DHIMS2 MANUAL FOR FIRST AND SECOND LINE FACILITY SUPPORT

DHIMS2 TECHNICAL TEAM WWW.CHIMGH.ORG

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Forward

The Global fund local funding agent (LFA) in 2016 carried out a Routine Service Data Quality Audit (RSQA) and recommended strongly as part of efforts to sustain and strengthen the gains of DHIMS2 , the need to carry out a detailed capacity and skills development of all Regional and Districts Health Information Officers (HIO) to support facilities at the sub districts level.

DHIMS2 data is growing and there is the urgent need to build and orient districts key staff on the new enhanced features and use of DHIMS2 data for planning at the periphery as capacity at the district and sub districts level on DHIMS2 data use is very low. (LFA report submitted to GF)

The need for capacity and skill development of HIO

The last time the Ghana Health Service and its respective programmes carried out a national orientation on DHIMS2 was on version 2.0 in April 2012. The current version of DHIMS2 is 2.27 with more decentralised enhanced support functions for regional and districts health information officers.
Most of the regional and district level support, maintenance and management of DHIMS2 has been a burden to some few national officers and there is an urgent need to further build the capacity of regional and district HIO to perform these functions with minimal support from the national team. The current deployment of the eTracker to capture individual client based data for MCH, EID, TB care and ART clients also requires direct facility support by the district HIO.

This manual is aimed at supporting and providing step by step guide to regional and district HIO to provide 1st and 2nd line of support to all facilities in their districts.

Quick intro to designing a DHIS2 database

DHIMS2 is build on the DHIS2 platform , DHIS2 provides a powerful set of tools for data collection, validation, reporting and analysis, but the contents of the database, e.g. what to collect, who should collect it and on what format will depend on the context of use. However, in order to do anything with DHIS2, you must first create meta-data. Meta-data, or data about the data, describes what should be collected (data elements and categories), where it should be collected (organisation units) and how frequently it should be collected (periods).

This meta-data needs has been created in the DHIS2 database and its now called DHIMS2 in Ghana and managed by the Ghana Health Service.
This was done through the user interface that require a good understanding of the processes which you are trying to collect data form.

This section will provide a very quick and brief introduction to DHIS2 database design and mainly explain the various steps needed to prepare a new DHIS2 system for use. How to do each step is explained in other chapters, and best practices on design choices will be explained in the implementers manual. Here are the steps to follow:

- Set up an organisational hierarchy
- Define data elements
- Define data sets and data entry forms
- Define validation rules 5. Define indicators
- Define report tables and design reports
- Set up the GIS module 8. Design charts and customise the dashboard

The organisational hierarchy

The organisational hierarchy defines the organisation using the DHIS2, the health facilities, administrative areas and other geographical areas used in data collection and data analysis. This dimension to the data is defined as a hierarchy with one root unit (e.g. Ministry of Health) and any number of levels and nodes below. Each node in this hierarchy is called an organisational unit in DHIS2.

The design of this hierarchy will determine the geographical units of analysis available to the users as data is collected and aggregated in this structure. There can only be one organisational hierarchy at the same time so its structure needs careful consideration. Additional hierarchies (e.g. parallel administrative groupings such as "Facility ownership") can be modelled using organisational groups and group sets, however the organisational hierarchy is the main vehicle for data aggregation on the geographical dimension. Typically national organisational hierarchies in public health have 4-6 levels, but any number of levels is supported. The hierarchy is built up of parent-child relations, e.g. a Country or MoH unit (the root) might have e.g. 8 parent units (provinces), and each province again (at level 2) might have 10-15 districts as their children. Normally the health facilities will be located at the lowest level, but they can also be located at higher levels, e.g. national or provincial hospitals, so skewed organisational trees are supported (e.g. a leaf node can be positioned at level 2 while most other leaf nodes are at level 5).

Typically there is a geographical hierarchy defined by the health system. e.g. where the administrative offices are located (e.g. MoH, province, district), but often there are other administrative boundaries in the country that might or might not be added, depending on how its boundaries will improve data analysis. When designing the hierarchy the number of children for any organisational unit may indicate the usefulness of the structure.

About demo server, live package and Data Elements database design

More 1-1 relationships between two levels is not very useful as the values will be the same for the child and the parent level. On the other extreme a very high number of children in the middle of

the hierarchy (e.g. 50 districts in region) might call for an extra level to be added in between to increase the usefulness of data analysis. The lowest level, the health facilities will often have a large number of children (10-60), but for other levels higher up in the hierarchy approx. 5-20 children is recommended. Too few or too many children might indicate that a level should be removed or added.

