User manual
For
Web Based MIS for Drug Resistance Tuberculosis and Laboratory Information System

1. DHIS2 Introduction

DHIS2 is a tool for collection, validation, analysis, and presentation of aggregate and patient based statistical data, modified to integrated health information management activities. It is a generic tool rather than a pre-configured database application, with an open meta-data model and a flexible user interface that allows the user to design the contents of a specific information system without the need for programming. DHIS2 is a modular web-based software package built with free and open source Java frameworks.

DHIS2 is open source software released under the BSD license and can be obtained at no cost. It runs on any platform with a Java Runtime Environment (JRE 7 or higher) installed. DHIS2 is developed by the Health Information Systems Programme (HISP) as an open and globally distributed process with developers currently in India, Vietnam, Tanzania, Ireland, and Norway.

The development is coordinated by the University of Oslo with support from NORAD and other donors. The DHIS2 software is used in more than 40 countries in Africa, Asia, and Latin America, and countries that have adopted DHIS2 as their nation-wide HIS software include Kenya, Tanzania, Uganda, Rwanda, Ghana, Liberia, and Bangladesh. A rapidly increasing number of countries and organisations are starting up new deployments. The documentation provided herewith, will attempt to provide a comprehensive overview of the application. Given the abstract nature of the application, this manual will not serve as a complete step-by-step guide of how to use the application in each and every circumstance, but rather will seek to provide illustrations and examples of how DHIS2 can be implemented in a variety of situations through generalized examples.

2. Requirements at users end

a. Working Internet Connection
b. A PC with modern browser (preferably Google Chrome or Mozilla Firefox)

3. DRTB tracking and TB Laboratory Information System Introduction

The Web-Based Management Information System for Multi Drug Resistant Tuberculosis Patient, for the purpose of effective management and monitoring of DR TB patients, the proposed system is aimed to automate the patient tracking and some analytical and report generation tasks in DR TB management program.

The proposed system Amis to store essential information about the patients and other data related data and track the DR TB patients. It will help the health care workers to

record the data and generate summary of the registered patients as per requirements. Also it helps to keep track of routine tests performed on a particular patient, which helps NTCto analyze the Laboratory and MDR patient's data.

The system also features the complete laboratory information system including Microscopy, Culture/DST,GeneXpert and LPA and update laboratory test result via SMS

With regular data update, it will improve the recording and will help in obtaining realistic reports at different level. It will reduce the errors in recording and reporting system of DR TB. Additionally, real time/automatic updating dashboard offered by the system will enable program managers to evaluate the overall DRTB management program at various level.

The system is aimed to be implemented in the National Tuberculosis Programme of Nepal. A health care staff in a clinic to a doctor at the central level can utilize this system. A low level staff can use this system to do his/her daily work of registering the patients and updating their regular information and create reports with ease. High level doctor at central level can use this system to view the summary of patient to analyze the status and take necessary actions. Once the system is put online, the system can be used where internet connection is available.

Strengthening DHO/DPHO and DR TB Treatment Centers to assume responsibility for providing information to the concerned health institutions at districts and higher authority regularly and keep track of updated patient information and also to improve the overall treatment and follow-up procedures.

As the regular process will update the data, it will improve the recording and will help in obtaining realistic reports at different level. It will reduce the errors in recording and reporting system of DR TB. Hence the system will improve the recording and reporting system of NTP specially DR TB management and Laboratory.

Core System Functionalities

After completion of this project NTC expects a comprehensive web based DR TB software that is specifically designed for recording and reporting for DR TB patients.

- Ability to report, analysis and dissemination through dashboards of data for DR TB management
- Able to track DR TB patients and show real-time data about their treatment stage, progress and status.
- Send notification through SMS to registered patients when required

- Allow record and report the test reports of various tests including microscopy, GeneXpert, Culture/DST, LPA
- Send and receive SMS notification of GeneXpert test result
- Export data in excel or other formats as required
- Role based access to the users of the system

