United Republic of Tanzania

Ministry of Health and Social Welfare

District Health Information System (DHIS2)

User Manual

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Chapter 1: Introduction to DHIS

1.1. What is DHIS?

DHIS is an acronym for District Health Information Software. The development of this started all the way in 1997 in South Africa. The first version DHIS 1.X was a Microsoft Office application which was distributed freely to users. Tanzania piloted DHIS 1.3 in Kibaha and Bagamoyo around 2003-2005 which Zanzibar has been using DHIS1.4 since the year 2005.

In 2005, based on the various comments and feedback from the field level use, the University of Oslo initiated the process of developing the second version of DHIS. The new version was developed based on the data warehousing principles and modular structure that allows users to work with the functionalities of their need and leave the rest. DHIS 2 is platform independent as in cab be installed and run in any operating system and can run on both on-line (with the internet) and offline (without the internet) modes. It is also a multi-language enabled and integrated with various other applications such as Geographic Information Systems (GIS), Mobile Technologies and Microsoft Excel.

1.1.1. Features in Brief

The DHIS is meant to help the Health Management Teams at various levels in making right decisions based on the information collected. Its features can be summarized using the classical definition of the system which comprises of ***input*** *(*data entered by users*)***,** ***process*** (various analysis to be done in the systems) and ***output*** ***(***different reports and information that can be generated).

1. **Input:** DHIS provides user-friendly interface for users to enter data. The screens for data entry have been designed to imitate the paper forms.
2. **Processes:** DHIS automatically computes sums, indicators and checking the validity of the data to make sure the data entered reflects the reality on the ground.
3. **Output:** Provide different tools for reporting – both for automated routine reports and analysis reports, and in addition provides the user with functionality and flexibility to make their user defined reports.

More DHIS2 features and their details will be found in the subsequent sections of this manual.

1.2. Getting Started with DHIS

1.2.1. Opening DHIS 2

The DHIS2 software is a web-based application and can be accessed through as **web browser** (*an application you use to access internet e.g. Internet explorer, Mozilla Firefox, Google Chrome, Opera, etc*) when you have Internet Connection.

To access the DHIS 2application, Google chrome and Mozilla Firefox are recommended as best browsers. Open DHIS 2

Step 1: Open your web browser

Step 2: In the address field type in the URL (address) of the DHIS2 (www.dhis.moh.got.z), and you will see DHIS 2 login screen

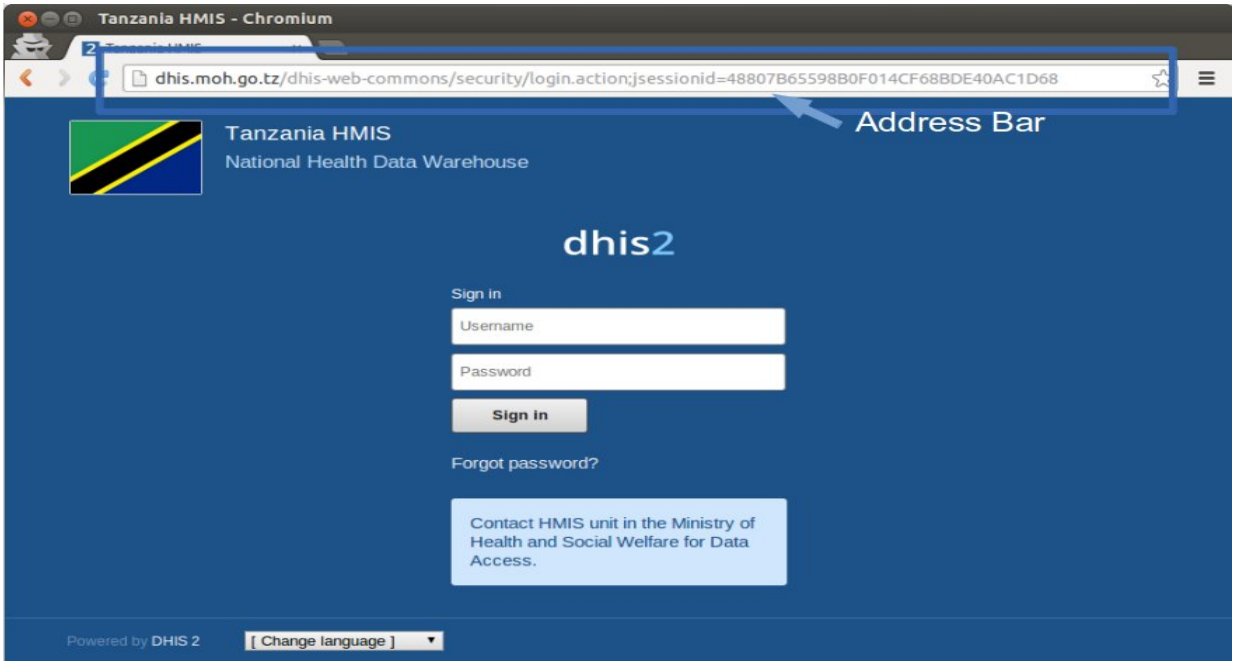

Figure 1.1: Open DHIS 2 on web browser

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1.2.2. Logging in and out

Once you see the blue login screen, you must enter your username and password to login into the application. In case the login is not successful, you will be notified immediately that username or password provided is incorrect and will be asked to re-enter credentials. In

case you don't have access to the system, contact HMIS unit at Ministry of Health and Social Welfare.

Once you have successfully logged in you will see the DHIS Dashboard where you can immediately monitor the latest data in your selected charts and access your favourite DHIS sites (reports, maps etc).

Figure 1.2: Log in DHIS 2 software

When you have finished your DHIS 2 session you are recommended to log out before closing the browser. Use the log out link in the upper right corner and you will be returned to the log in screen.

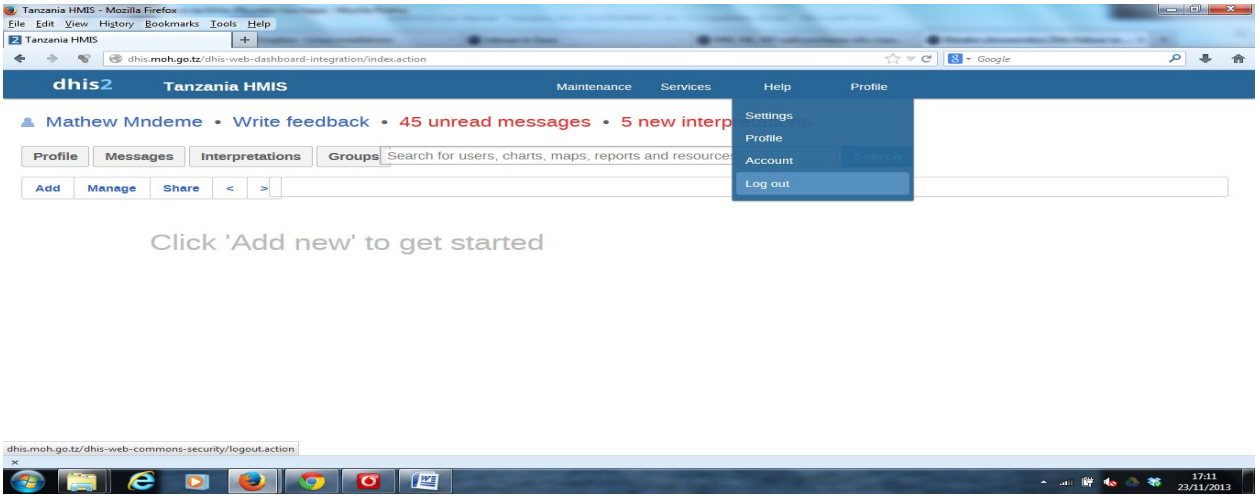


Figure 1.3: Log out of DHIS 2 after finishing using it

1.2.3. Menus and Navigation

The DHIS 2 has two menu systems;

- the **top menu** which leads to the various modules

Figure 1.4: DHIS 2 Top Menu

- The **left side menu** inside most modules to navigate between features inside each module.

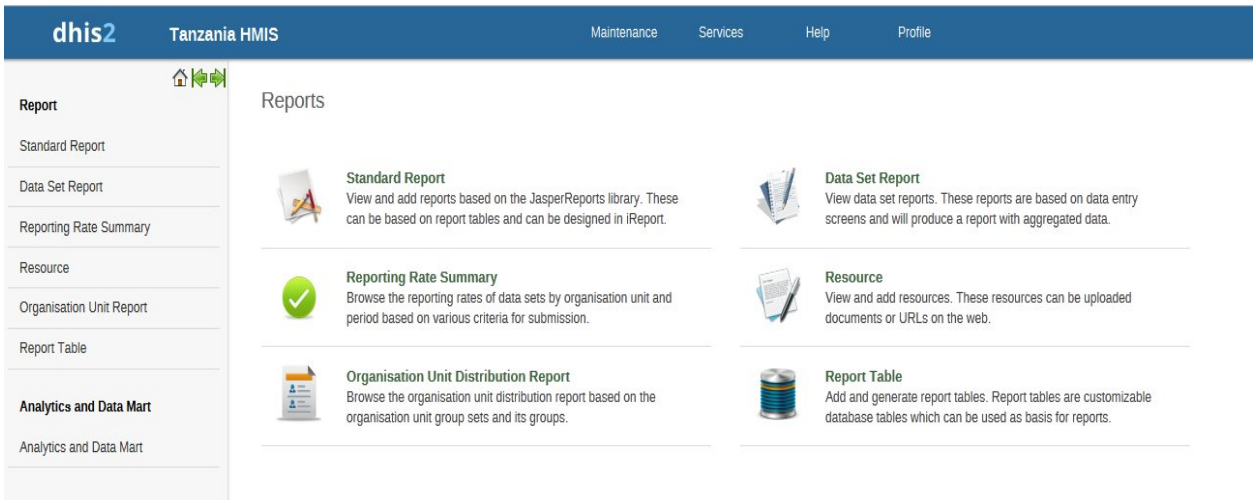


Figure 1.5: Left side Menu in DHIS 2

- The DHIS 2 symbol in the top left corner is a fast link to the user-defined start page, the home page. Often this is set to the dashboard module.
- The **logout button** is found under Profile as a submenu.

a) The Top menu

The DHIS consists of various modules (major components) which each have specific features, such as **Data Entry**, **Reporting**, **Dashboard**, **GIS**, **Mobile, Data Visualizer, Pivot Table** etc. You can access these modules from the top menu either under **Maintenance** or **Services**.

- **Maintenance:** is mostly used by System Administrators that maintain the system and might not be visible, depending on the privilege.

- **Services:** is where you will find the more operational features like **Data Entry**, **Data Quality**, **Reporting, GIS, Data Visualizer and Pivot Table**.
- **Help:** under this menu you can access the built-in user manual, update your user details, or view information about the running DHIS application.
- **Profile:** here you can access and edit your personal information. Use this menu to log out of the system

To move to a new module you need to move the mouse pointer to one of the top menu items; **Maintenance**, **Services**, **Help** or **Profile**. Then a submenu with modules will appear. Click on the module you want to open.

b) Navigation inside modules

When you open most of the modules you will see the module main page which lists the ***major sub-modules*** or features ***in the middle of the screen*** with a short description. Simply click on the feature you would like to open.

When inside a module you will always see the left side menu with links to its features. Use this menu to jump between features.

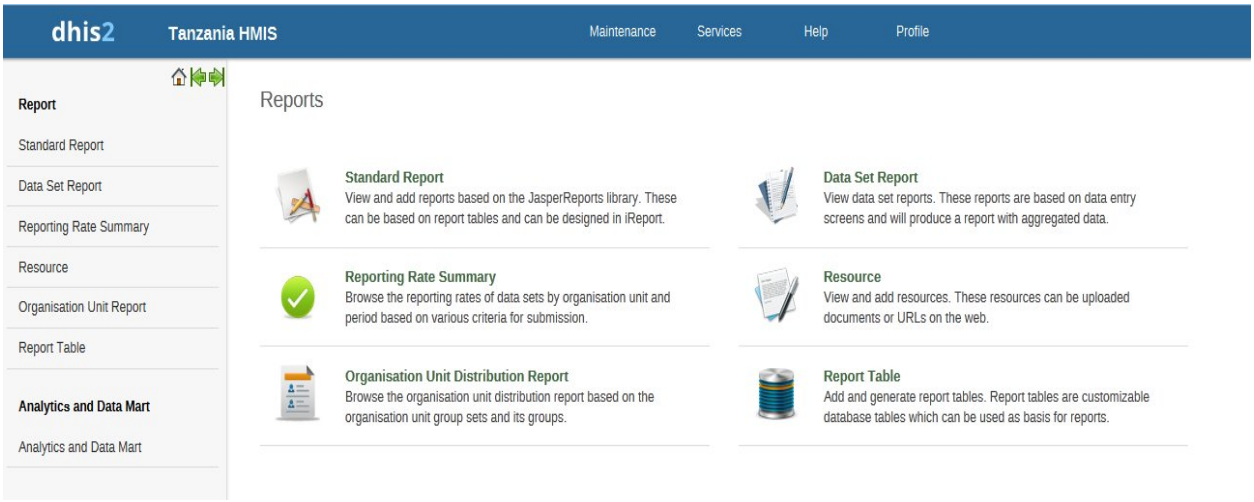


Figure 1.6: Sub-module menu Inside a Module

Note: The data entry and dashboard modules do not have a menu system as they only contain one feature; everything is in one page, so no need for a menu there.

Chapter 2: Data Entry

2.1 Data entry with DHIS 2

To open the data entry window:

- Click on the **services** tab displayed in the main menu. A drop down menu will appear listing the services provided by DHIS 2.
- Click on the **Data Entry** option.

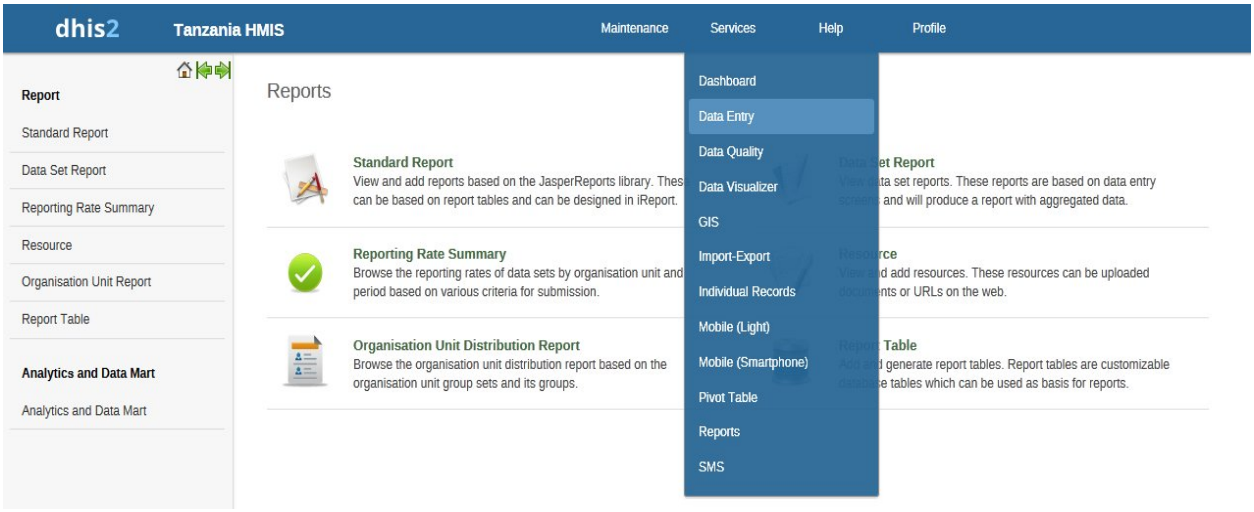


Figure 2.1: Accessing the data Entry Module in the DHIS2

2.2 Entering data

To start entering data, first you should open the correct form. The steps are as follows:

1. Locate the **organization unit** (e.g. 511 JK Gongolamboto Dispensiary) you want to register data for in the tree menu to the left. Expand and close branches by clicking on the **+/-** symbols.
2. Select a **dataset/ data entry form** (e.g. Ufuatiliaji wa Watoto) from the dropdown list of data sets available to your selected **organization**. The datasets, in its simplest, is a form in which data are entered. The number of datasets is therefore equivalent to the number of forms available.
3. Select a **period** (e.g. October 2013) to register data for. The available periods are controlled by the dataset's period type (reporting frequency). You can jump a year back or forward by using the **Prev year** and **Next year** buttons.

By completing above steps, you see the selected data entry form as shown in the figure in the next page

Figure 2.2: Open a data Entry form in DHIS 2

Note the following:

- Start entering data by clicking inside the first field and type in the value.
- Move to the next field using the Tab button. By pressing **Shift + Tab** on your keyboard will take you back one step.
- The values are saved immediately and do not require any save/finished button click.
- A green field indicates that the value has been saved in the system (on the server).
- On a slow connection it might take some time before the values are saved.