Note that it is quite easy to make changes to the upper levels of the hierarchy at a later stage, the only problem is changing organisational units that collect data (the leaf nodes), e.g. splitting or merging health facilities. Aggregation up the hierarchy is done based on the current hierarchy at any time and will always reflect the most recent changes to the organisational structure. Refer to the chapter on Organisation Units to learn how to create organisational units and to build up the hierarchy.

Data Elements

The Data Element is perhaps the most important building block of a DHIS2 database. It represents the "WHAT" dimension, it explains what is being collected or analysed. In some contexts this is referred to an indicator, but in DHIS2 we call this unit of collection and analysis a *data element*. The data element often represents a count of something, and its name describes what is being counted, e.g. "BCG doses given" or "Malaria cases". When data is collected, validated, analysed, reported or presented it is the data elements or expressions built upon data elements that describes the WHAT of the data. As such the data elements become important for all aspects of the system and they decide not only how data is collected, but more importantly how the data values are represented in the database, which again decides how data can be analysed and presented.

It is possible to add more details to this "WHAT" dimension through the disaggregation dimension called data element categories. Some common categories are Age and Gender, but any category can be added by the user and linked to specific data elements. The combination of a data element's name and its assigned category defines the smallest unit of collection and analysis available in the system, and hence describes the raw data in the database. Aggregations can be done when zooming out of this dimension, but no further drill-down is possible, so designing data elements and categories define the detail of the analysis available to the system (on the WHAT dimension). Changes to data elements and categories at a later stage in the process might be complicated as these will change the meaning of the data values already captured in the database (if any). So this step is one of the more decisive and careful steps in the database design process.

One best practice when designing data elements is to think of data elements as a unit of data analysis and not just as a field in the data collection form. Each data element lives on its own in the database, completely detached from the collection form, and reports and other outputs are based on data elements and expressions/formulas composed of data elements and not the data collection forms. So the data analysis needs should drive the process, and not the look an feel of the data collection forms. A simple rule of thumb is that the name of the data element must be able to stand on its own and describe the data value also outside the context of its collection form. E.g. a data element name like "Total referrals" makes sense when looking at it in either the "RCH" form or the "OPD" form, but on its own it does not uniquely describe the phenomena (who are being referred?), and should in stead be called "Total referrals from Maternity" or "Total referrals from OPD". Two different data elements with different meanings, although the field on the paper form might only say "Total referrals" since the user of the form will always know where these referrals come from. In a database or a repository of data elements this context is no longer valid and therefore the names of the data elements become so important in describing the data.

Common properties of data elements can be modelled through what is called data element groups. The groups are completely flexible in the sense that they are defined by the user,

both their names and their memberships. Groups are useful both for browsing and presenting related data, but can also be used to aggregate data elements together. Groups are loosely

coupled to data elements and not tied directly to the data values which means they can be modified and added at any point in time without interfering with the raw data.

Datasets and data entry forms

All data entry in DHIS2 is organised through the use of Datasets. A Dataset is a collection of data elements grouped together for data collection, and in the case of distributed installs they also define chunks of data for export and import between instances of DHIS2 (e.g. from a district office local installation to a national server). Datasets are not linked directly to the data values, only through their data elements and frequencies, and as such a dataset can be modified, deleted or added at any point in time without affecting the raw data already captured in the system, but such changes will of course affect how new data will be collected.

A dataset has a period type which controls the data collection frequency, which can be daily, weekly, monthly, quarterly, six-monthly, or yearly. Both which data elements to include in the dataset and the period type is defined by the user, together with a name, short name, and code.

In order to use a dataset to collect data for a specific orgunit you must assign the orgunit to the dataset, and this mechanism controls which orgunits that can use which datasets, and at the same time defines the target values for data completeness (e.g. how many health facilities in a district expected to submit RCH data every month).

A data element can belong to multiple datasets, but this requires careful thinking as it may lead to overlapping and inconstant data being collected if e.g. the datasets are given different frequencies and are used by the same orgunits.

Data entry forms

Once you have assigned a dataset to an orgunit that dataset will be made available in Data Entry (under Services) for the orgunits you have assigned it to and for the valid periods according to the dataset's period type. A default data entry form will then be shown, which is simply a list of the data elements belonging to the dataset together with a column for inputting the values. If your dataset contains data elements with categories such as age groups or gender, then additional columns will be automatically generated in the default form based on the categories. In addition to the default list-based data entry form there are two more alternatives, the section-based form and the custom form.