4. Lab Register introduction

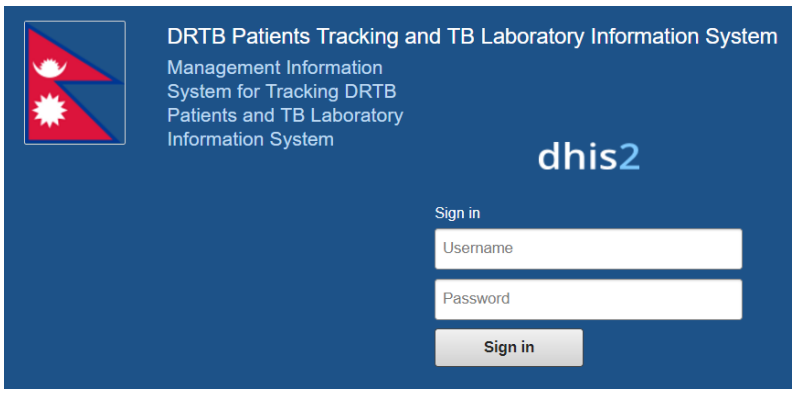
Laboratory register is included in the system which is aimed to be implemented at district level and used by DLS to update laboratory register of each microscopy center within the districts.

5. Accessing the system

National Tuberculosis Center will provide an URL (a web link) to access the system. You just need to visit the provided URL using a modern web browser. The default login screen will appear for you to login.

6. Logging into the system

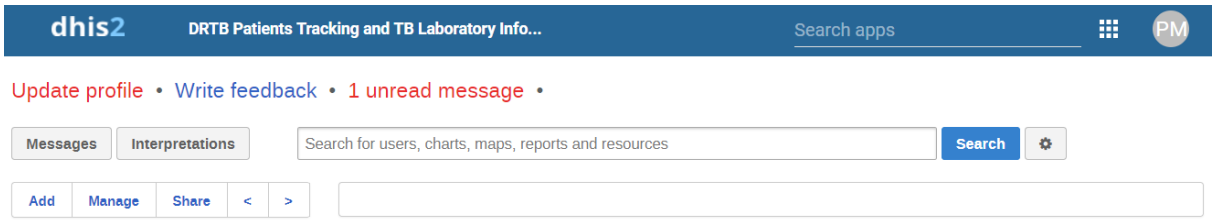
You need a username and password to log in to the system. The username and password will be provided by NTC.



Once you have username and password, just type in the respective text box and click on 'Sign in'. If details that you entered are valid you will be redirected to another page.

7. Dashboard, Apps and User profile

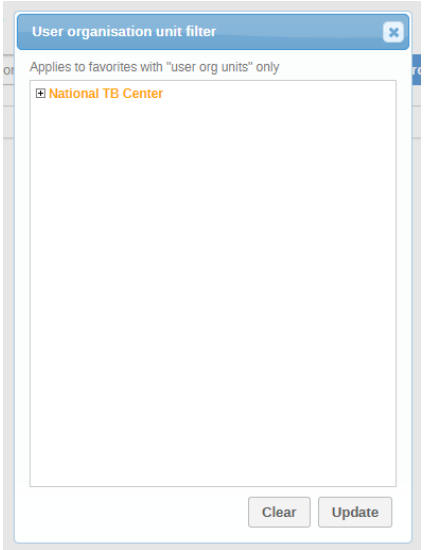
If your credentials are valid, you will be redirected to the dashboard page as displayed below.



Generally initial dashboard will be empty. But NTC or other users may create some dashboard items and share with you. In such case you will see some dashboard items automatically.

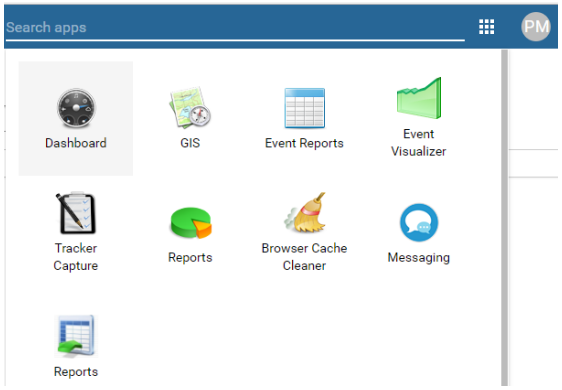
Setting you facility:

To see some charts and tables you need to set your organization unit. To do so, click on the cog icon next to 'Search' button and select your facility then click 'Update'. Selection could be confirmed by its color (orange) and bold. Refer to the image below.