2.3 Offline data entry

Once you login into the online DHIS 2 you can continue with data entry even when the Internet connection goes off.

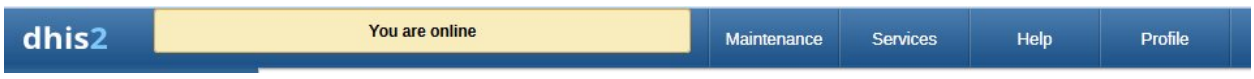
- The functionality works as long as you logged into the system while there wa Internet Connection.
- When the server is able to be reached through the Internet connection, a message is displayed at the top of the data entry screen below.
- 

Figure 2.3: Online Status on the top-Menu Bar

- If you are in data entry form and connection is cut off/unstable, you can still enter data and these data will be stored in your local computer as seen below
- If the Internet connection should disconnect for some reason during the data entry process, this will be detected by the application, and you will be informed that your data will be stored locally
- When internet connection is re-established, all data will be sent to the server (www.dhis.moh.go.tz)
- Once the internet is back, the application detects that the server is back on-line and will inform you that the data is locally stored and that you should upload it to the server

Figure 2.4: Data Stored status on the top Menu Bar

- Once the data has successfully synchronized with the server, you will receive a confirmation message that the data has been successfully uploaded to the server.

Figure 2.5: Data uploaded to server status on the top Menu Bar

2.4 Death Registry Data Entry

To open the data entry window:

- Click on the **services** tab displayed in the main menu. A drop down menu will appear listing the services provided by DHIS 2.
- Click on the **Individual Records** option.
- Under the Data Entry Sub Menu, Click the **Single Event without registration**

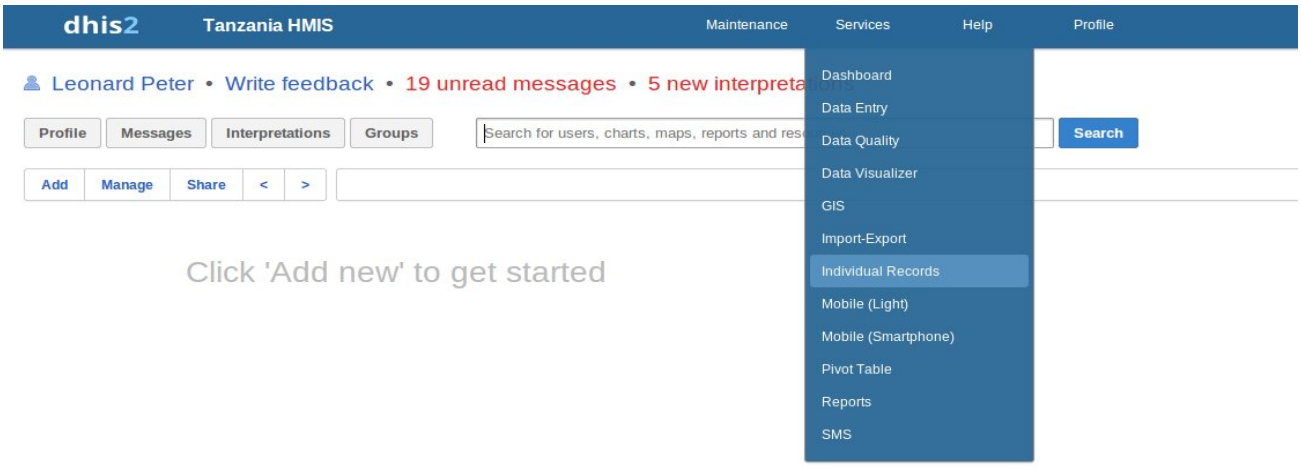


Figure 2.6: Open Individual Records in the DHIS2

2.4.1 Entering Death Registry Data

To start entering data, first you should open the correct form. The steps are as follows:

1. Locate the **organization unit** (e.g. 511 JK Gongolamboto Dispensiary) you want to register death registry data for in the tree menu to the left. Expand and close branches by clicking on the **+/-** symbols.
2. Select a **program/ data entry form** (i.e. Death Registry) from the dropdown list of programs available to your selected **organization**.
3. If there are death registry data for that facility, a list of data will be listed as shown below

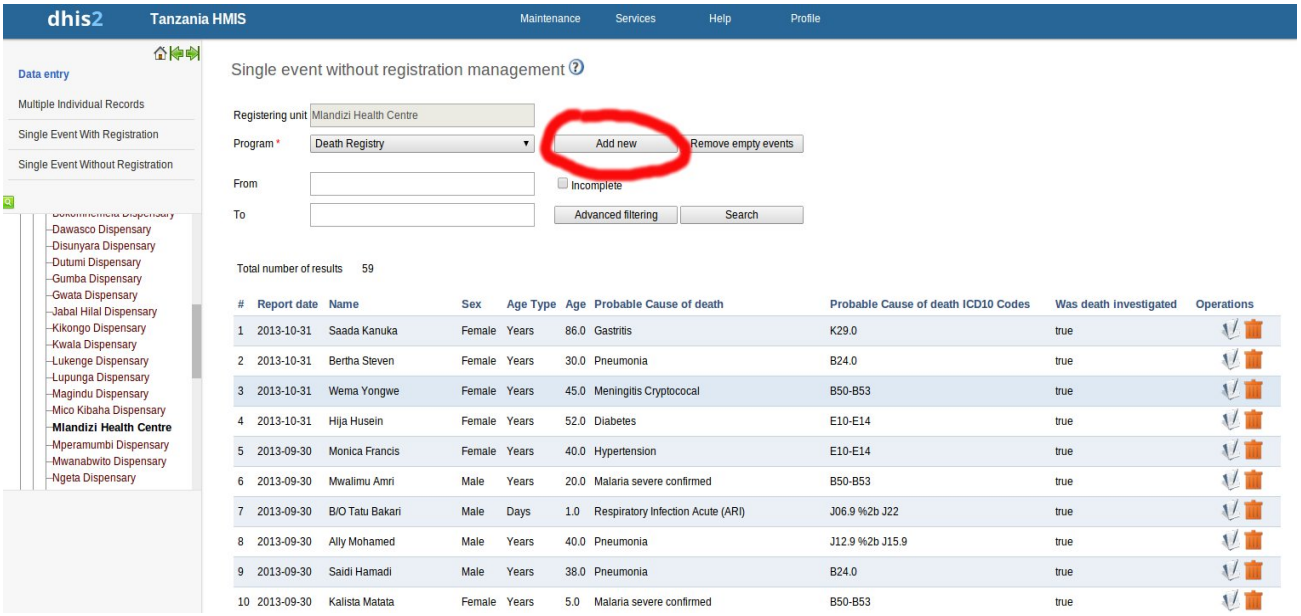


Figure 2.7: List of death for a facility

4. To add a new death for the facility click the **Add New** button as shown above
5. Select the date the death occurred and the form will be displayed.
6. Click the **Complete and add new** button once you have filled in all information in the form and you want to add new event or click **Complete** button if you have filled in all the information and you don't have another death to register.

NB:

In selecting the calendar, you should start with the year followed by month and finishing with the date.

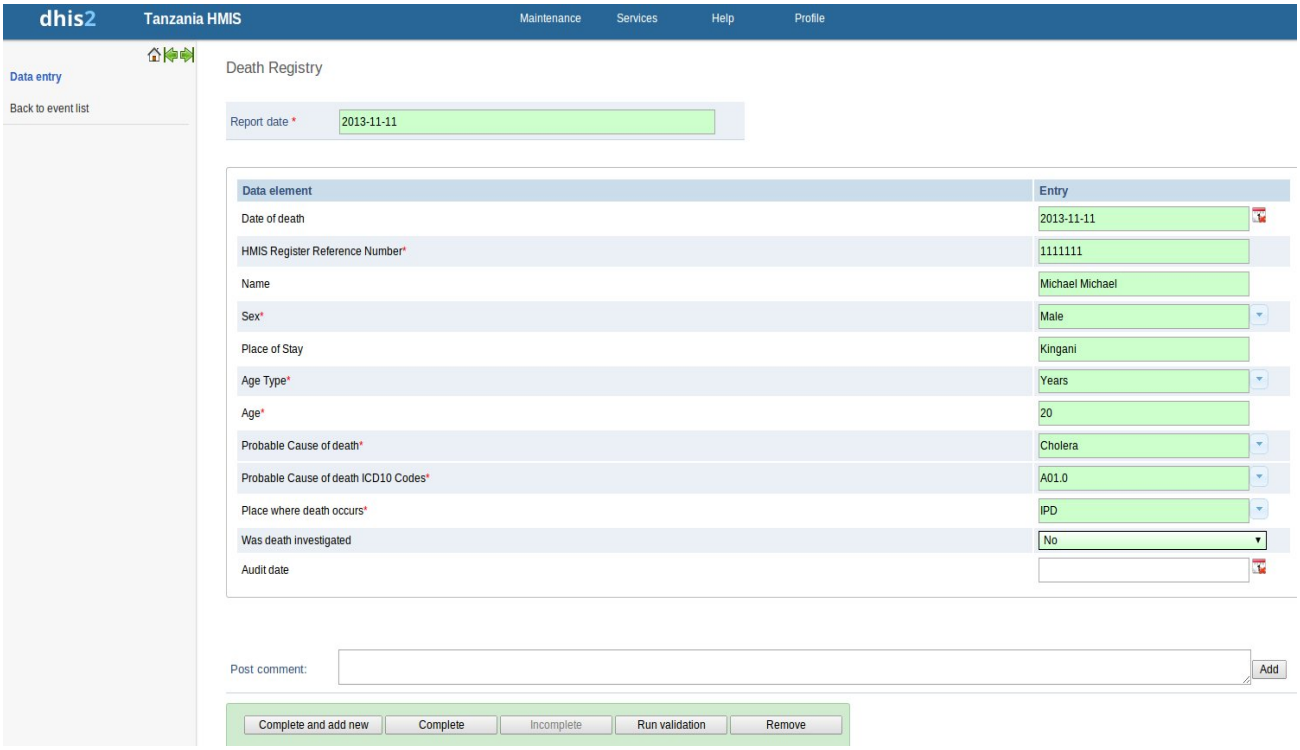


Figure 2.8: The death registry data entry form

Chapter 3: Data Quality

3.1 Overview of Data Quality Checks

Data to be useful which leading to decision making and planning, its quality become the first major concern. To ensure data quality, it has to adhere to quality attributes which are:

1. ***Correctness:*** Data should be within the normal range for data collected at that facility. There should be no gross discrepancies when compared with data from related data elements.
2. ***Completeness****:* Data for all data elements for all datasets from all health facilities should be submitted.
3. ***Consistency:*** Data should be consistent with data entered during earlier months and years while allowing for changes with reorganization, increased work load, etc. and consistent with other similar facilities.
4. ***Timeliness:*** All data from all reporting facilities should be submitted to the districts and entered into DHIS2 at the appointed time as per the MoHSW guideline.

Quality Assurance is a step by step process, from the health facility registration, to the health manager in the District to as far as the data manager in the Ministry level. Everyone has to take their part. Obviously, data quality starts with the paper form. It starts by looking at the form identifying gaps, identifying outliers and other things, then data entry to the DHIS which has mechanisms for assessing quality.

3.2 During Data Entry

- Data can be checked when it has entered into the field to see if it is within the range of maximum and minimum based on the previously entered data.
- To check, double-click the same field you were to enter/have entered data. The results will be as shown in the screen below.

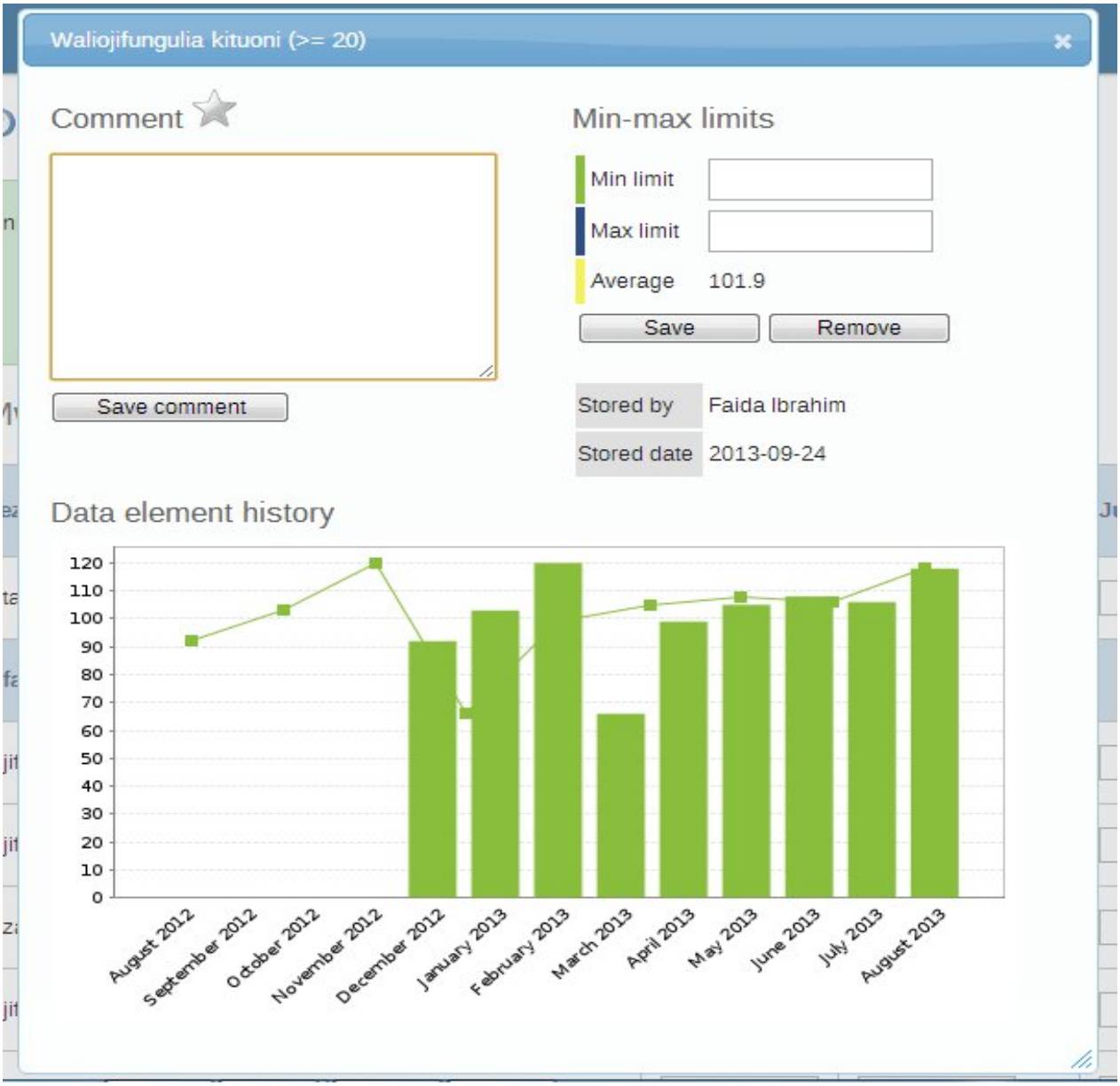


Figure 3.1: Maximum and Minimum limit values based on data entered in the past 12 months

This small screen is specific for the data element you have just double-clicked. The name of the data element is shown in its title bar, the blue strip. The screen has two parts;

- The lower part shows the history of your data, what the values were for the last 12 months. This helps figuring out whether the one you want to enter is reasonable or not.
- The upper part gives you the average of the already entered values, 21.0 for this case, and also gives you the possibility to restrict entry by assigning the minimum and maximum value.

3.3 Validation Rules

These are rules often set by the administrators to help you establish whether the data is valid or not. Validation rules are a comparison based validations where two or more data elements are compared. They are just set to alert you of the possible problems with your data. Consider the elements "**ANC Clients Tested for HIV**" and "**ANC Clients Tested HIV+".** Obviously, it is expected that either:

- **many clients had tested** and **few clients had turned out Positive OR**
- Number of tested **to be the same as** number of positively tested **when all who were tested turned out positive**.

In the system, this might be set as a validation rule in the following way

Left Side	Operator	Right Side
ANC Clients Tested for HIV	**>=**	**ANC Clients Tested HIV+".**

When you run this validation rule, therefore, you want to identify where has this comparison been violated.

3.3.1 Running Validation Rules

You can access Validation Rule Analysis from:

1. The **Services->Data Quality** menu.
2. Then, click the **Validation Rule Analysis** option. The following screen will be displayed.