Section forms

Section forms allow for a bit more flexibility when it comes to using tabular forms and are quick and simple to design. Often your data entry form will need multiple tables with subheadings, and sometimes you need to disable (grey out) a few fields in the table (e.g. some categories do not apply to all data elements), both of these functions are supported in section forms. After defining a dataset you can define it's sections with subsets of data elements, a heading and possible grey fields i the section's table. The order of sections in a dataset can also be defined. In Data Entry you can now start using the Section form (should appear automatically when sections are available for the selected dataset). You can switch between default and section forms in the top right corner of the data entry screen. Most tabular data entry forms should be possible to do with sections forms, and the more you can utilise the section forms (or default forms) the easier it is for you. If these two types of forms are not meeting your requirements then the third option is the completely flexible, although more time-consuming, custom data entry forms.

Custom Forms

When the form you want to design is too complicated for the default or section forms then your last option is to use a custom form. This takes more time, but gives you full flexibility in term of the design. In DHIS2 there is a built in HTML editor (FcK Editor) for the form designer and you can

either design the form in the UI or paste in your HTML directly using the Source window in the editor. In the custom form you can insert static text or data fields (linked to data elements + category) in any position on the form and you have complete freedom to design the layout of the form. Once a custom form has been added to a dataset it will be available in data entry and used automatically. You can switch back to default and section (if exists) forms in the top right corner of the data entry screen.

Validation rules

Once you have set up the data entry part of the system and started to collect data then there is time to define data quality checks that help to improve the quality of the data being collected. You can add as many validation rules as you like and these are composed of left and right side expressions that again are composed of data elements, with an operator between the two sides. Typical rules are comparing subtotals to totals of something. E.g. if you have two data elements "HIV tests taken" and "HIV test result positive" then you know that in the same form (for the same period and organisational unit) the total number of tests must always be equal or higher than the number of positive tests. These rules should be absolute rules meaning that they are mathematically correct and not just assumptions or "most of the time correct". The rules can be run in data entry, after filling each form, or as a more batch like process on multiple forms at the same time, e.g. for all facilities for the previous reporting month. The results of the tests will list all violations and the detailed values for each side of the expression where the violation occurred to make it easy to go back to data entry and correct the values.

Indicators

Indicators represent perhaps the most powerful data analysis feature of the DHIS2. While data elements represent the raw data (counts) being collected the indicators represent formulas providing coverage rates, incidence rates, ratios and other formula-based units of analysis. An indicator is made up of a factor (e.g. 1, 100, 100, 100 000), a numerator and a denominator, the two latter are both expressions based on one or more data elements. E.g. the indicator "BCG coverage <1 year" is defined a formula with a factor 100, a numerator ("BCG doses given to children under 1 year") and a denominator ("Target population under 1 year"). The indicator "DPT1 to DPT3 drop out rate" is a formula of 100 % x ("DPT1 doses given"- "DPT3 doses given") / ("DPT1 doses given").

Most report modules in DHIS2 support both data elements and indicators and you can also combine these in custom reports, but the important difference and strength of indicators versus raw data (data element's data values) is the ability to compare data across different geographical areas (e.g. highly populated vs rural areas) as the target population can be used in the denominator.

Indicators can be added, modified and deleted at any point in time without interfering with the data values in the database.

Report tables and reports

Standard reports in DHIS2 are a very flexible way of presenting the data that has been collected. Data can be aggregated by any organisational unit or orgunit level, by data element, by indicators, as well as over time (e.g. monthly, quarterly, yearly). The report tables are custom data sources for the standard reports and can be flexibly defined in the user interface and later accessed in external report designers such as iReport or through custom HTML reports. These report designs can then be set up as easily accessible one-click reports with parameters so that the users can run the same reports e.g. every month when new data is entered, and also be relevant to users at all levels as the organisational unit can be selected at the time of running the report.

GIS

In the integrated GIS module you can easily display your data on maps, both on polygons (areas) and as points (health facilities), and either as data elements or indicators. By providing the coordinates of your organisational units to the system you can quickly get up to speed with this module. See the GIS section for details on how to get started.

Charts and dashboard

On of the easiest way to display your indicator data is through charts. An easy to use chart dialogue will guide you through the creation of various types of charts with data on indicators, organisational units and periods of your choice. These charts can easily be added to one of the four chart sections on your dashboard and there be made easily available right after log in. Make sure to set the dashboard module as the start module in user settings.

Using the Data Entry app

About the Data Entry app

The **Data Entry** app is where you manually enter aggregated data in DHIS2. You register data for an organisation unit, a period, and a set of data elements (data set) at a time. A data set often corresponds to a paper-based data collection tool. You configure the data sets in the **Maintenance** app.

