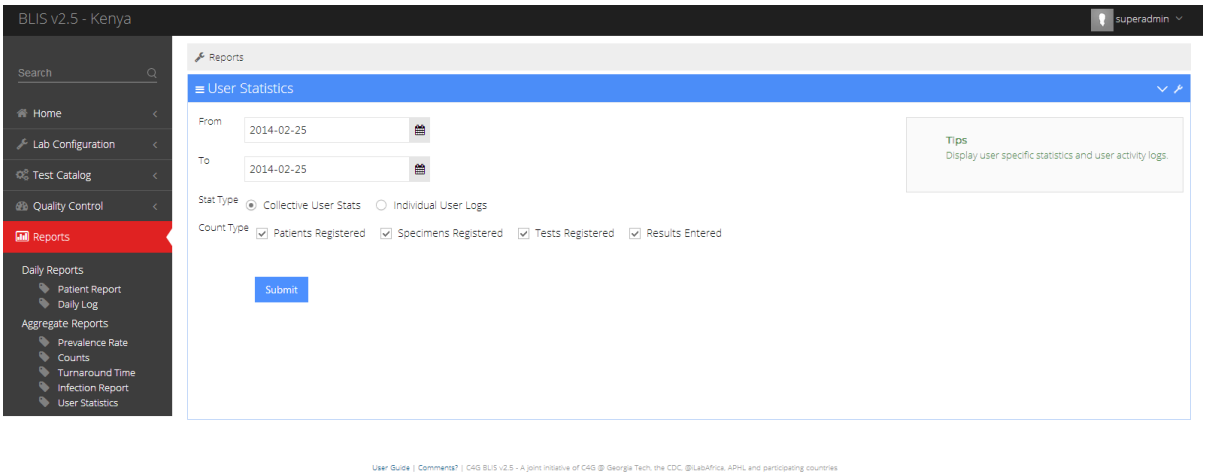
Infection Report

Allows you to generate reports of infections by patient age and gender. Set a date range and select one **Lab Section**, or all sections to see all test results. The report opens in a new browser tab. It also provides an option to create a Word document of the generated report.



User Statistics

Provides user report for a particular time period. For Collective User Statistics Click **Collective User Stats** then use check boxes; **Patients Registered**, **Specimens Registered**, **Tests Registered** and **Results Entered** to determine the report content. And for Individual User Logs Click **Individual User Logs** and use the check boxes to determine the report content. Submit to get a report



Appendix

Glossary

Admin – Designation for a user that has control over lab configuration settings

Aggregate – Type of report that collects data over a period of time and presents it to the user

Barcodes – Used in inventory management to create printable 'barcode' labels for reagents

Director – Designation for a user that oversees many laboratories, typically at the country level. Manages lab configuration standardization

Grouped Reports – Reports that cover multiple types of information.

Inventory – Interface for managing reagents and supplies

Lab Configuration – Collection of customizable settings relating to the collection and storage of data

Manager – Another name for an Admin user

Patient – Entry for a patient whose specimens tests are performed on

Prevalence Rate – The percentage rate of occurrence of a particular result of tests

Reagent – Term used in inventory control in BLIS. Denotes any physical supply that requires tracking in the inventory system

Registration – The act of entering a patient into the BLIS program. Creates a unique patient entry that can be associated with specimens and tests

Reports – Pages that collect metrics for various types of data. The scope of these reports varies from individual patients to entire groups of laboratories

Results - The recorded outcome of tests performed on specimens

Specimen – An entry representing a physical specimen or reading taken from a patient.

Specimen Type – Classification for different types of specimens

Technician – A designation for a user who is tasked with entering data into BLIS

Test – An entry representing a test or reading taken from a specimen

Test Type – Classification for different types of tests.

Turnaround Time – A measurement of the time it takes to receive a result, once a specimen is collected.

User – Any person or entity that logs into the BLIS program

Verify – An action performed on test entries that validates the results for further use

Worksheet – Customizable, printable sheets for improving the speed at which information is recorded in a physical sense (i.e. not entered directly into the BLIS program.)