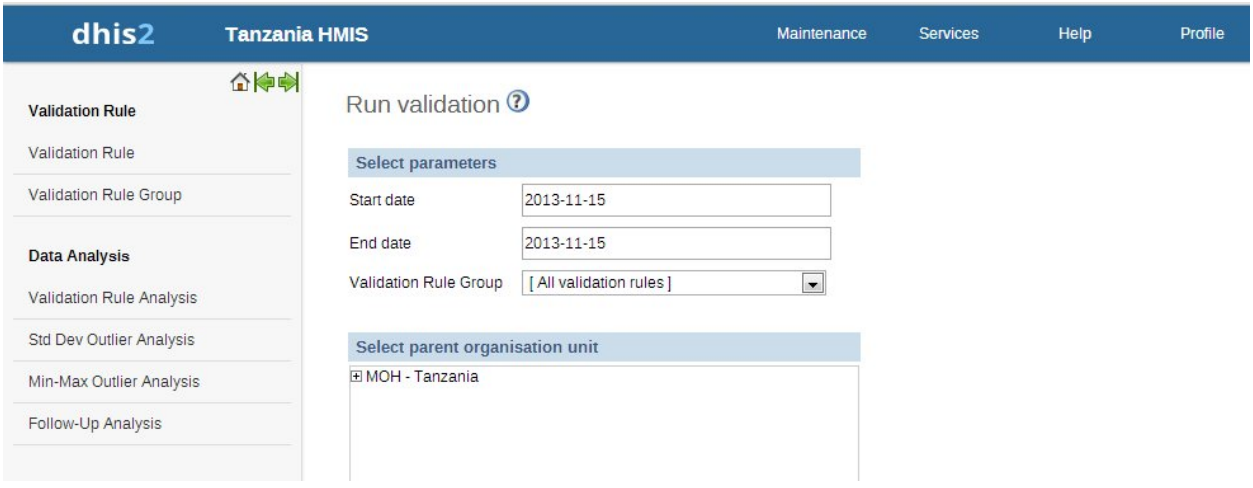


Figure 3.2: Accessing Data Validation Rule Analysis

3. To select data to validate, first enter a **start date** and an **end date** for which data should be included in the analysis. The date picker widget may be used to select dates.
4. Second, choose **validation rule group** either include all validation rules or single group validation rules.
5. Third, select the organisation unit.
6. Finally, click **validate button.** The following screen will appear.

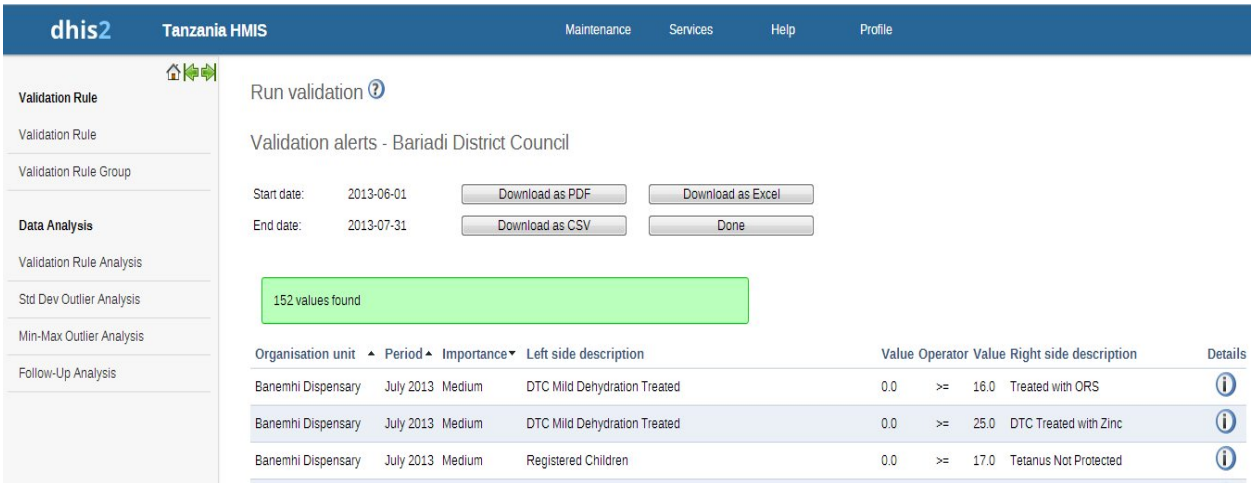


Figure 3.3: Validation Rule Analysis Report

If there are no any violations of validation rules, you will receive the message "***validation passed successfully***". Otherwise, you will receive the list of violated validations rules as shown in the figure below. This list can downloaded as Excel, PDF etc

3.3.2 Validation Rules in Data Entry

Validation rules can also be run in the course of entering data, before one commits "***complete***". This will run the entire validation rule for the available selections (the organisation unit, data set and period.

At the end of each data entry form, there is a button for running validation rules. After data entry process, the user can click on it.

Figure 3.4: Running Validation Rule on data entry form

Chapter 4: Indicators

Indicators are collection of multiple data elements and consist of numerator and denominator. In DHIS2, indicators are calculated from raw data registered into the systems based into indicator formulas. Indicators are used to calculate coverage rates, incidence, ratios and other calculated values which are useful for data analysis

4.1. How to access

You can access Indicator into DHIS2 from the **Maintenance->Data Element and Indicators->Indicator** menu.

- Click on **Maintenance**
- Then D**ata Elements and Indicators**. The following screen will appear

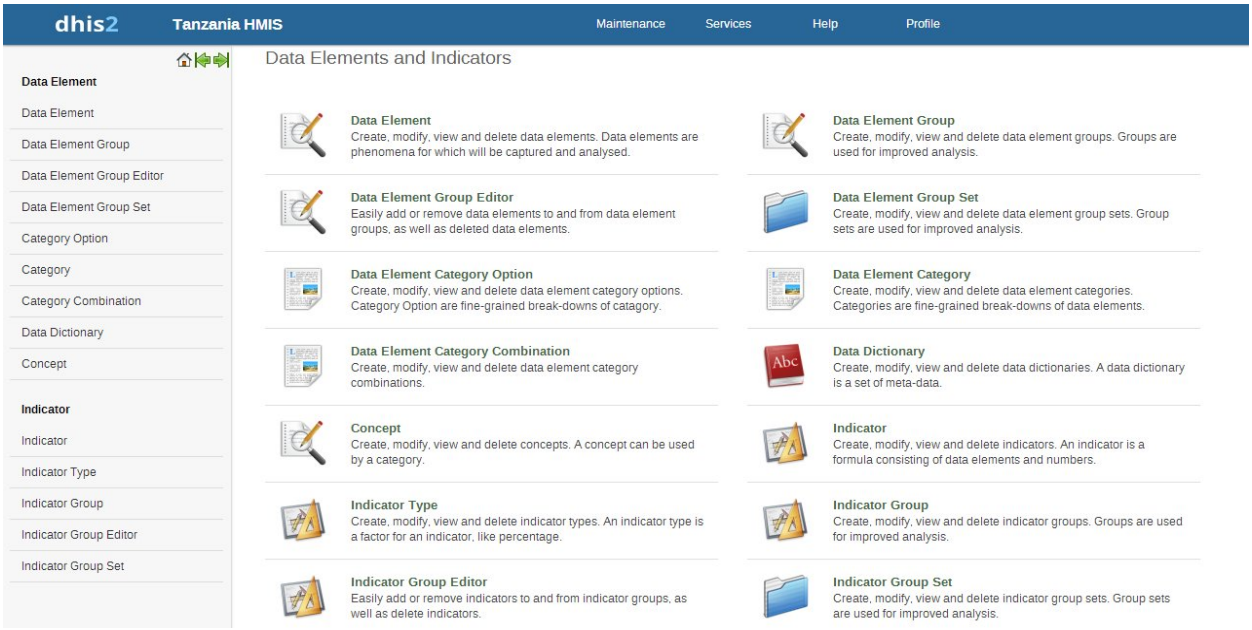


Figure 4.1: Opening Data elements and Indicators Window

- On the left side menu, you can access various Indicator sections: *Indicator, Indicator Type, Indicator Group, Indicator Group Editor and Indicator Group Set*
- You can *add, delete, modify and view* extra information about indicators in the system using icons next to each indicator in the list if you have system administration privilege

NB:

Normal users will rarely use this path. Indicators are defined by system administrators and users will be able to use them while generating various reports in the systems. Therefore, only system administrators have access to this module.

Chapter 5: Reports

5.1. Reporting Functionality in DHIS 2

There are several ways to view and use the data through reports. Reports in this case mean different presentations – charts, graphs, tables and others. All these reports can be obtained when you go to **Services->Reports**. There are two types of reports;

- Automatic reports generated by the system like monthly summary, data coverage, ect
- Pre-defined reports – these are reports defined as the users information requirements

On Selection Reports, Number of pre-configured reports will be displayed, both in the middle panel and the left panel.

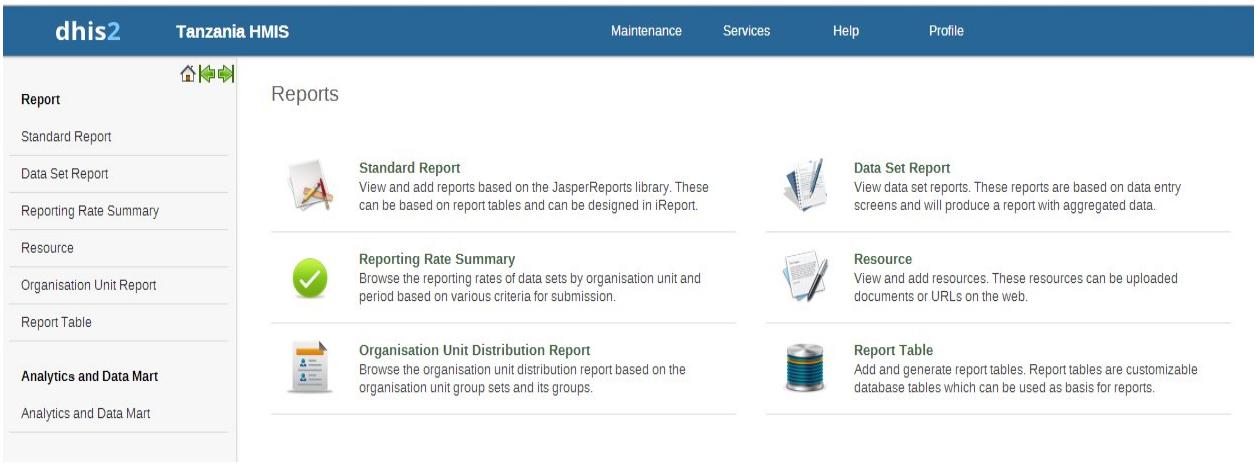


Figure 5.1: Different reports options available in DHIS2

The following sections detail some of the reporting functionalities in the DHIS.

5.2. Dashboard Report

The dashboard is the first sight you get when you log in to the DHIS 2.

- It is the same logic as the car dashboard, where the driver sees the important indicators as he drives.
- Every user has his/her own dashboard, and a dashboard can have more than one charts. Therefore, each user can decide what has to be displayed on the dashboard

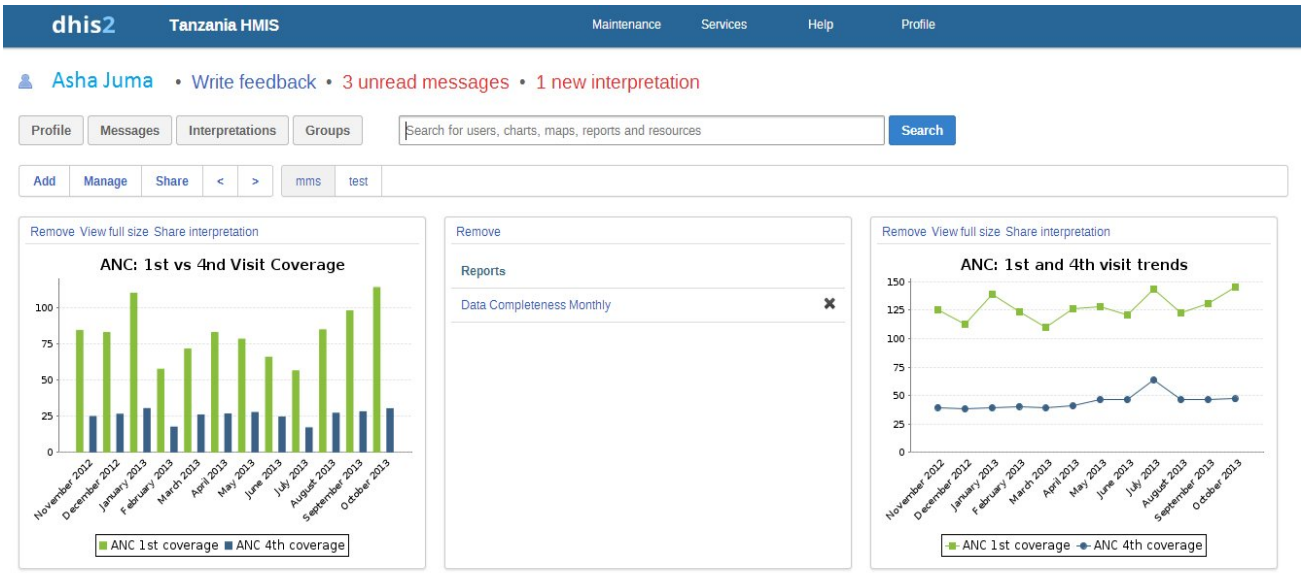


Figure 5.2: DHIS2 Dashboard with Customized user report for quick display

The dashboard is often customised by the user themselves and each time a user logs in to the system they will find the dashboard elements. User cab can Remove, View Full size and Share interpretation of the charts, maps, reports and resources.

5.3. Standard Report

These are reports which are pre-define in the system as per users requirements. As long as the report needs information from data elements that exist in the DHIS2, users can define any report of their choice. To access the reports:

- Go to **Services** drop-down menu
- Select Reports. The report menu found in the left bar, has the options, just
- Click **Standard Report** on the left bar and a list of all pre-defined reports will appear in the main window.

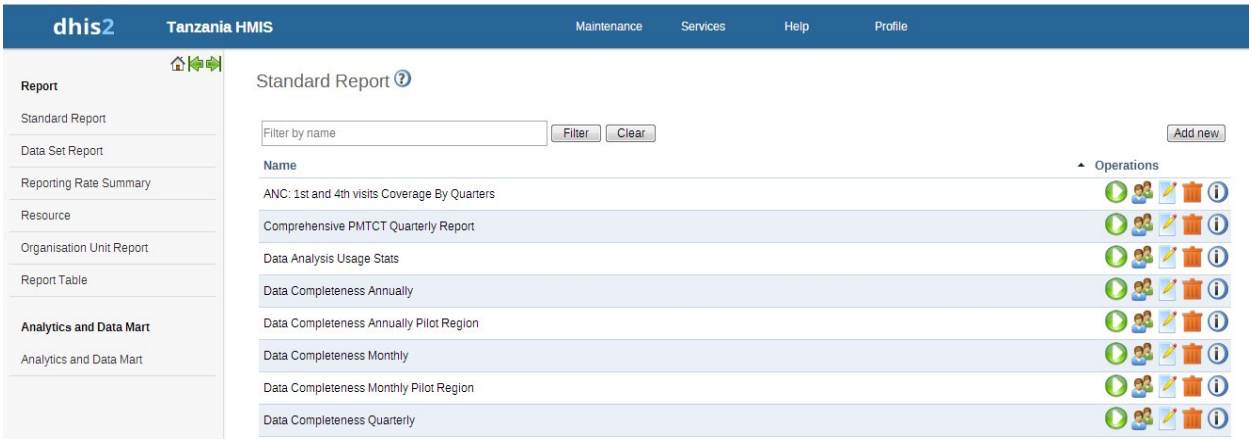


Figure 5.3: A list of pre-defined reports under standard reports

- You run/view a report by clicking on the **white and green arrow** next to the report you want as seen below

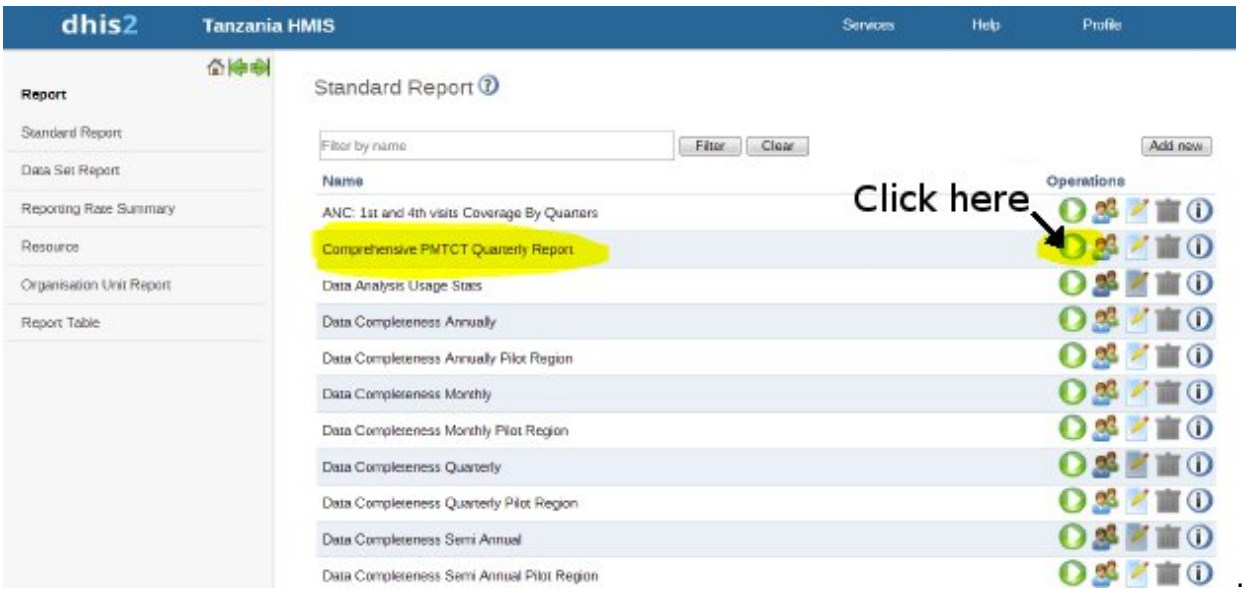


Figure 5.4: Generating standard reports

- You will then see a report parameter window where you must select the values needed for **organisation unit** and/or **reporting period**, depending on what has been defined in the underlying report table(s).
- Click on "**Get Report**" after selecting all the necessary parameters.
- The report will either appear directly in your browser or be available in different formats (PDF, Excel and CSV) for download as seen in the figure below

Figure 5.5: A Standard Reports Generated

- You can either print the report or download the file and keep it locally on your computer for later use.