A data set can have both section and custom forms

If a data set has both a section form and a custom form, the system displays the custom form during data entry. Users who enter data can't select which form they want to use. In web-based data entry the order of display preference is:

1. Custom form (if it exists)

2. Section form (if it exists)

3. Default form

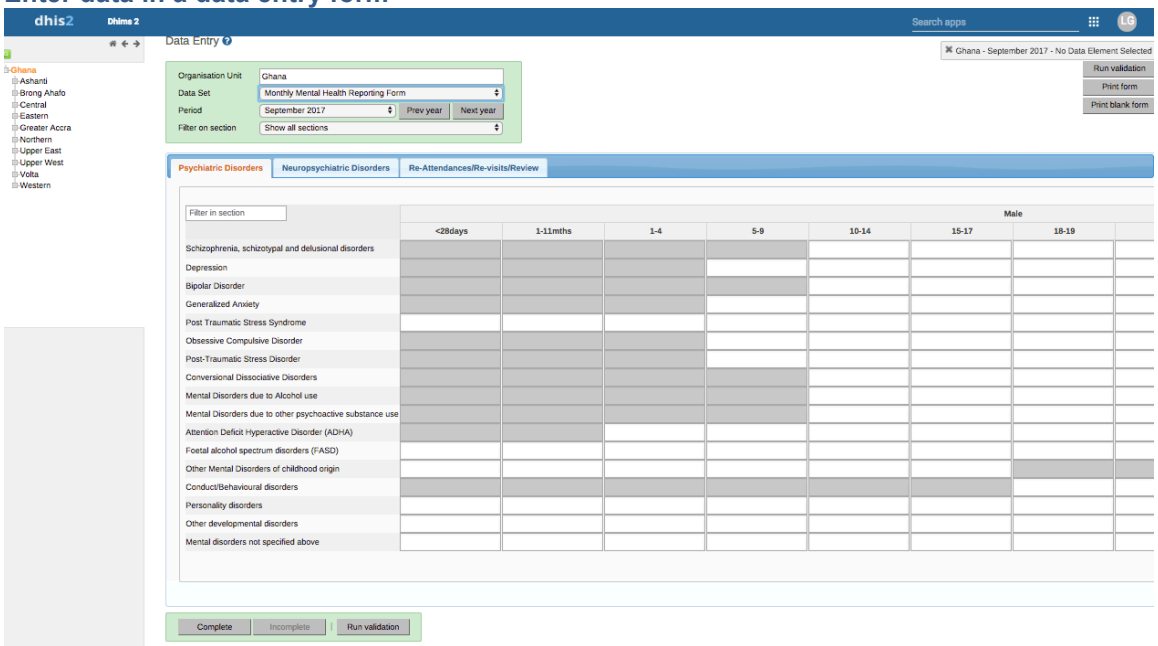
Mobile devices do not support custom forms. In mobile-based data entry the order of display preference is:

1. Section form (if it exists)

2. Default form

When you close an organisation unit, you can't register or edit data to this organisation unit in the **Data Entry** app.

Enter data in a data entry form



Using the Data Entry app Enter data in a data entry form

1. Open the **Data Entry** app.

2. In the organisation unit tree to the left, select an organisation unit.

3. Select a **Data set**.

4. Select a **Period**.

5. The available periods are controlled by the period type of the data set (reporting frequency). You can jump a year back or forward by clicking **Prev year** or **Next year**.

6. **Note** Depending on how you've configured the data entry form, you might have to enter additional information before you can open the date entry form. This can for example be a project derived from a category combination.

7. Enter data in the data entry form.

- A green field means that the system has saved the value.
- A grey field means that the field is disabled and you can't enter a value. The cursor will automatically jump to the next open field.
- To move to the next field, press the Tab key or the Down Arrow key.
- To move back to the previous field, press Shift+Tab or the Up Arrow key.
- If you type in an invalid value, for example a character in a field that only accepts numeric values, you'll get a pop-up that explains the problem and the field will be coloured yellow (not saved) until you have corrected the value.
- If you have defined a minimum maximum value range for the field and you enter a value that is outside this range, you'll get a pop-up message that says the value is out of range. The value remains unsaved until you've changed the value or updated the value range and then re-entered the value.