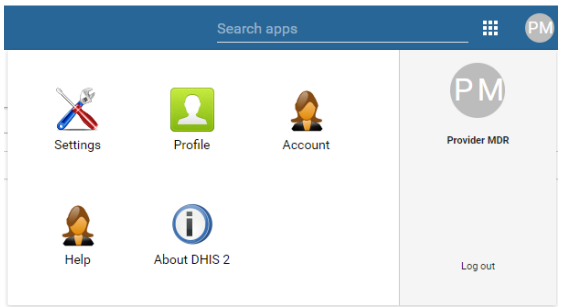
Apps Menu:

Apps menu contains all the applications you need to use. Click on the 'Search Apps' text or apps icon on the top left part of the screen. This will provide you the list of available apps. Details of each apps will be described in later sections.



User Profile:

On the top left corner of the screen, you will notice the initial letters of your name. Just click on it to see all apps and links related to your profile.



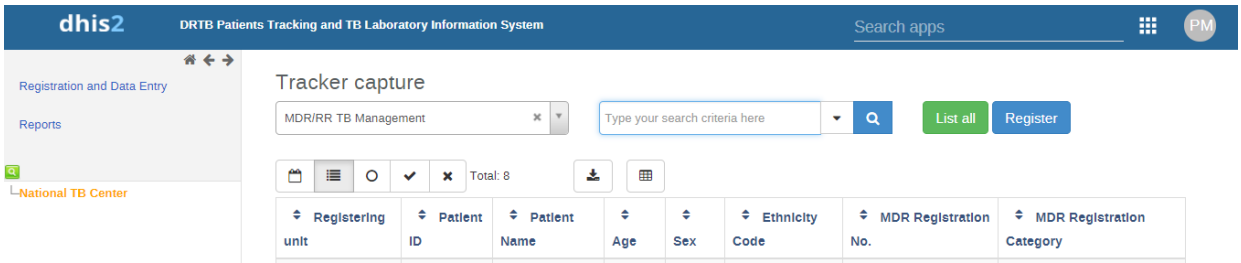
You can use the apps and links displayed here to modify the settings, update your information and change password.

Logging out from the system:

To logout from the system, just click on the 'Log Out' link just below your name.

8. Tracker Capture App Introduction

Tracker Capture app allows you to use all the patient tracking systems. You can view the list of patient tracking systems inside this app. The list you will see depends upon the role you are assigned. That means you only see the list assigned to you and your health facility. To enter the Tracker Capture app, locate on the apps menu and click. When you enter the tracker capture app, you will see the following page by default.

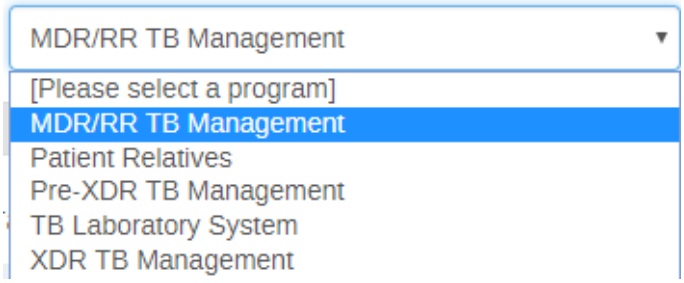


The left panel will present a link to built-in reports and a list of health facilities. If you are associated with a single health facility, you will see it immediately but if you are associated with upper level in hierarchy such as district or province, you will see all lower level units. You must make sure that you select the appropriate unit to start working.

The right panel displays the selected program, patient search toolbox, 'List all' button and 'Register' button.

If you have applied some search and want to view the default list, click on the 'List all' button.

A list of available programs will be presented in a dropdown list based on your role. Click on the dropdown to expand the list and select the program you want to work with.



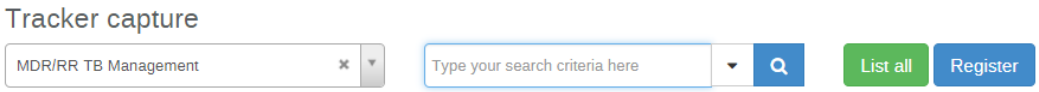
a. Using DR TB management program

To work with a DR TB management program, just click the appropriate program from the list (MDR/RR TB Management or Pre-XDR TB Management or XDR TB Management).

Selecting a program from the list gives you the list of already enrolled patients.

Registering a new patient:

If you want to enroll a new patient in the program, just click on the 'Register' button.



Registration form will appear as follows:

Profile

Patient ID *	1127441
Patient Name *	
Age *	
Sex *	Select or search from the list
Ethnicity Code	Select or search from the list
Height (Cm)	
District	Select or search from the list
Municipality	Select or search from the list
Ward Number	
Contact Number	
MDR Registration No. *	
MDR Registration Category *	Select or search from the list
Regimen Used *	Select or search from the list

Save and continue | Save and add new | Print form | Cancel

Fields marked with * (red asterisk) are mandatory.