Note: For any requirement of reports which are not in the list, please communicate with the technical team at Ministry of Health so they define it for your use.

5.4. Dataset Report

A district coordinator would, for each month, sum up values from individual facilities and fill it in the monthly form, as a district form. The monthly summary report is what is referred to as Dataset Report in DHIS. In DHIS, this process is automatic. Provided all the facilities have entered their data, then a dataset report would give the aggregate report form. It can also be generated for just one facility. Dataset Report is a printer friendly view of the data entry screen filled with either raw or aggregated data.

You can access the available reports from the Services drop-down menu, by selecting Reports.

- The report menu found in the left bar, has the options, click **Data Set Report**.

- A criteria window below will appear and you be will required to select **Data set**, **Report period** and **use data for selected unit only** which is option when you want a report for **organization unit** that has children and data collected directly in that unit and **Reporting Organization unit**.

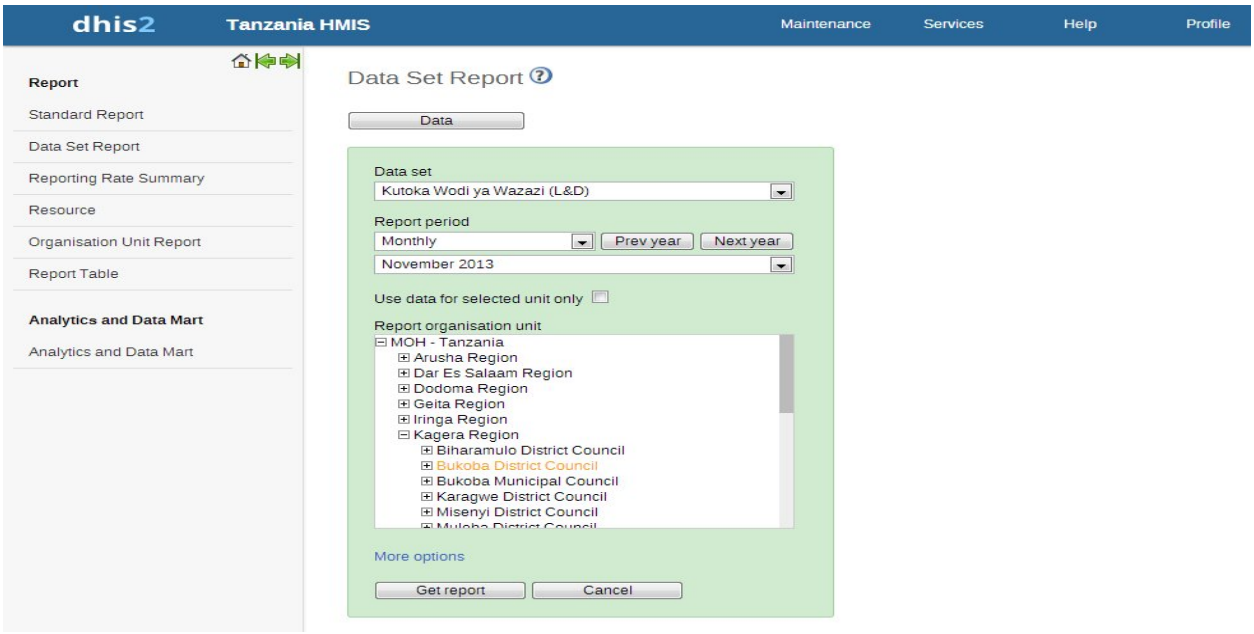


Figure 5.6: Generating Dataset report in DHIS

- After selecting the criteria for the report, click "**Get Report**" button.
- The report will appear on your screen.
- You can choose to download the report as PDF, Excel file or Print for future use as shown in the figure below.

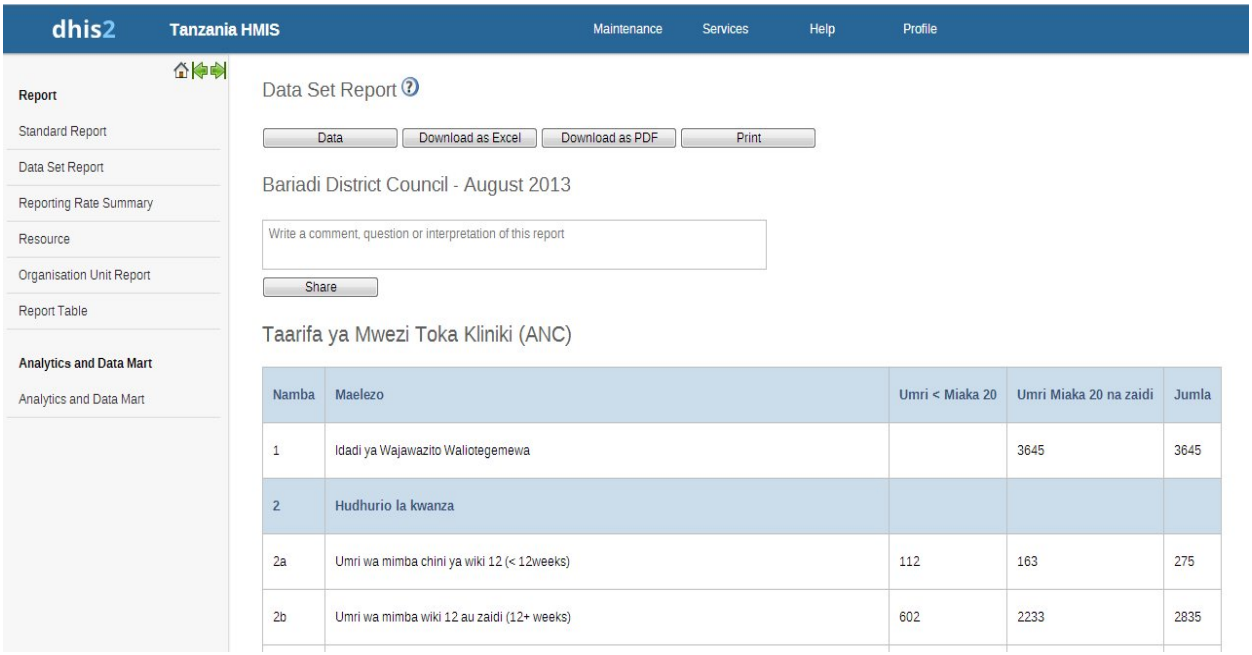


Figure 5.7: ANC Dataset Report for Bariadi DC August 2013

5.5. Reporting Rate Summary

Reporting rate summary helps in establishing:

- Who has reported and who has not
- Who has reported on time and who has not, at any reporting level.
- There are three ways one can establish this;
    - based on the completed form, or
    - compulsory data elements and
    - Registered data sets.

Experience, however, shows that most reports are generated based on completed form (default).

- You can access the available reports from the Services drop-down menu, by selecting Reports.
- The report menu found in the left bar, has the options, click **Reporting rate summary**.

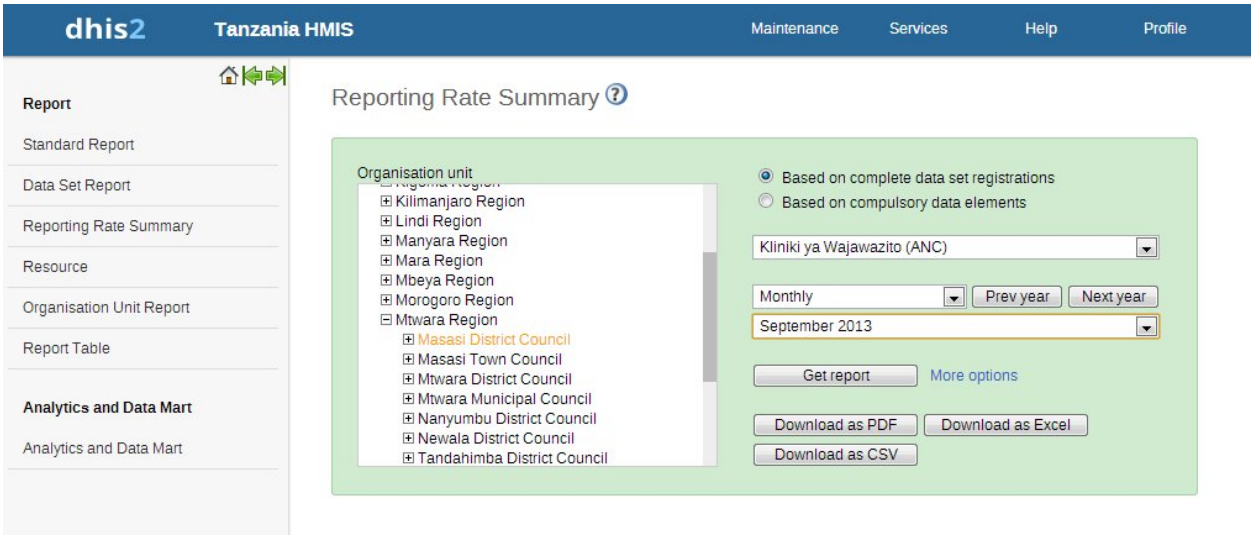
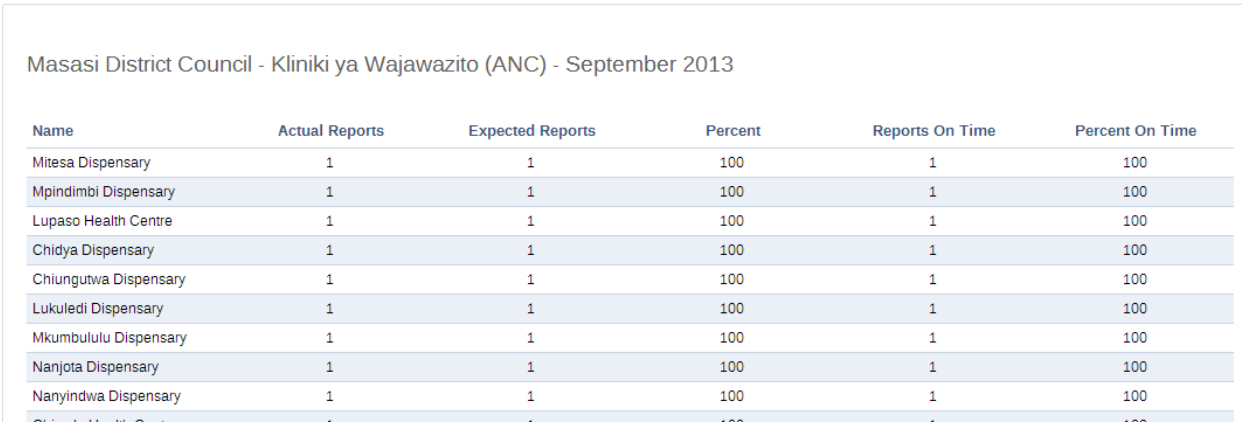


Figure 5.8: Generating Report Rate Summary

- After selecting the criteria for the report, click "**Get Report**" button, the report will appear on your screen.
- You can choose to download the report as PDF, Excel file for future use as shown in the figure below.



Masasi District Council - Kliniki ya Wajawazito (ANC) - September 2013

Name	Actual Reports	Expected Reports	Percent	Reports On Time	Percent On Time
Mitesa Dispensary	1	1	100	1	100
Mpindimbi Dispensary	1	1	100	1	100
Lupaso Health Centre	1	1	100	1	100
Chidya Dispensary	1	1	100	1	100
Chiungutwa Dispensary	1	1	100	1	100
Lukuledi Dispensary	1	1	100	1	100
Mkumbululu Dispensary	1	1	100	1	100
Nanjota Dispensary	1	1	100	1	100
Nanyindwa Dispensary	1	1	100	1	100

Figure 5.9: ANC Report Rate Summary Masasi DC September 2013

5.6. Organisation Unit Report

These are reports meant for establishing the distribution of the Organisation Units in the health sector. There are four reporting options;

- Organization Units reports based on the **ownership** – who owns it, the private facilities, Local government authority, MoHSW.
- Organization Units reports based on **type –** what kind of an institution it is, a hospital, a health centre, a dispensary and others. It is even more useful as it gives in aggregate forms.

- Organization Units reports based on **ownership with general groups –** what groups it belongs, the Defence, Faith Based Facilities, Parastatal, Private, Public facilities, and
- Based on **P4P –** District, Region and Upgraded Health Centre

You can access the Organisation Unit Report from the left side menu in the **Services->Reports** module.

- To run a report, first select an **organization unit** in the upper left side organization unit tree.
- The report will be based on organisation units located under the selected organisation units.
- Then select the organisation units group set that you want to use, typically these are Type, Ownership, P4P, ownership with general groups but can be any user-defined organisation units group set..

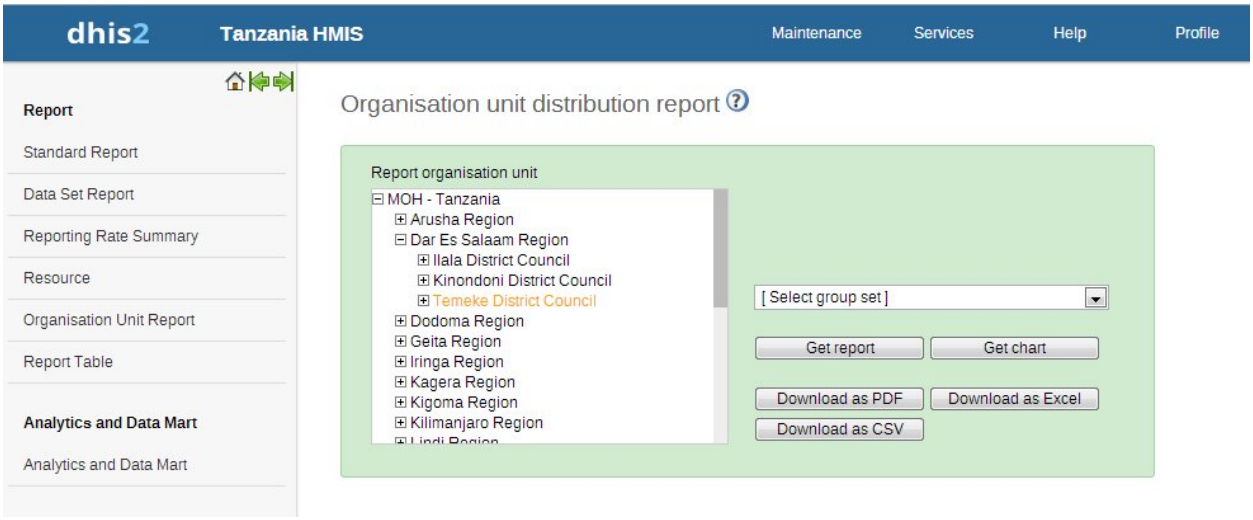


Figure 5.10: Generating Organization Unit Distribution report

- Then you can click on either Get Report to get the table-based presentation or Get chart to get the same result in a chart

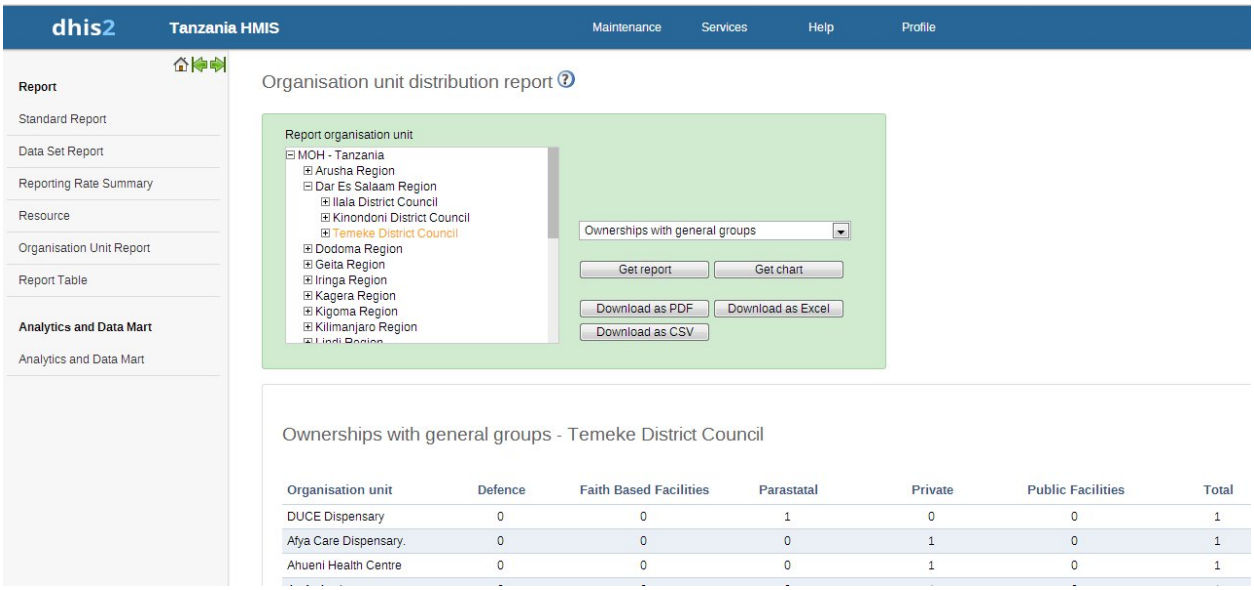


Figure 5.11: A Report for Organization unit distribution.