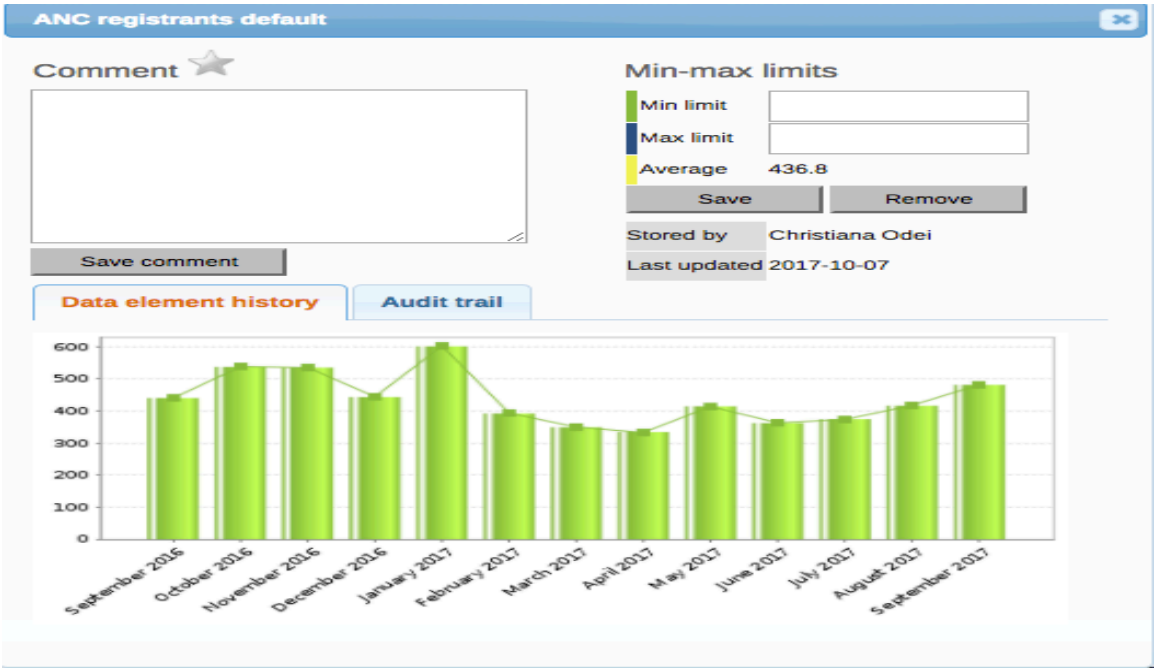
8. When you've filled in the form, click **Run validation** in the top right corner or below the data entry form. All validation rules which involves data elements in the current data entry form (data set) are then run against the new data. If there are no violations of the validation rules, you'll see a message saying *The data entry screen successfully passed validation*. If there are validation violations, they will be presented in a list.

9. (Optional) Correct validation violations. **Note** Zero (0) will delete the value if the data element has been configured to not store zeros.

10. When you've corrected errors and you're done with data entry, click **Complete**. The system uses this information when generating completeness reports for district, county, province or the national level.

Using the Data Entry app Mark a data value for follow-up

Mark a data value for follow-up



If you for example have a suspicious value that you need to investigate further, you can keep it the system, but mark it for follow-up. In the **Data Quality** app you can then run a follow-up analysis to view and correct all marked values.

1. Open the **Data Entry** app.

2. Open an existing data entry form.

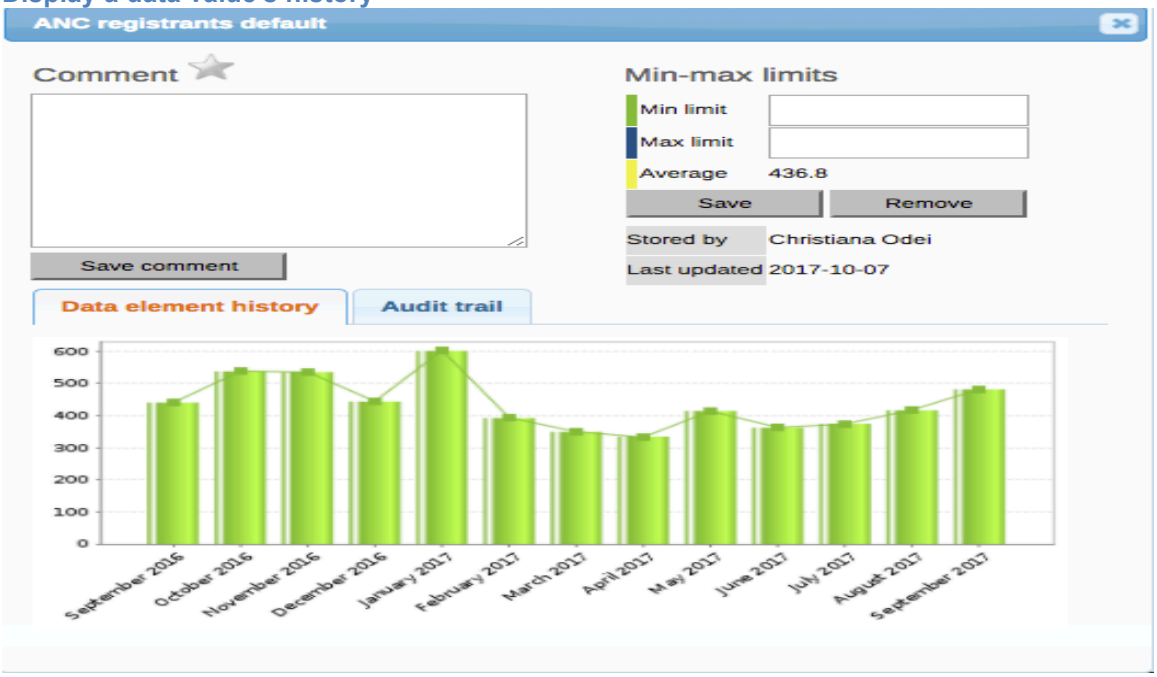
3. Double-click the field with the value you want to mark for follow-up.