After filling all the data fields, click 'Save and continue' button which will lead to the patient dashboard page.

On the left side of the Tabular Data Entry widget, a list of stages is displayed. Each stage is completed at various intervals.

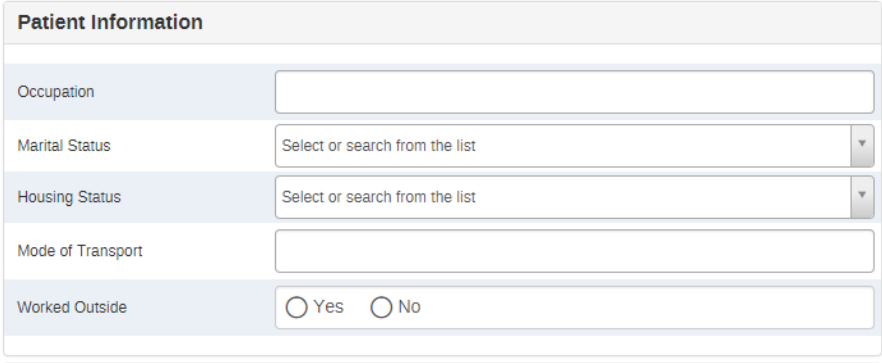
Registration stage is completed at the time of registration
Previous Treatments stage is completed at the time of registration
This is repeatable stage. It consists of 3 treatment stages of patient, Intensive phase I, Intensive phase II and Continuation Phase.
For Intensive Phase I, it should be completed at the time of registration. Once the Intensive phase is completed,

system automatically scheduled for next update.

DST is usually completed when the DST result is available
Monthly monitoring is generally completed every month during intensive phase and bimonthly during continuation phase. A detail for 0 month is completed at the time of registration. Later the system automatically schedules the next update.
Outcome stage is completed after the treatment of the patient is completed or the patient is switched to other treatments. System asks you to complete the enrollment when you complete the outcome stage, do agree and click on the complete enrollment.
Patient transfer stage is completed when the patient is required to transferred out or in

Clicking on each stage will load the respective forms. Data is automatically saved when focus is out from any data field. 'Complete' button in each stage sets the status of the stage as completed.

Registration Stage:



Previous Treatments

Isoniazid Received	Select or search from the list
Rifampicin Received	Select or search from the list
Amikacin Received	Select or search from the list
Amx/Clv Received	Select or search from the list
Capreomycin Received	Select or search from the list
Cipro/Levo/Oflox Received	Select or search from the list
Clarithromycin Received	Select or search from the list
Clofazimine Received	Select or search from the list
Cycloserine Received	Select or search from the list
Ethambutol Received	Select or search from the list
Ethionamide/Prothionamide Received	Select or search from the list
Kanamycin Received	Select or search from the list
Other Drug Received	Select or search from the list

Patient HIV Status

HIV test at registration	◉ Yes ○ No
HIV test type	
HIV test result	Select or search from the list

Patient Medical History

Alcohol History	Select or search from the list
Intravenous (IV) drug use	Select or search from the list
Tobacco Use	Select or search from the list
Cirrhosis/active hepatitis	Select or search from the list
Cardiovascular disease	Select or search from the list
Diabetes mellitus	Select or search from the list
Chronic renal insufficiency	Select or search from the list
Gastritis/gastric ulcer	Select or search from the list
Seizure disorder	Select or search from the list
Psychiatric disorder	Select or search from the list
Prior TB surgery	Select or search from the list

Previous Treatments Stage:

- Registration
- Previous Treatments
- Treatment Phase
- DST
- Monthly Monitoring
- Outcome
- Patient Transfer