5.7. Report Tables

Report tables are one of the more basic report options, but are fast and simple to use. To run a report table:

- First navigate to the list of available report tables in **Services->Reports ->Report Tables** and then
- Click on the Green and white arrow (the first symbol in the operations list) next to the report table you want to view.

Report parameters:

- Most report tables have parameters, which mean that you can filter which organisation units and/or periods you want in the report. This makes the reports much more reusable.
- When you run the report table a Report parameter window will open and ask the user to input values for the selected parameters.
- The possible parameters are Reporting Period and organisation units, and either one of these or both will show in the window.
- After selecting the values click on the **Get Report** button.

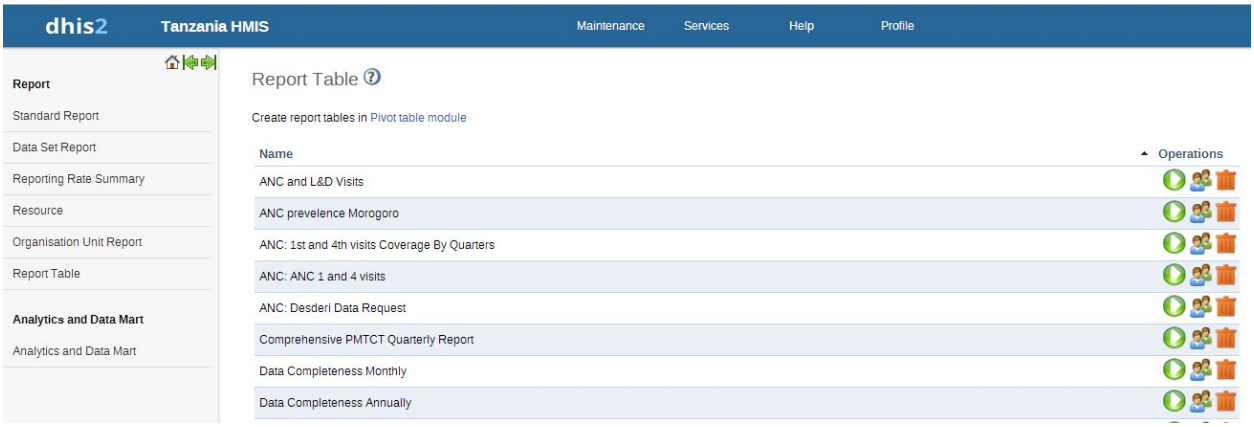


Figure 5.12: List of predefined Report Table reports

Export/view options:

- When the report table is ready it will be displayed in a html view.
- The report table can be exported to pdf (for better printing and easier saving), excel, csv, and also to a standard report format (Jasper) with a nicer table and a chart shown in pdf, or as a jasper design file for further improvements and changes to the report design before uploading it as a standard report (see the Creating standard reports section).

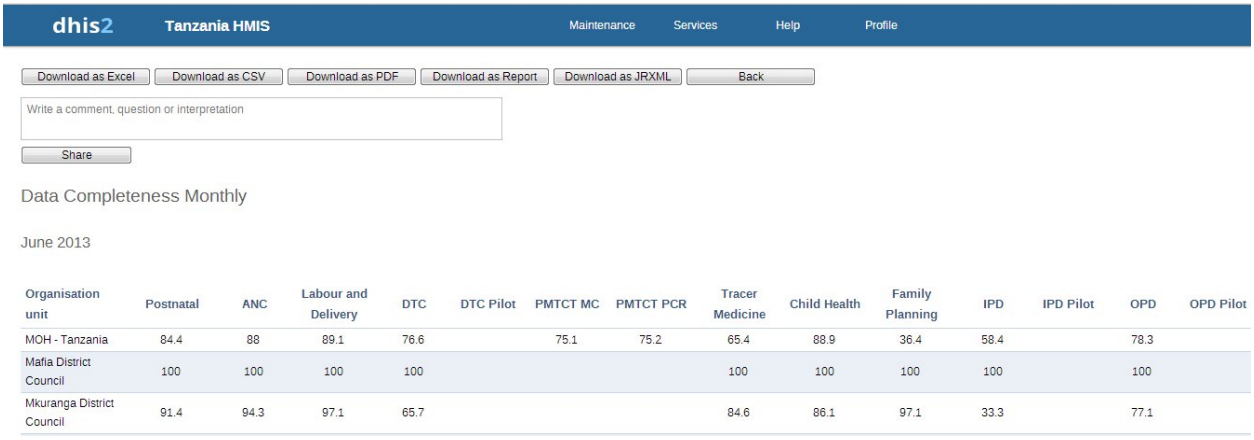


Figure 5.13: Generating Report Table for Monthly Completeness rate

Chapter 6: Data Visualizer

6.1. Data Visualizer overview

The data visualizer module enables users to easily create dynamic data analysis and visualizations through charts and data tables. You can access this module by going to "**Services->Data Visualizer**" in the main menu. The image below shows the viewport of the module. For a quick start:

i. Look under the "Indicator" heading and select an indicator group from the list of groups.

ii. Look under "Available indicators" and select a few indicators from the list by double-clicking on them.

iii. Click "Update" in the top bar and see the chart unfold.

The data visualizer is designed firstly to be easy-to-use - you can simply select the indicators, data elements, periods and organisation units you want to include and click "**Update**" to get your visualization. Secondly it is designed to be fast and work well over poor Internet connections - charts are generated in the web browser and very little data is transferred over the Internet.

Figure 6.1: Graph in Data Visualizer Report

6.2. Selecting chart type

The Visualizer module provides seven different chart types, each with different characteristics. You can select the type of your chart by clicking on one of the icons in top left bar titled "**Chart type**".

i. Column chart: Chart which displays information as vertical rectangular columns with lengths proportional to the values they represent. Useful eg. for comparing performance of different districts.

ii. Stacked column chart: Chart with vertical rectangular columns where bars representing multiple categories are stacked on top of each other. Useful eg. for displaying trends or sums of related data elements.

iii. Bar chart: Same as column chart, only with horizontal bars.

iv. Stacked bar chart: Same as stacked column chart, only with horizontal bars.

v. Line chart: Graph which displays information as a series of points connected by straight lines. Also referred to as time series. Useful eg. to visualize trends in indicator data over multiple time periods.

vi. Area chart: Chart which is based on line chart, with the space between the axis and the line filled with colors and the lines stacked on top of each other. Useful for comparing the trends of related indicators.

vii. Pie chart: Circular chart divided into sectors (or slices). Useful eg. to visualize the proportion of data for individual data elements compared to the total sum of all data elements in the chart.

viii. Radar chart: Displaying multivariate data on axes starting from the same point. Also known as spider chart

6.3. Selecting series, category and filter

This section lets you define which dimension of the data you want to appear as series, category and filter. This asks for a closer explanation. Dimension in this regard refers to the elements which describe the data values in the system. There are three main dimensions in the system:

i. Data: Includes data elements and indicators, describing the phenomena or event of the data.

ii. Periods: Describes when the event took place.

iii. Organisation units: Describes where the event took place.

The visualization module lets you use these dimensions completely flexible in terms of appearing as series, categories and filter. Understanding these concepts is most easily done by looking at the screenshot from the opening page below:

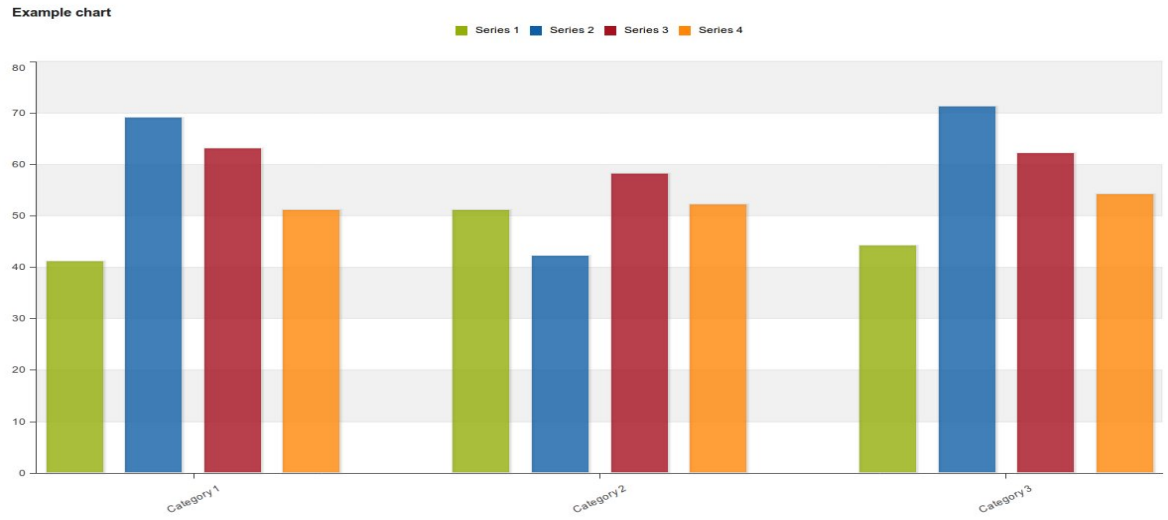


Figure 6.2: Category and Series example

More formally this can be described as following:

i. Series: A series is a set of continuous, related elements (eg. periods or data elements) which you want to visualize in order to emphasize trends or relations in its data.

ii. Categories: A category is a set of elements (eg. indicators or organisation units) for which you want to compare its data.

iii. Filter: Since most charts are two-dimensional, a filter must be used on the third dimension in order to use only a single element for the chart to become meaningful.

6.4. Selecting indicators and data elements

The Visualizer module can display any number of indicators and data elements in a chart and data table. Both indicators and data elements can be selected and appear together in the same chart. You can select indicators by clicking at the "**Indicators**" header and selecting an indicator group from the list of groups below it. This will make the indicators in the selected group appear in the list under "**Available indicators**" to the left. From that list

you can double click on any indicator in order to select it, this will move it to the list under "**Selected indicators**". Alternatively you can mark one or more indicators and click the single-arrow button. To select all indicators you simply click on the double-arrow button. To deselect indicators you can do correspondingly in the "**Selected indicators**" list. To select data elements click on the "**Data elements**" header. The same principle for selecting and deselecting applies as for indicators.

6.5. Selecting reporting rates

The Visualizer can display reporting rates in a chart, by itself or together with indicators and data elements. You can select reporting rates by clicking at the "Reporting rates" header. Reporting rates are defined by data sets. It can be selected by double-clicking in the list of available data sets to the left.

6.6. Selecting periods

To select periods click on the "Periods" header. You can select any number of periods from the set of periods listed under the header, such as "**Last month**", "**Months this year**" and "**Last 5 years**". The names should be fairly self descriptive. All periods are relative to the current date, meaning that if the current month is March and you select "**Last month**", the month of February will be included in the chart.

6.7. Selecting organisation units

You can select which organisation units to include in the chart by clicking the "**Organisation units**" header. This section features three ways of selecting organisation units. The default mode is called "**Organisation units**" and lets you select the organisation units you want to appear in the chart from the tree. This mode also features three checkboxes. Checking "**User org unit**" will disable the organisation unit tree and give you the organisation unit that is related to the current/logged in user instead. This is also useful for administrators as they can create a meaningful "system" favorite with this option checked and all users will find their respective organisation unit when they open it. The same concept goes for "**Org unit children**" and "**Org unit grand children**". The second mode is called "**Select levels**". Here you can select all organisation units at one or more levels. However, at the same time you also have the option to select parent organisation units in the tree, which makes it easy to select e.g. all facilities inside one or more districts.

The same thing goes for the third mode called "**Select groups**". Here you can select all organisation units inside one or more groups and parent organisation units at the same time.

6.8. Selecting chart options

You can set various chart options by clicking on the "**Options**" button the chart toolbar. The available Show trend line, Show series data, Target line value/title, Base line value/title, Show values, Hide chart legend, Hide chart title, Chart title, Domain axis label and Range axis label

6.9. Displaying a chart

You can display a chart based on your selections simply by clicking the "**Update**" button on the top centre menu. This requires that you have selected one or more elements from all of the three dimensions - data (indicators, data elements, reporting rates), periods (relative, fixed) and organisation units (units or groups). Note that "Months this year" from the period dimension and the root organisation unit are selected by default.

Notice that you can hide and show individual data series in the chart by clicking directly on the series label in the chart- they appear either at the top or to the right of the chart.

If you want to give the chart more space on your screen you can click on the triple left-arrow button on the top centre menu. This will collapse the left side menu. You can get this menu back by clicking on the same button again.

6.10. Downloading chart as image or PDF

After you have rendered a chart you can download it to your local computer as and image or pdf by clicking on "Download" on the top centre menu. The file will be automatically downloaded to your computer - for instance can you now embed the image file into a text document as part of a report. You can also download the data source behind the chart in json, xml, csv or Microsoft Excel format.

6.11. Saving chart as favourite

Once you have rendered a chart you can save it as a favorite to be able to access it easily at a later point. Click on the "**Favourites**" button on the top menu to open up the favourites window. Click "**Add new**" and in the name field enter the desired name for your chart. The chart will be visible only to yourself. For every favourite in the list you have four options to

the right. You can rename the chart (grey button), overwrite the chart (green button), modify the sharing settings of the chart (blue button) or delete the chart (red button). These favourite charts can later be included on your personal dashboard. After saving you can navigate to the dashboard module, click on the "Insert" link over the chart areas and select your preferred chart.