4. Click the star icon.

Edit data values in a completed data entry form

1. Open the **Data Entry** app.
2. Open an existing data entry form.
3. Click **Incomplete**.
4. Change the relevant data values.
5. Click **Complete**.

Display a data value's history



You can display the last 12 values registered for a field.

1. Open the **Data Entry** app.

2. Open an existing data entry form.

3. Double-click the field with the value you want to view the history for.

4. Click **Data element history**.

Display a data value's audit trail

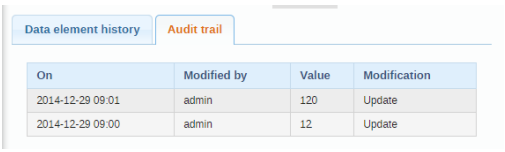
The audit trail allows you to view other data values which have been entered prior to the current value. The audit trail also shows when the data value was altered and which user who made the changes.

1. Open the **Data Entry** app.

2. Open an existing data entry form.

3. Double-click the field with the value you want to view the audit trail for.

4. Click **Audit trail**.



1. (Optional) Click **Save comment**.

2. **Tip** Click the star icon to mark the value for further follow-up.

Enter data offline

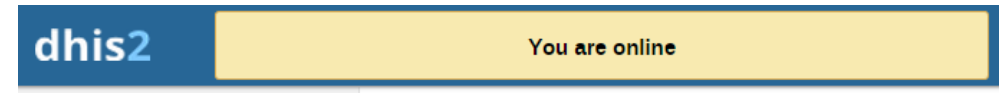
The **Data Entry** app works even if you don't have a stable Internet connection during data entry. When you don't have an internet connection, the data you enter is saved to your local computer. When the Internet connection is back, the app will push the data to the server. The total bandwidth usage is reduced since data entry forms no longer are retrieved from the server for each rendering.

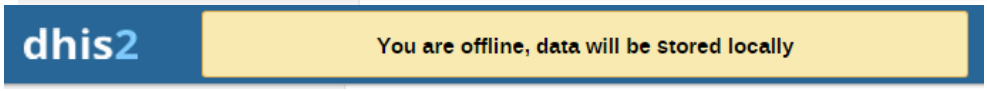
Note

To use this functionality, you must login to the server while you've an Internet connection.

• When you're connected to the Internet, the app displays this message at the top of the data entry form:

• If your Internet connection breaks during data entry, the app detects it and displays this message:

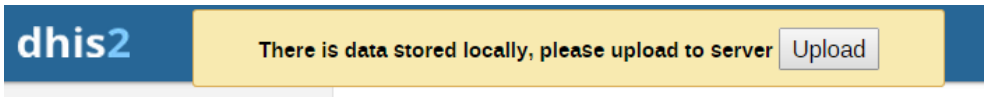




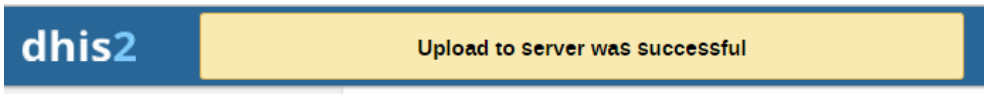
Now your data will be stored locally. You can continue to enter data as normal.