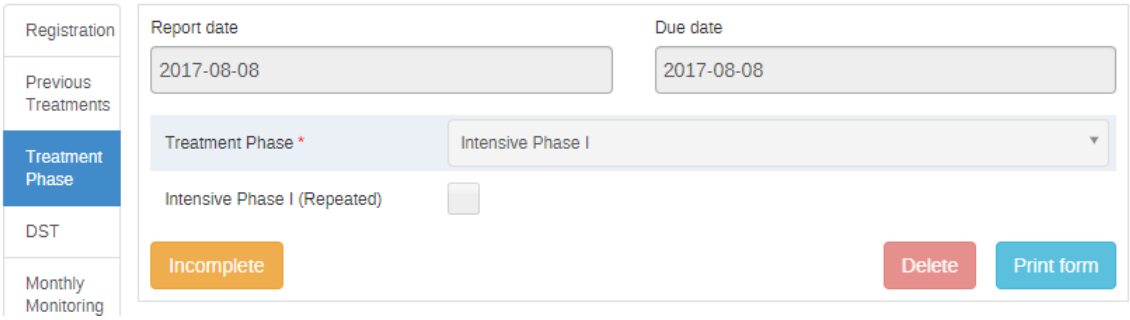
Date: 2017-08-21

Due date: yyyy-MM-dd

Date of Previous Treatment	yyyy-MM-dd
Duration of previous treatment (month)	
Initial smear	Select or search from the list
Treatment regimen (use drug abbreviations)	
Treatment centre	[Please select]
Smear status at end of treatment	Select or search from the list
Culture status at end of treatment	Select or search from the list
Condition at end of treatment	Select or search from the list

Complete | Delete | Print form

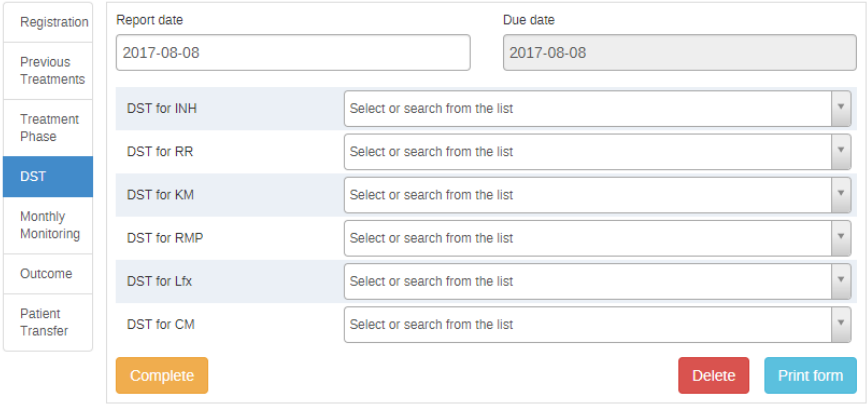
Treatment Phase Stage:



Treatment phase stage is repeatable stage. To add a new event on this stage, click on the '+' button on the right side of the widget as displayed on the right.

The 'Calendar' button is for scheduling a new event for later date but scheduling is automatically done by the system, so we rarely need scheduling.

DST



Monthly Monitoring:

Followup Date	Due date
2017-08-08	2017-08-08

Followup Info

Followup Month	Select or search from the list
Weight (kg)	

Smear and Culture

Lab Center	
Lab Number	
Result of Smear Examination	Positive
Culture Result	2 Colonies

Other Tests

RFT Result	

Side Effects

Nausea/Vomiting	☐
Diarrhoea	☐
Arthralgia	☐
Dizziness/vertigo	☐
Hearing disturbances	☐
Vision Problem	☐
Signs of hypothyroidism	☐
Minor mood changes or insomnia	☐
Depression	☐
Suicidal thoughts	☐
Hallucinations/psychosis	☐
Urine output	☐
Itchy skin	☐

Outcome

Outcome date: 2017-08-13
Due date: 2017-08-13
Treatment Outcome * : Select or search from the list
Shifting Reason * : Select or search from the list
Complete | Delete | Print form

Patient Transfer

Registration
Previous Treatments
Treatment Phase
DST
Monthly Monitoring
Outcome
Patient Transfer

Transfer Date: 2017-08-21
Transfer: Select or search from the list
Transfer to: Select or search from the list
Complete | Delete | Print form

Your note here
Add | Clear

Patient Reports

Report

MDR/RR TB Management	Program Report	DR Register

Report widget provides the links to the standard patient reports.

Updating existing patient:

If you want to update the information of the existing patient, you can apply search and click on the patient row. This will take you to the patient dashboard with all available stages. Pick required stage and modify data as required.

Incomplete

If any event that is already completed, editing may not possible until you click on the 'Incomplete' button.

After modifying the data, click on 'Complete' button.

b. Using TB Laboratory System

Laboratory system is used at TB laboratories. This program has 2 stages. Enrolling a patient is similar as done in DR TB management programs. Patient will have the same attributes and process follows the same.