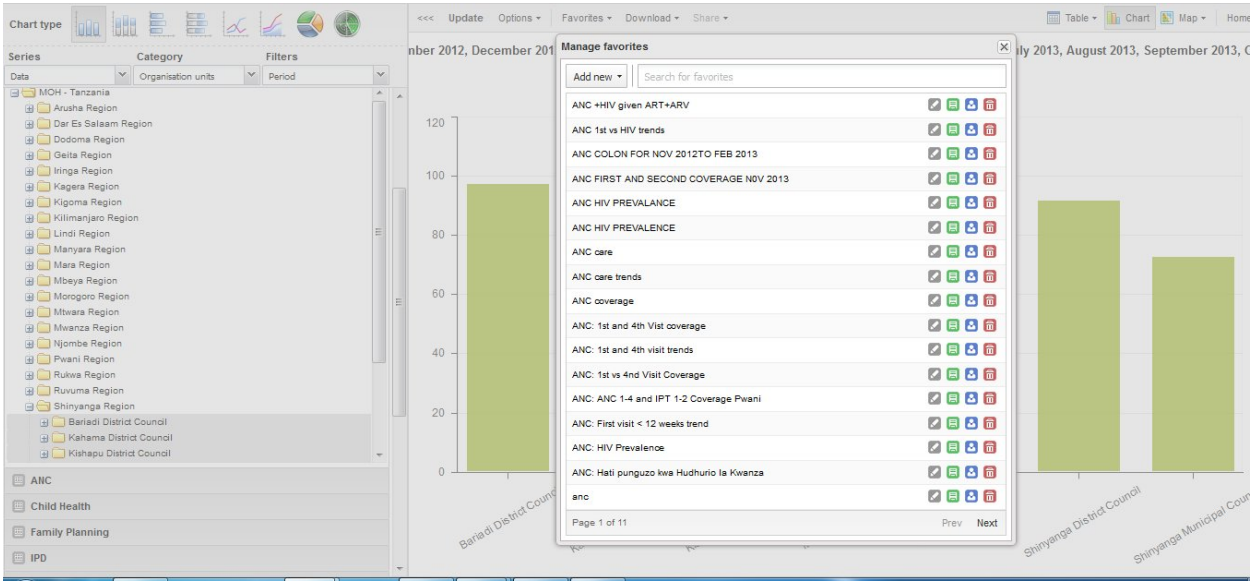


Figure 6.3: Saving graph as favorites

6.12. Exiting the data visualizer module

If you want to exit the module and go back to the DHIS start page you can click on the "**Home**" button to the right side of the top centre menu.

Chapter 7: GIS

7.1. GIS module overview

You can access the GIS module from the **Services->GIS** link in the top menu. The picture below shows the GIS viewport.

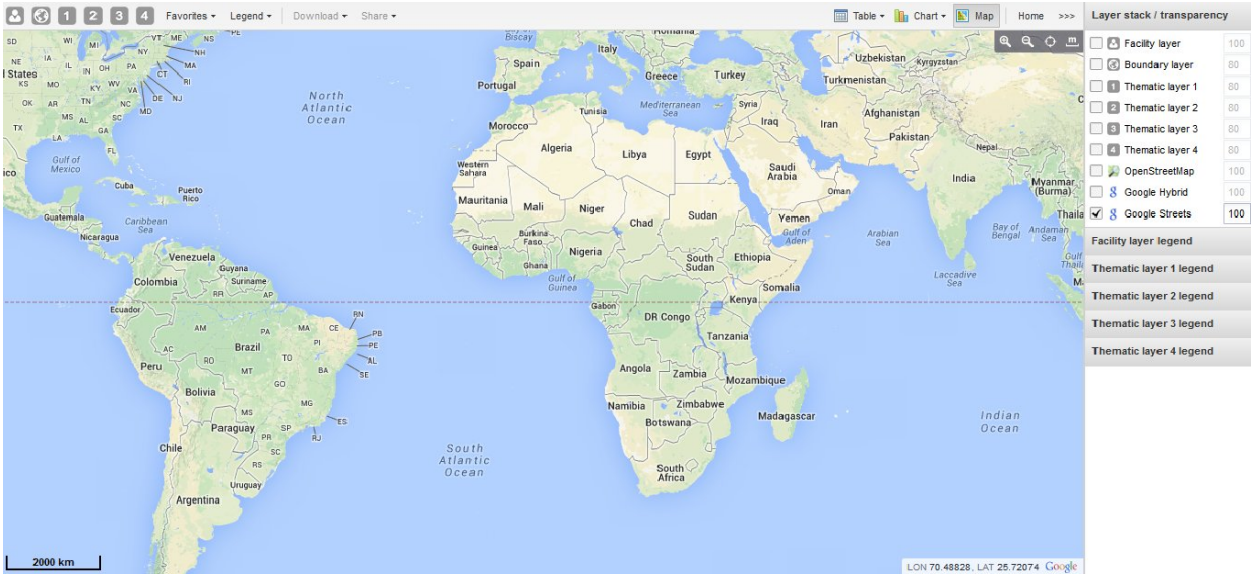


Figure 7.1: GIS Module interface

In the top right corner there is a panel called "**Layer overview**". If you are online you will see Google Streets and Google Hybrid which can be used as background maps/layers. Switch between the two of them by checking the checkbox. By unchecking the box you can hide the background completely. If you want to see the background, but with reduced opacity, you can set the visibility to something lower than 100% in the numberbox to the right. The final four layers are the vector layers which the user has at his disposal for thematic mapping (explained in the next section). The panels below hold the map legends when you create a thematic map. A legend explains the link between values and colors on your map.

Lets take a look at the map toolbar. The four icons from the left represent the mentioned vector layers and this is the starting point of the GIS application. Further to the right we have "**Favorites**": Save your maps to easily restore them later. Saving a map as a favorite also gives you the opportunity of sharing it with other users as an interpretation or put it on the dashboard. "**Legend**": Create your own legend sets to ensure meaningful maps.

"**Download**": Export the maps as a PNG image. "**Share**": Share your favorites as map interpretations with other users.

In the top right corner of the map viewport you find four buttons: "**Zoom in**", "**Zoom out**", "**Zoom to visible extent**" (automatically adjusts the zoom level and map center position to put the data on your map in focus) and "**measure distances**".

The current longitude/latitude position of the mouse cursor is displayed in the bottom right corner of the map viewport.

7.2. Thematic mapping

This section describes the four vector layers which the user has at his disposal for thematic mapping: "Facility layer", "Boundary layer" and "Thematic layer" 1-4.

7.2.1. Thematic layer 1-4

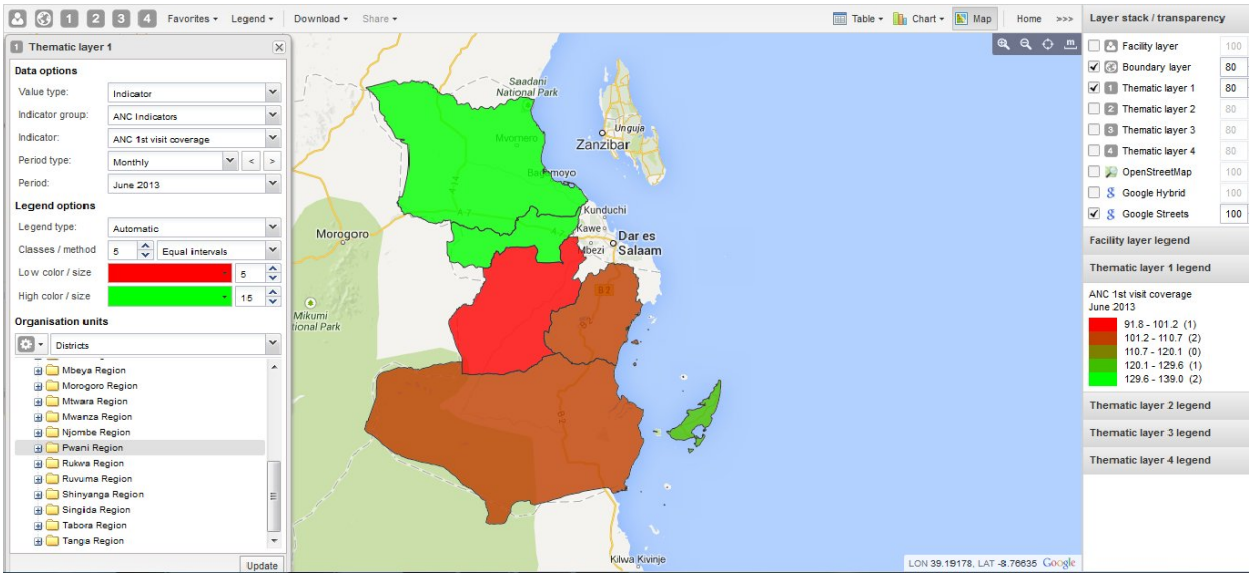


Figure 7.2: Thematic Layers in GIS

The four thematic layer panels let you use your data for thematic mapping. All you need to do is selecting your desired combination of indicator/dataelement, period and map combination. Then the organisation unit level and parent to define the boundaries. If your database has coordinates and aggregated data values for these organisation units they will appear on the map. Note that the DHIS2 data mart must be run in order to have aggregated values available.

You may choose between legend types: automatic and predefined. Automatic means that the application will create a legend set for you based on your what method, number of classes, low color and high color you select. Method alludes to the size of the legend classes. Set to Equal intervals they will be “highest map value – lowest map value / number of classes”. Set to Equal group count the legend creator will try to distribute the organisation units evenly. The legend will appear as an even gradation from the start color to the end color

Low radius and high radius only have effect on points (facilities) and decides the circle radius for points with the lowest and highest value.

Thematic layer 1-4 menu have a "**Filter**" option in addition to the boundary layer menu options. It lets you apply value filters to the organisation units on the map. The filter is removed when you close the filter window.

7.2.2. Facility layer

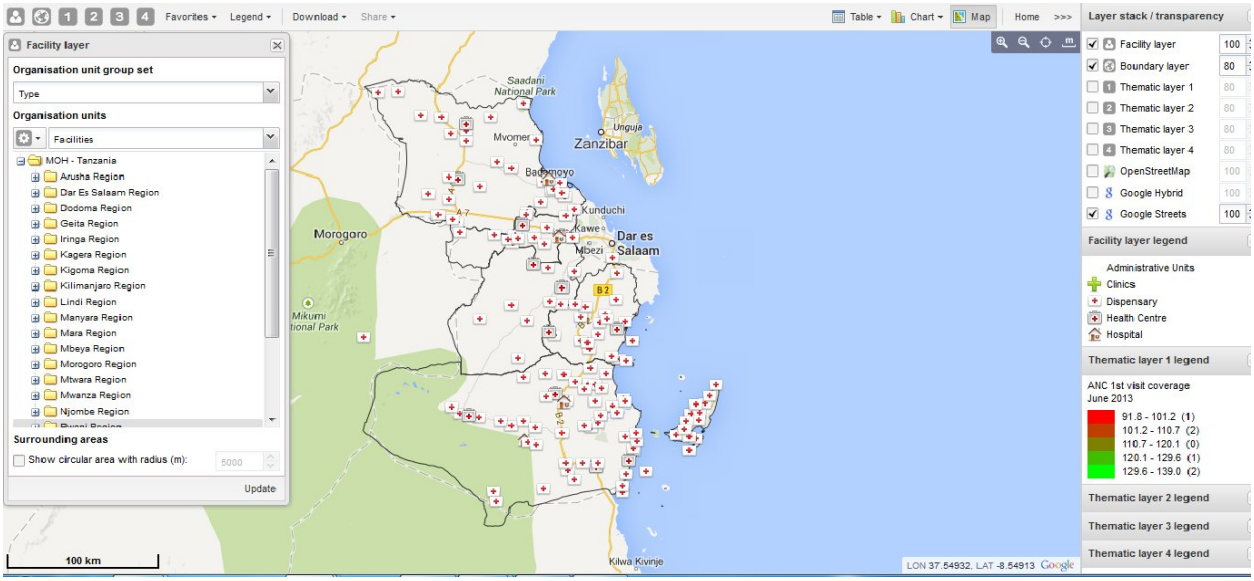


Figure 7.3: Facility Layers parameters

This layer displays icons that represent facilities based on the facility type. Polygons will not show up on the map, so make sure to select an organisation unit level that has facilities. Click an icon on the map to open the context menu with two options. "Show information sheet" provides you with data for several data elements for this organisation unit. The data element group and period type are "system settings" called "Infrastructural data elements" and "Infrastructural period type". The second option in the context menu is "Relocate" and lets you graphically move the organization unit to a different location. The new coordinate will be stored permanently. Browser cache must be deleted to see thechange if you reload the page.

In the "**Edit layer**" window will find "surrounding areas" in addition to group set, level and parent. This lets you draw a circle around each facility with a desired radius in kilometers.

7.2.3. Boundary layer

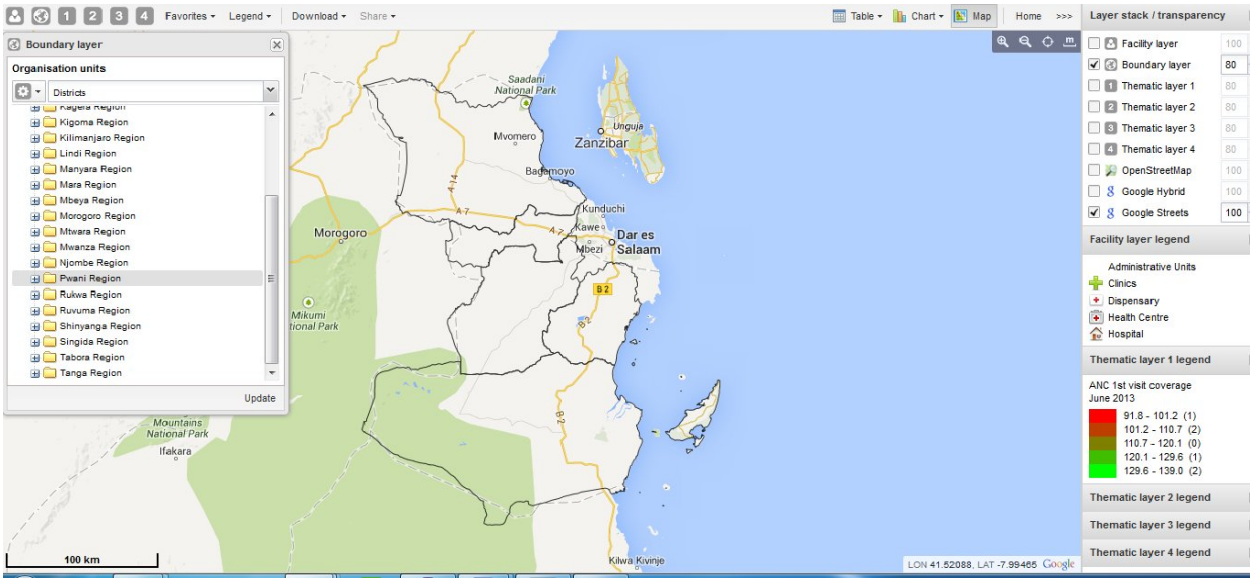


Figure 7.4: Boundary Layer Parameters

The purpose of the boundary layer is to display the boundaries/coordinates in the system. No data will be shown. This layer is useful if you are offline and thus have no background map. Click on **the boundary/globe** icon on the toolbar and select "**Edit layer**". You can select the organisation units you want to show on the map by selecting a level and a parent. That means "show all organisations units at this level that are children of this parent". When there are visible organisation units on the map, you can easily navigate up and down in the hierarchy without using the level/parent user interface. By clicking one of the organisation units a context menu will open, then select "**drill down**" or "**float up**". The drill down option will be disabled if you are already on the lowest level or if there are no coordinates available on the level below. Vice versa goes for floating up.

The layer menu also offers to put on labels and to locate an organisation unit in the map.

The final option in the layer menu is "Close". This completely resets the layer content, the edit layer form and the legend panel

7.3. Tools

This section describes the available GIS tools

7.3.1. Favourite maps

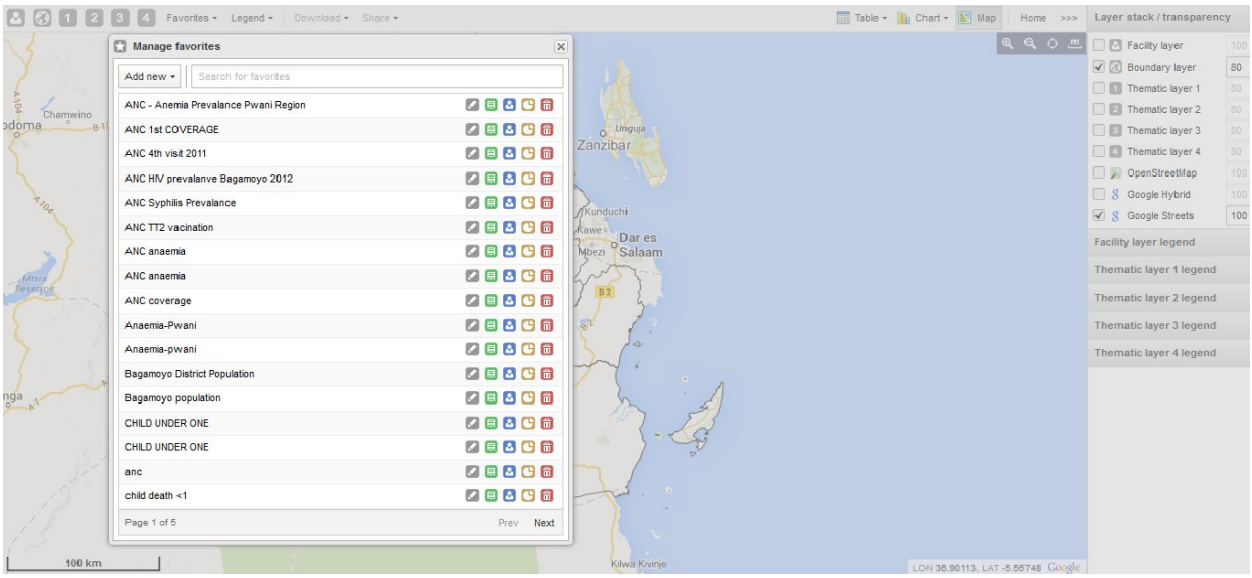


Figure 7.5: Saving Map as favorites

Click the **"Favorites**" button on the toolbar to open the "**Manage favorites**" window. To add a new favorite, click the"**Add new**" button. A new window opens. Enter a name and click the "**Create**" button. You will find your new favorite in the list.