• Once you have entered all necessary data and the app detects that the Internet connection is back, you'll see this message:

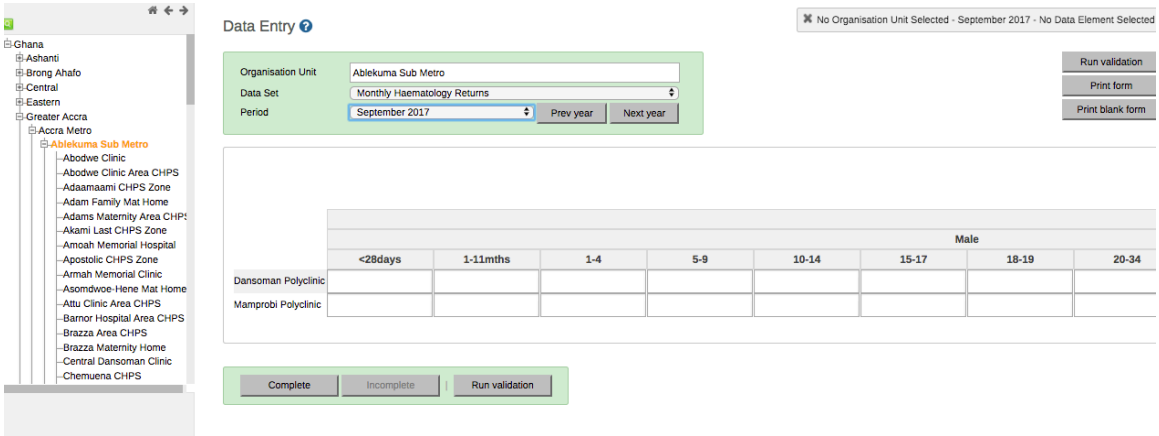
Click **Upload** to synchronize data with the server.



When the data has successfully synchronized with the server, you'll see this confirmation message:



Enable multi-organisation unit data entry



It can be useful to enter data for multiple organisation units in the same data entry form, for instance if there are few data elements in the form and a huge number of organisation units in the hierarchy. In that case, you can enable multi-organisation unit data entry.

Note

Multi-organisation unit data entry only works for section forms.

1. Open the **System Settings** app.

2. Select **Enable multi-organisation unit forms**.

3. In the **Data Entry** app, select the organisation unit immediately above the organisation unit you want to enter data for in the organisation unit hierarchy. Data elements will appear as columns and organisation units as rows in the form.

Note The data entry forms should still be assigned to the facilities that you actually enter data for, that is the organisation units now appearing in the form.

Control data quality

About data quality checks

The **Data Quality** app contains tools to validate the accuracy and reliability of the data in the system. You can verify the data quality with the help of validation rules and various statistical checks. Data quality has different dimensions including:

Dimension	Description
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.
Completeness	Data for all data elements for all reporting organisation units should have been submitted.
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.
Timeliness	All data from all reporting organisation units should be submitted at the appointed time.

You can verify data quality in different ways, for example:

1. At point of data entry, DHIS2 can check the data entered to see if it falls within the minimum maximum value ranges of that data element (based on all previous data registered).
2. By defining validation rules, which can be run once the user has finished data entry. The user can also check the entered data for a particular period and organization unit(s) against the validation rules, and display the violations for these validation rules.
3. By analysing data sets, that is, examine gaps in the data.
4. By data triangulation, that is, comparing the same data or indicator from different sources.

Validation rule analysis

About validation rule analysis

A validation rule is based on an expression which defines a relationship between data element values. The expression forms a condition which should assert that certain logical criteria are met. The expression consist of:

• a left side

• a right side

• an operator

Example

A validation rule could assert that "Suspected malaria cases tested" >= "Confirmed malaria cases".

Control data quality Workflow

The validation rule analysis tests validation rules against the data registered in the system. Validation violations are reported when the condition defined in the validation rule expression is not met, which means when the condition is false.

You can configure a validation rule analysis to automatically send out information about validation violations to selected user groups. These messages are called *validation notifications* and you create them in the **Maintenance** app. Validation notifications are sent via the internal DHIS2 messaging system.

Workflow

3. In the **Maintenance** app, create validation rules and validation rule groups.

4. (Optional) In the **Maintenance** app, create validation notifications.

5. Run the validation rule analysis, either automatically or manually.

In the **Data Administration** app, you schedule the validation rule analysis to run automatically for all validation rules included in one or several validation notifications. After the system has run the analysis, you'll see the validation violations (if any) in the validation notifications sent via the internal DHIS2 messaging system.