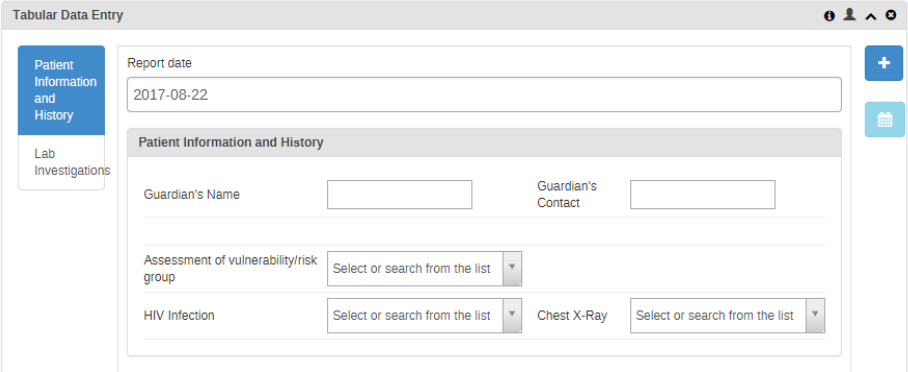
Select the 'TB Laboratory System' from the programs dropdown list. To register a new patient, just click on the 'Register' button.

If patient exists, just apply the search with patient id or patient name. When the matching patient list is displayed, click on the row of the appropriate patient to visit the patient dashboard for laboratory.

In the dashboard, you can enter new data or modify existing. If there is no data entry form displayed but date field is present, select the date which will load the data entry form. In case of no data entry form or date field, click on the '+' button.

TB Laboratory System consists of 2 stages; 1) Patient information and History, 2) Lab Investigations.

Patient information and History



This is non repeatable stage, so data is entered only once in this stage.

Lab Investigations:

'Lab investigations' is repeatable stage. Each time patient visits laboratory for any kind of tests, this stage is completed. Click on the '+' button in 'Lab Investigations' stage to add a new test.

Tabular Data Entry

Patient Information and History

Lab Investigation

Report date

2017-08-22

Sample Details

Type of Sample: Sputum

Test to be performed: GeneXpert

Tuberculosis History: New Suspect

Registration Category: Select or search from the list

Tuberculosis Type: Select or search from the list

Selecting 'Test to be performed' will present the appropriate form for data entry. For example, selecting 'GeneXpert' in 'Test to be performed' will present the following form.

GeneXpert Result

Purpose of GeneXpert Test	Select or search from the list	GeneXpert Number	
Date of test	yyyy-MM-dd	Result (MTB Load)	Select or search from the list
Sputum Smear Result	Select or search from the list	Result	Select or search from the list
		Error Code(if error)	
Remarks			

Complete Delete Print form

Microscopy form:

Microscopy Result

Microscopy Purpose	Select or search from the list	Followup Month	Select or search from the list
Specimen A		Lab Number	
Sputum Type	Select or search from the list	Date	yyyy-MM-dd
AFB Count	Select or search from the list	Result	Select or search from the list
Specimen B		Lab Number	
Sputum Type	Select or search from the list	Date	yyyy-MM-dd
AFB Count	Select or search from the list	Result	Select or search from the list

Complete Delete Print form

Culture Form:

Culture Result

Culture Number		Date	yyyy-MM-dd
Culture Result	Select or search from the list	Scanty	Select or search from the list

Identification Test	Result
PNB	Select or search from the list
Niacin Production	Select or search from the list
Catalase at 68°C	Select or search from the list
Nitrate Reduction	Select or search from the list
Organism Type:	Select or search from the list

Complete Delete Print form

Click on 'Complete' button after filling appropriate form.

View and print report:

Report

TB Laboratory System Program Report DR Register

Click on 'Program Report' from the Report widget on the bottom of the page.
This will show the list of test in tabs for each type of test as shown below.