All favorites have four action buttons on the right hand side. Grey: Edit favorite name. Green: Save current map to this favorite (overwrite). Yellow: Add this favorite to dashboard. Red: Delete this favourite.

You can search for favorites in the textfield above the favourites. The list will be filtered on every character that isentered. Click the "**next**" and "prev" buttons in the bottom right corner to navigate between pages.

7.3.2. Create Predefined legend sets

Click the "**Legend**" button on the map toolbar. To create a new set click the "**Add new**" button. Example usage (vaccination coverage): Firstly, give the legend set a name. Then create the legends you want in your legend set. The first one could be "Low bad" (name), 0 (start value), 50 (end value), red (color). Click "Add legend" and appears in the list below. Then create "Medium" / 50 / 80 / yellow, "High good" / 80 / 100 / green and finally "Too high" / 100 /10000 / grey. Now, click the "Create" button in the bottom right corner. If your

legend set has overlapping legends (e.g. 0-50 and 40-80) you will not be allowed to proceed. If your legend set has a gap between the legends (e.g. 0-50 and 60-80) you will get a warning, but are allowed to proceed.

You can assign a legend set to an indicator or a data element in the Indicator/Data element module. This legend set will then be automatically selected when such an indicator/data element is selected in the GIS

7.3.3. Download map as images

Click the "**Download**" button on the map toolbar. Enter a name in the textfield and click "**Download**". The browser will download a PNG image. If the toolbar "**Download**" button is disabled you need to create a map first.

7.3.4. Share map interpretation

Open a **favorite** or save a new map as a favorite. Then click the "**Share**" button on the map toolbar. Type in your interpretation and click "**Share**"

Chapter 8: Pivot Table

8.1. GIS module overview

The pivot table module enables users to create pivot tables, using all available data dimensions in DHIS 2. A pivot table is a dynamic tool for data analysis which lets you quickly summarize and arrange data according to its dimensions. Examples of data dimensions in DHIS 2 are data elements (explaining what the data means), periods (representing the time aspect) and the organisational hierarchy (representing the geographical location of the data). From these dimensions you can freely select dimension items to include in the pivot table.

A pivot table can arrange data dimensions on columns, rows, and as filters. When you place a data dimension on columns, the pivot table will display one column per dimension item. If you place multiple data dimensions on columns, the pivot table will display one column for all combinations of the items in the selected dimensions. When you place a data dimension on rows, the pivot table will display one row per dimension item in a similar fashion. The dimensions you select as filters will not be included in the pivot table, but will aggregate and filter the table data based on the selected filter items.

The workflow for creating a simple pivot table is:

1. Select dimension items in the left menu, for instance a few data elements.
2. Click "Layout" on the top menu and arrange the data dimensions as columns, rows, and filters. You can leave the selection as it is if desired.
3. Click "Update".

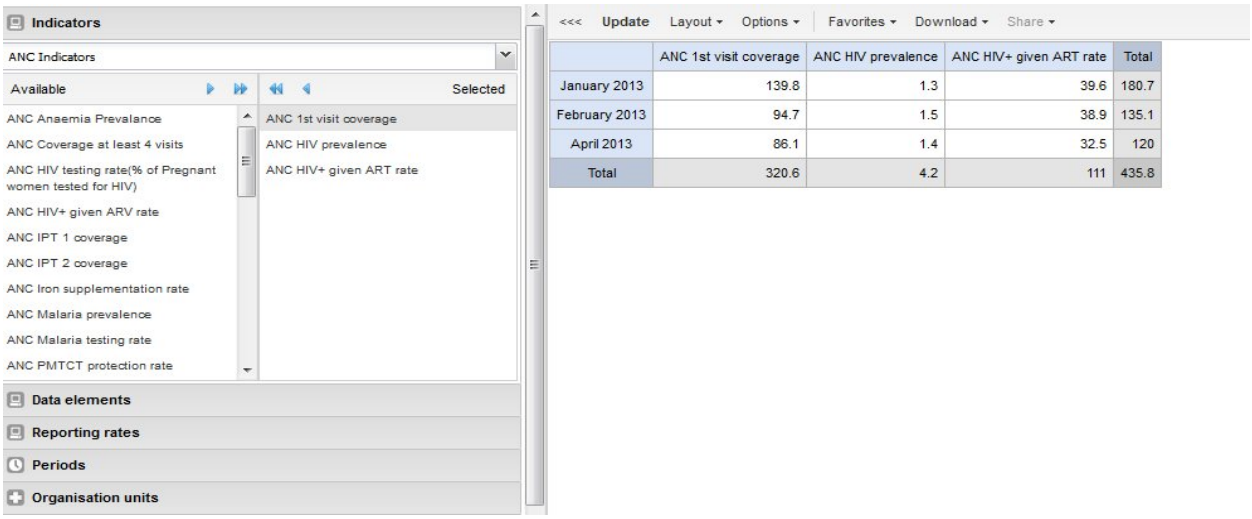


Figure 8.1: Pivot table example

8.2. Selecting dimension items

The left menu will list sections for all available data dimensions. From each section you can select any number of dimension items. As an example, you can open the section for data elements and select any number of data elements from the available list. You can select an item by marking it and clicking on the arrow in the section header or simply double-clicking on the item. Before you can use a data dimension in your pivot table you must at least select one dimension item. If you arrange a dimension as columns or rows but do not select any dimension items, the dimension will be ignored.

For the indicator and data element dimensions: First select one or all groups from the group list. Second select data elements from the available items list.

For the period dimension: You can choose between using fixed periods or relative periods. An example of a fixed period is "January 2012". To select fixed periods start by selecting a period type from the period type list. You can then select periods from the list of available periods. Relative periods are periods relative to the current date. Examples of relative periods are "Last month", "Last 12 months", "Last 5 years". Relative periods can be selected by ticking the checkboxes next to each period. The main advantage of using relative periods is that when you save a pivot table favorite, it will stay updated with the latest data as time goes by without the need for constantly updating it.

For the organisation unit dimension: Select any number of organisation units from the hierarchy. To select all organisation units below a specific parent organisation unit, right click and click "Select all children". To manually select multiple organisation units, click and hold the Ctrl button while clicking on organisation units. You can tick "User organisation unit", "User organisation unit children" or "User organisation unit grand children" in order to dynamically insert the organisation unit or units associated with your user account. This is useful when you save a pivot table favorite and want to share it with other users, as the organisation units linked with the other user's account will be used when viewing the favorite.

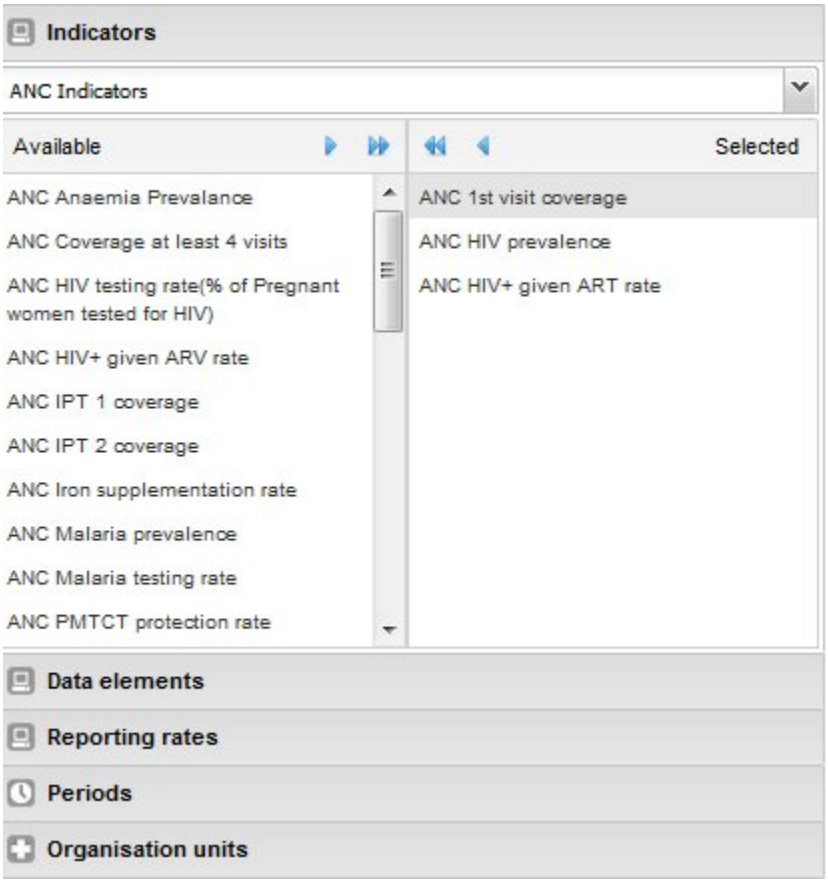


Figure 8.2: parameters to select in pivot tables

8.3. Arranging table layout

After selecting data dimensions it is time to arrange your pivot table. Click "**Layout**" in the top menu to open the layout screen. In this screen you can position your data dimensions as table columns, rows or filters by clicking and dragging the dimensions from the dimensions list to the respective column, row and filter lists. You can set any number of dimensions in any of the lists. For instance, you can click on "Organisation units" and drag it to the row list in order to position the organisation unit dimension as table rows. Note that indicators, data elements and data set reporting rates are part of the common "Data" dimension and will be displayed together in the pivot table. For instance, after selecting indicators and data elements in the left menu, you can drag "Data" from the available dimensions list to the row dimension list in order to arrange them as rows in the pivot table.

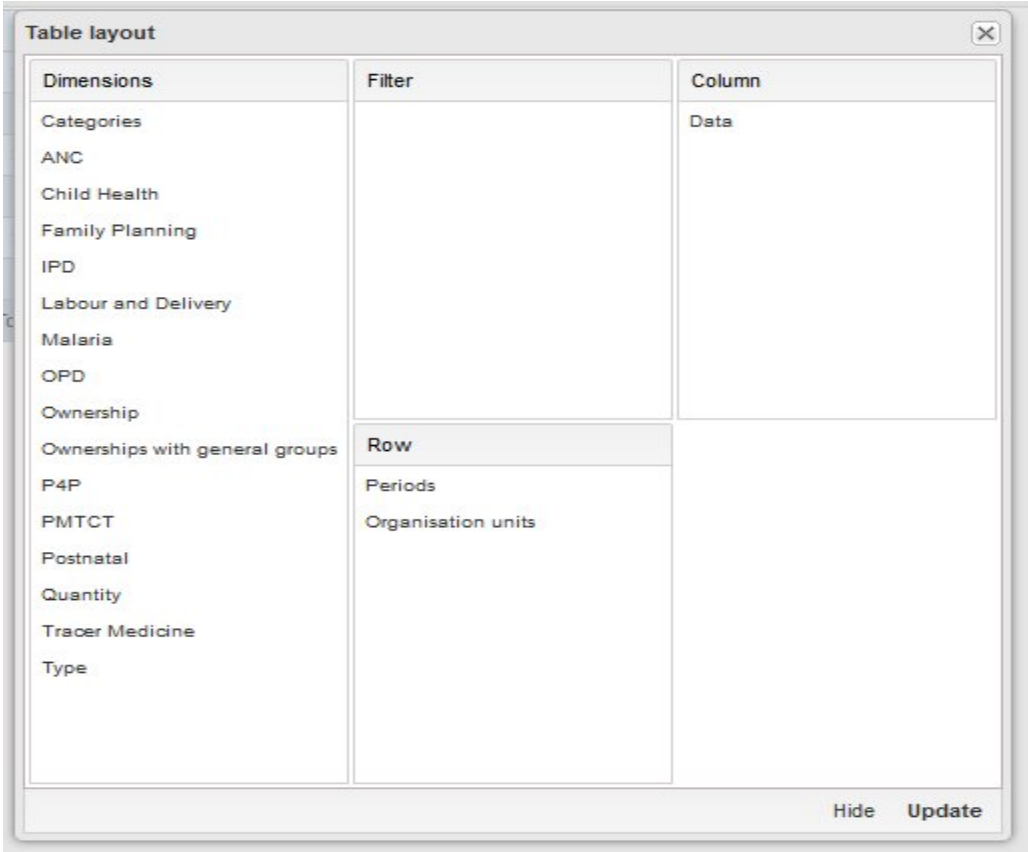
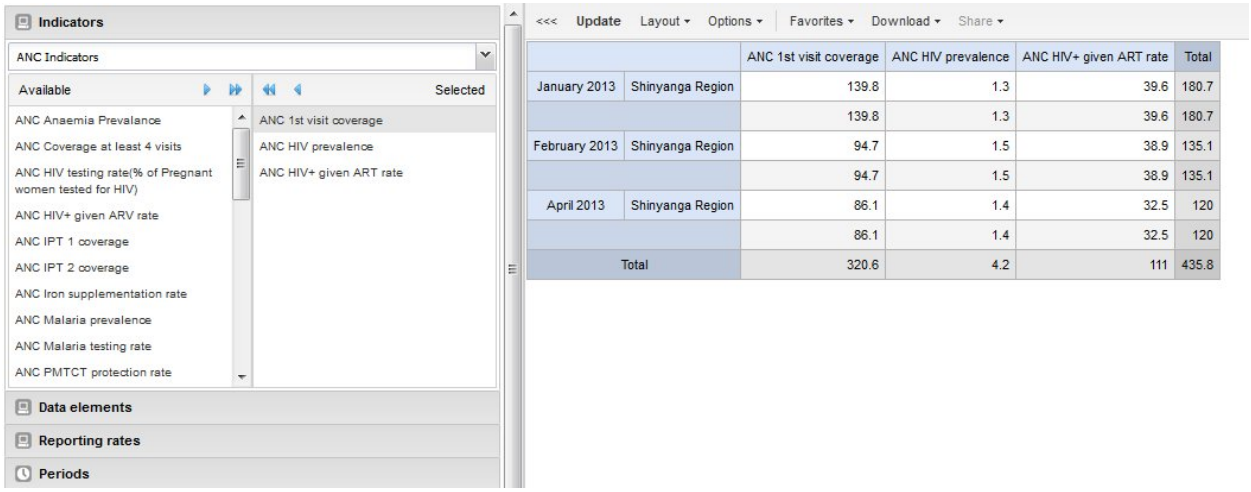


Figure 8.3: Layout option

After you have set up your pivot table you can click "**Update**" to render your pivot table, or click "**Hide**" to hide the layout screen without any changes taking effect. Since we in our example have selected both the period and organization unit dimension as rows, the pivot table will generate all combinations of the items in these dimensions and produce a table like this:



		ANC 1st visit coverage	ANC HIV prevalence	ANC HIV+ given ART rate	Total
January 2013	Shinyanga Region	139.8	1.3	39.6	180.7
		139.8	1.3	39.6	180.7
February 2013	Shinyanga Region	94.7	1.5	38.9	135.1
		94.7	1.5	38.9	135.1
April 2013	Shinyanga Region	86.1	1.4	32.5	120
		86.1	1.4	32.5	120
Total		320.6	4.2	111	435.8

Figure 8.4: Update the pivot table

8.4. Using table options

Several table options are available when working with a pivot table. Open the options screen by clicking on "**Options**" in the top menu. The options available are Show totals, Show sub-totals, Hide empty rows, Show hierarchy, Display density, Font size, Digit group separator and Legend set

8.5. Creating a favourite

When you have set up a pivot table it is convenient to save it as a favorite. To do so, click "**Favorites**" on the top menu, click "**Add new**", give the favorite a descriptive name and click "**Create**".

You can search for favorites through the search input field at the top. To load an existing favorite, simply click the name of the favorite in the list.

To rename a favorite, click the grey "**Rename**" icon next to the favorite in the list, change the name and click "**Update**". To overwrite an existing favorite with the current pivot table, click the green "**Overwrite**" icon. To share a favorite with everyone or a user group, click the blue "**Share**" icon. To delete a favorite, click the red "**Delete**" icon.

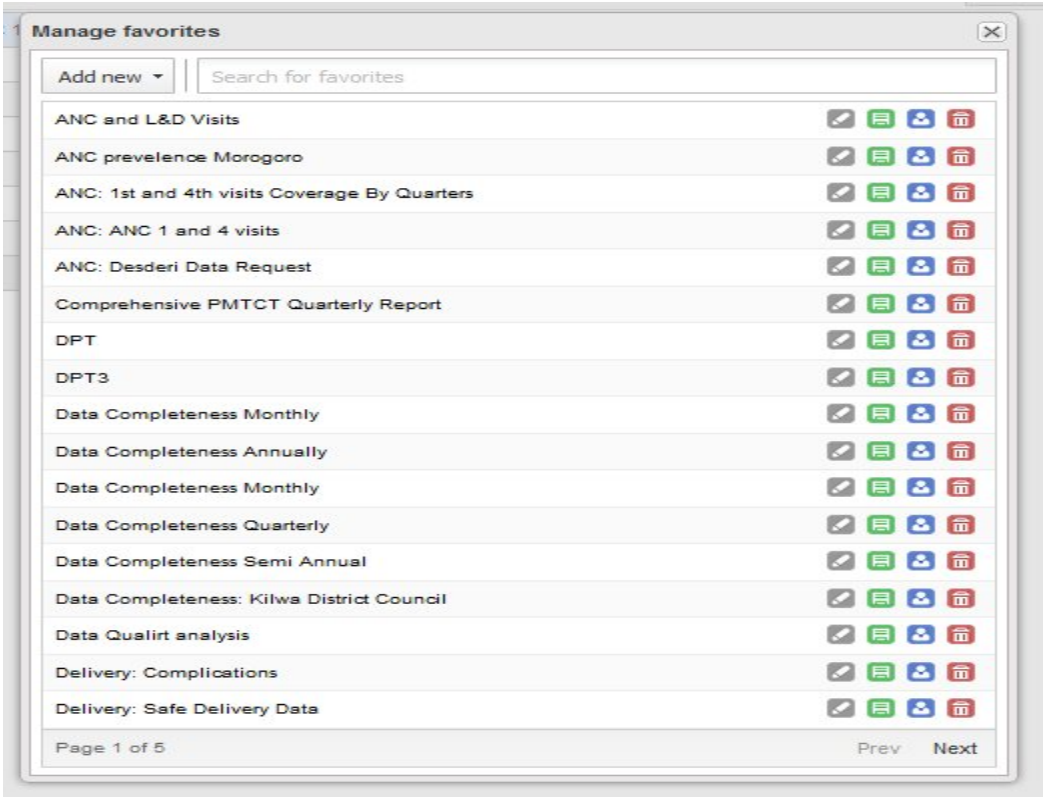


Figure 8.5: List of predefined pivot table reports

8.6. Downloading Data

You can download the data in the current pivot table by clicking on "**Download**" in the top menu. The data can be downloaded in MS Excel and CSV format. The data table will have one column per dimension and contain names of the dimension items. You can easily create a pivot table in Microsoft Excel from the downloaded Excel file by clicking on "pivot table" in the top panel, then clicking on "create pivot table", then marking the data range in the spreadsheet before clicking "**OK**".

8.7. Share interpretations

After saving or loading a favourite, the "Share" button on the toolbar is enabled. Clicking it will open up a window where you can write your interpretation of the favorite and share it with other users. Below the textarea there are links to the favorite, as pivot table and in the API respectively.

Chapter 9: Dashboard

Dashboards are intended to provide quick access to individual users to the data which has been stored in DHIS2 like “Car Dashboards”. Dashboards consist of several sections, some of which provide links to reports or mapview which have already been defined. Other sections of the dashboard allow users to add charts which have been defined and made available through the charting module.

The dashboard is the first sight you get when you log in to the DHIS 2. In case you were in other module, you can open again the dashboard by clicking on the services tab displayed in the main menu. A drop down menu will appear listing the services provided by DHIS 2. Click on the Dashboard

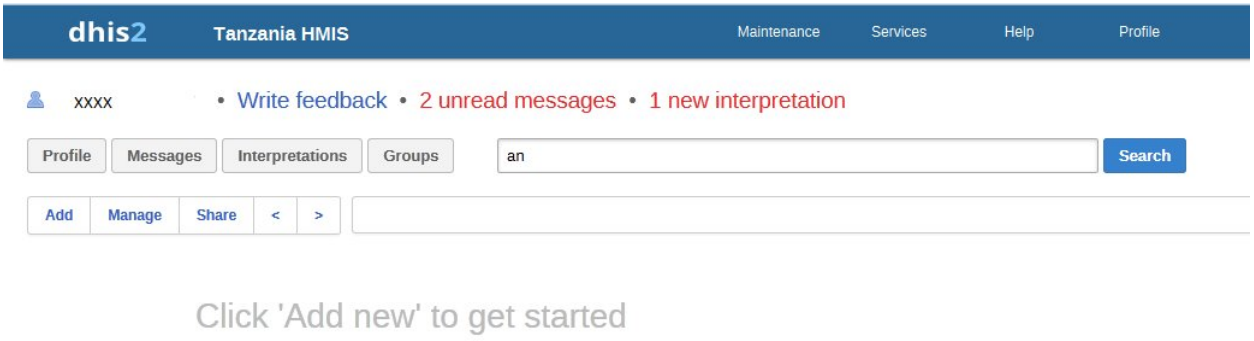


Figure 9.1: Dashboard interface

9.1. Setting up Dashboard

The DHIS2 allows creating multiple dashboards (more than one dashboard). To create a new dashboard, click “add” and in the textfield write a dashboard name.

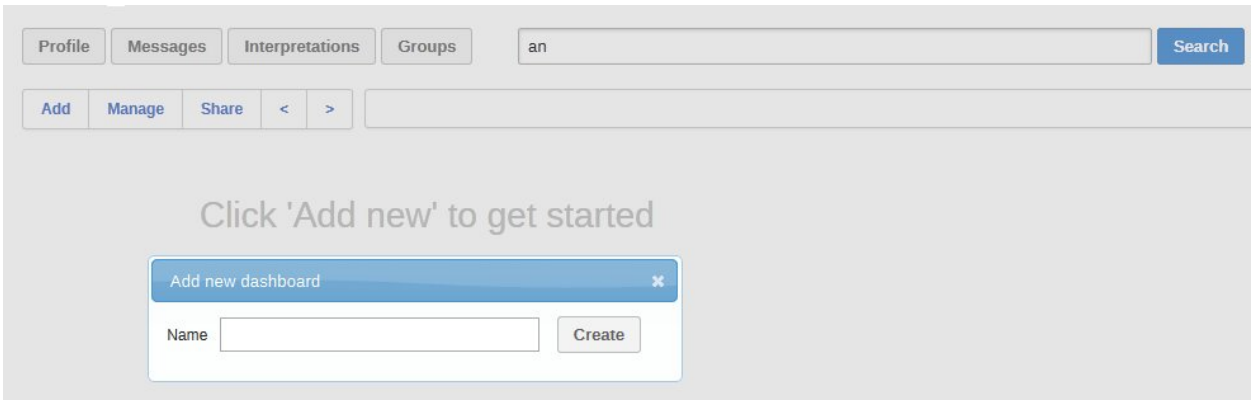


Figure 9.2: create new dashboard

To select the dashboard you want to use currently, click on the dashboard name and the colour will change to grey colour.

You can add stuff to the current dashboard by searching from the search field. When you type a keyword in search field, the list of charts will be displayed with similar keywords. Select the one you want and click add

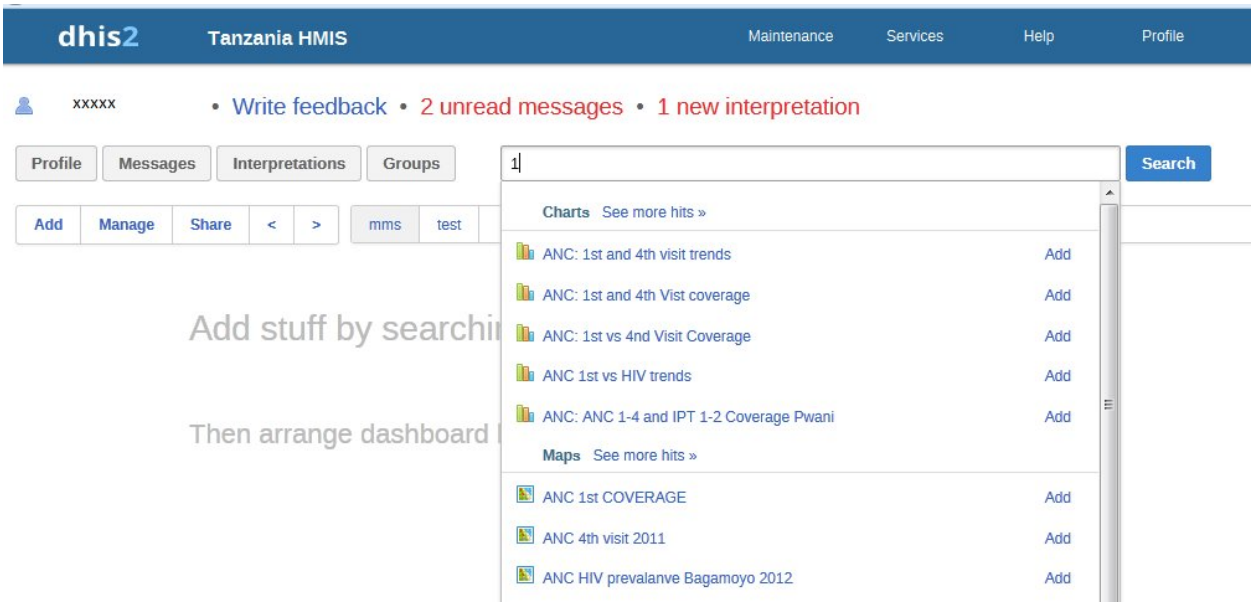


Figure 9.3: Assign a chart report to the Dashboard

Note: Dashboard is configured for each individual user. Example of dashboard for user Known as Asha Juma

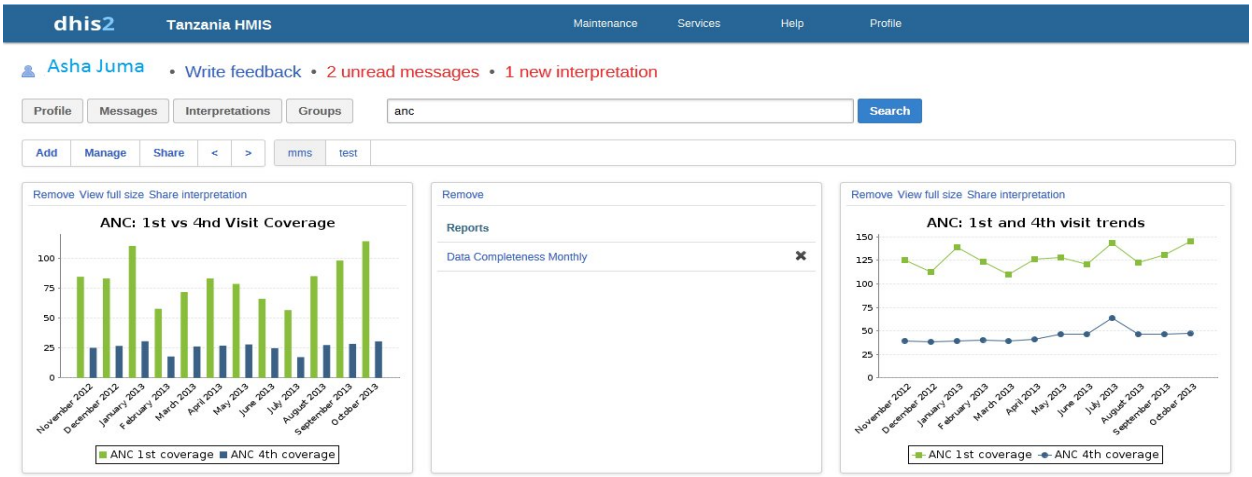


Figure 9.4: Display graph from data visualize on the dashboard

9.2. Messages and Feedback

DHIS2 has certain functions to facilitate communication between different users and user groups. This type of communication is important to facilitate feedback regarding data quality, timeliness of submissions, or to simply answer a question which a particular user may have.

Feedback messages are sent to a particular group of users and can be sent by all users who have access to the dashboard module. In order to enable the receipt of feedback messages sent from the dashboard, you must set the system setting "Feedback recipients" which is available from the Maintenance->System settings dialog. Be sure to define a user group (e.g. "Feedback recipients") with all of the users who should receive feedback messages. Refer to the section in this manual on "User groups" for more information of how to do this. Once the "Feedback recipients" user group has been defined, each time a feedback message is sent, it will appear as a message in each of the "Feedback recipients" message queue within DHIS2. Note that messages will not be sent to users email addresses, but will only appear within the DHIS2 application.

To send a new feedback message, simply select "Write feedback" from the dashboard. Provide a subject and text in the respective text boxes. The message will appear in all of the specified users message queue. Messages can be sent to specific groups of users who have been assigned to particular organisation units.

Figure 9.5: Feedback message parameters

To write a new message, simply click "Messages" from the dashboard screen and then press the "Write message" button. Select an organisation unit (or group of organisation units) from the "To org unit" organisational unit tree. Provide To user, Subject and Text. To send the message, press the "Send" button. You can discard the message by pressing the "Discard" button as seen in the screenshot below.

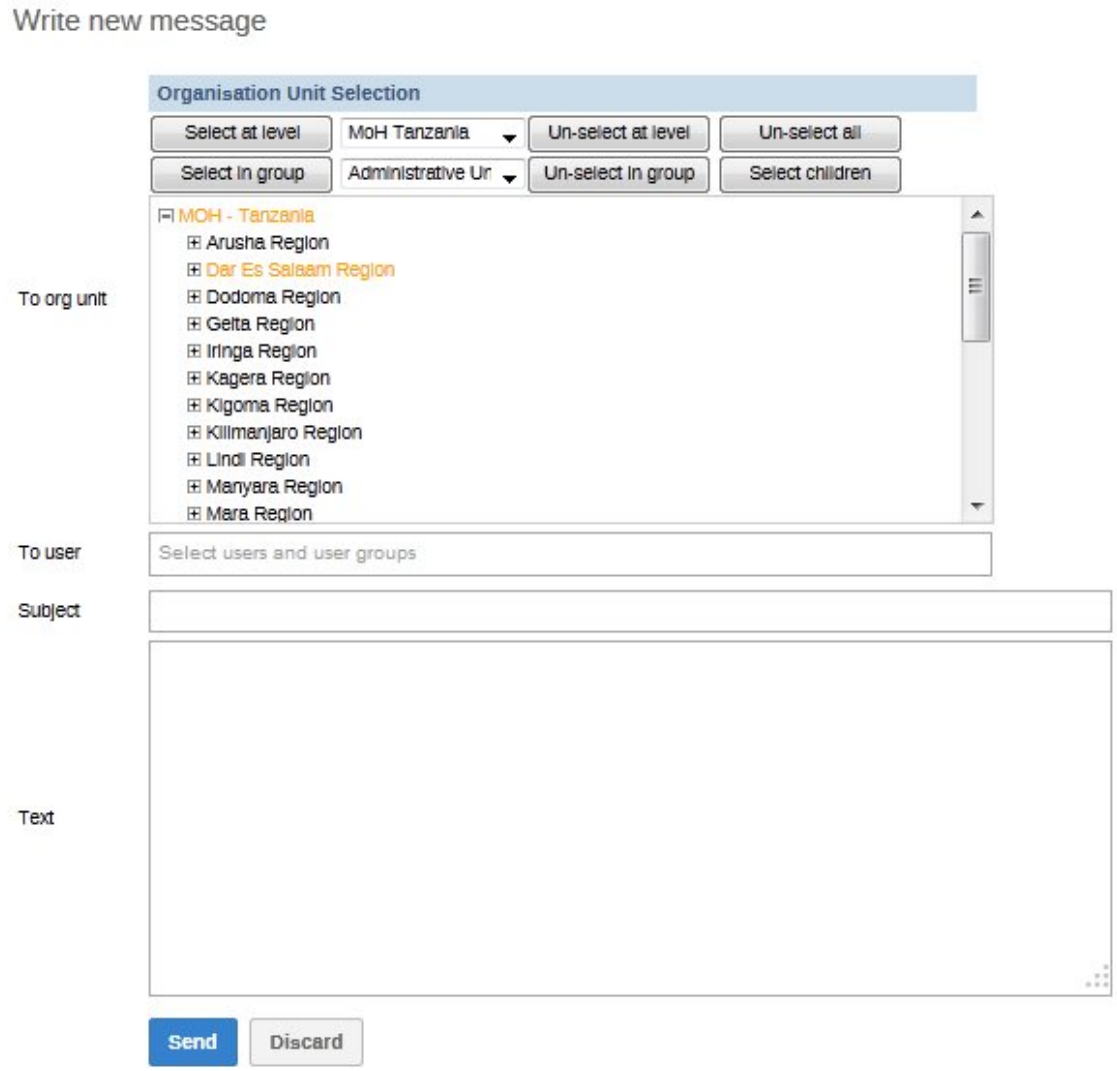


Figure 9.6: Message parameters