TB Laboratory System | Active

Patient ID: 1127441		
Patient Name: Dahal Bro	Age: 32	Sex: Male
District:	Municipality:	Ward No:
Contact Number:		

Microscopy GeneXpert Culture DST LPA

Date	Microscopy Purpose	Followup Month	Lab Number (Specimen A)	Sputum Type (Specimen A)	Smear Date (Specimen A)	Smear Result (Specimen A)	Lab Number (Specimen B)	Smear Date (Specimen B)	Sputum Type (Specimen B)	Smear AFB Count (Specimen A)	Smear AFB Count (Specimen B)	Smear Result (Specimen B)	Sputum Sample	Microscopy Result

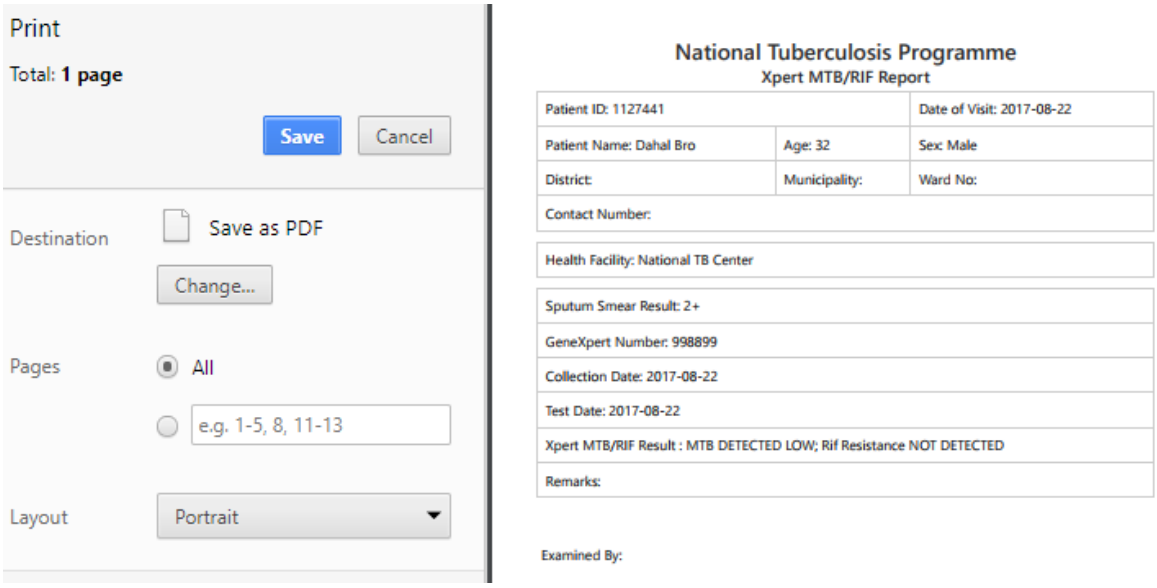
Click on the tab to view and print the result. For example see image below.

Microscopy GeneXpert Culture DST LPA

Date	Purpose of GeneXpert	GeneXpert Test Result	GeneXpert Date	Xpert Error Code	GeneXpert Number	MTB Load	
2017-08-22	DiagnosisOfTB	Rif Resistance NOT DETECTED	2017-08-22		998899	MTB DETECTED LOW	PRINT

If multiple tests for the same patient exists, find the record that you want to print, which could be easily done based on the date.

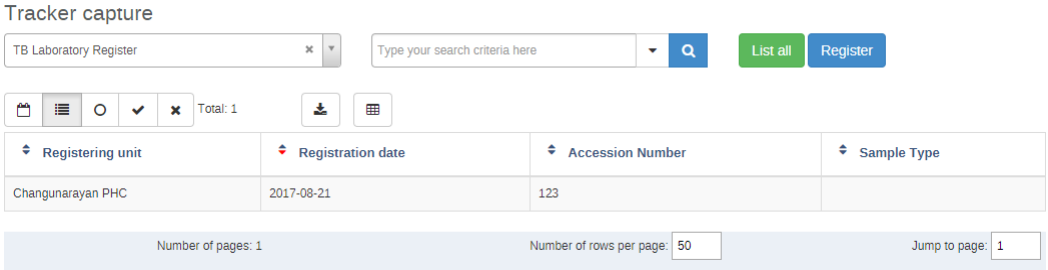
Click on the 'Print' button on the left to see the preview and printing. The presentation of the view depends upon the web browser used. Below image is based on Google Chrome.



Select the appropriate printer and apply additional settings if required before printing.

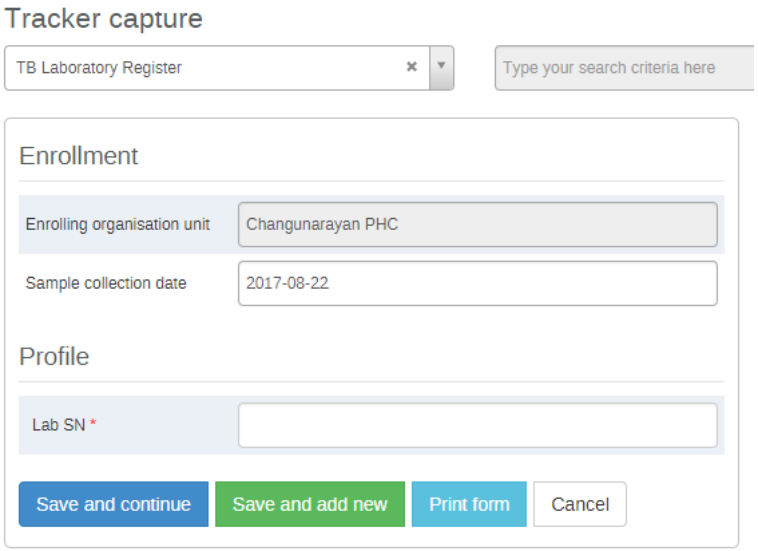
c. Using TB Laboratory Register

TB Laboratory register is used by DLS at district level. To use this program, just select the TB Laboratory Register from the dropdown list as explained in previous sections. The list of existing records will be displayed as shown below.



If you have updated information for existing lab serial number, just apply the search and click on the required row to go to the data entry page.

To add a new record, click 'Register' button on the top left side of the screen as shown above. This will present the registration form as shown below.



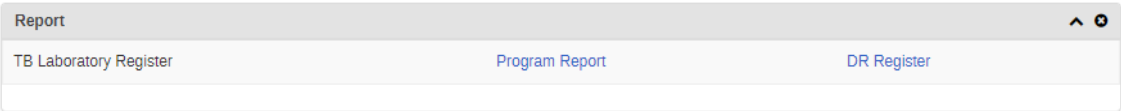
Just enter the 'Lab SN' and click 'Save and continue' to go to the data entry page. Since this program has only one stage, data entry form is available instantly unlike previous sections you required to click on '+' button or enter date field.

Data entry in this program consists of 1) Patient Information, 2) Treatment Center/Referral, 3) Tuberculosis/HIV Status, 4) Purpose of Test, 5) GeneXpert Result and 6) Microscopy Result

All the sections mentioned above are filled at the same time based on the TB laboratory paper register.

Click on the complete button after filling all the data in the form. A message displaying 'Are you sure you want to complete this event and enrollment?' will appear. If all data fields are entered at this time then click on 'complete this event and enrollment' but if data for any field is expected to fill later then click on 'Complete and exit'. Click on 'Ok' in either case.

View TB Laboratory Register:



Click on the 'Program report' in report widget. TB Laboratory Register will be displayed with options to print, export to excel or PDF at the bottom of the page.

9. NTP Reports Introduction

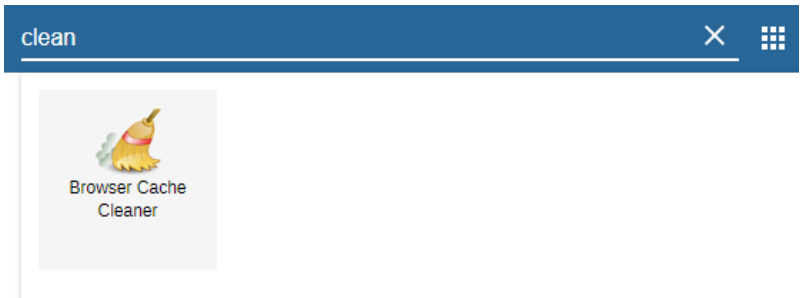
All standard reports are combined in a separate app within DHIS2. Click on apps button and search for 'reports' and select 'NTP Reports' as shown below.

Pick the appropriate report from the page. Each report may require some parameters.

10. Browser Cache Cleaner Introduction

Browser Cache Cleaner app is built-in app within DHIS2. It is used to clean the DHIS2 specific temporary storage (cache) from the browser. DHIS2 uses the browser cache techniques to improve the performance of the developed application. So that some updates in the server may not be available to your browser immediately as browser only looks for the data in its local cache. To clean the browser cache and to make sure that the browser gets the latest updated data from the server this may be useful.

To use the app, click on the apps menu and search for cleaner and select 'Browser Cache Cleaner' app.



Click on 'Select All' then 'Clear'.