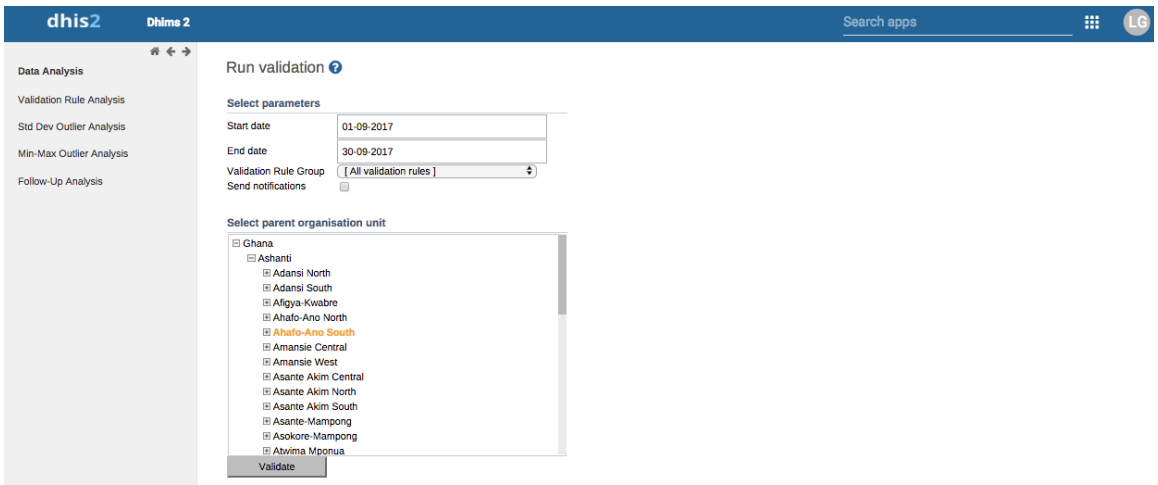
In the **Data Quality** app, you run the validation rule analysis manually for selected validation rules. After the analysis process has finished, you'll see a list of validation violations (if any).

Schedule a validation rule analysis to run automatically

Note: Only validation rules that are included in one or several validation notifications will be a part of the validation rule analysis. If there's no corresponding validation notification for a validation rule, the system has nowhere to send the validation violations.

- Verify that you have created all the validation rules, validation rule groups and validation notifications you need.
- Open the **Data Administration** app and click **Scheduling**.
- If scheduling is active, click **Stop**.
- In the **Data monitoring** section, select **All daily**.
- Click **Start**.

Run a validation rule analysis manually



1. Verify that you have created all the validation rules, validation rule groups and validation notifications you need.
2. Open the **Data Quality** app and click **Validation rule analysis**.
3. Select **Start date** and **End date**.
4. Select which **Validation rule group** you want to include in the analysis. You can select all validation rules or all validation rules from a single validation rule group.
5. (Optional) Select **Send notifications** to trigger validation notifications.

Note If you want to send out validation notifications, you must first create them in the **Maintenance** app.

1. Select a **Parent organisation unit**.
2. Click **Validate**. The analysis process duration depends on the amount of data that is being analysed. If there are no violations of the validation rules, you'll see a message saying *Validation passed successfully*. If there are validation violations, they will be presented in a list.

Run validation

Validation alerts - Ahafo-Ano South

Start date: 2017-09-01
End date: 2017-09-30

Download as PDF | Download as Excel | Download as CSV | Done

25 values found

Organisation unit	Period	Importance	Validation Rule	Value	Operator	Value	Details
Adeambra CHPS Zone	September 2017	High	Sum of Severe, moderate and normal attendant (24-59months) == Total children weight (Attendants) 24-59 months-Male+Female	0.0	==	35.0	
Adeambra CHPS Zone	September 2017	High	Sum of Severe, moderate and normal attendant (12-23months) == Total children weight (Attendants) 12-23 months-Male+Female	1.0	==	19.0	
Adukrom CHPS Zone	September 2017	High	Sum of Severe, moderate and normal attendant (24-59months) == Total children weight (Attendants) 24-59 months-Male+Female	354.0	==	177.0	
Asuodei CHPS Zone	September 2017	High	Sum of Severe, moderate and normal attendant (24-59months) == Total children weight (Attendants) 24-59 months-Male+Female	105.0	==	78.0	
Asuodei CHPS Zone	September 2017	High	Sum of Severe, moderate and normal attendant (12-23months) == Total children weight (Attendants) 12-23 months-Male+Female	117.0	==	120.0	
Barniekrom CHPS Zone	September 2017	High	Sum of Severe, moderate and normal attendant (24-59months) == Total children weight (Attendants) 24-59 months-Male+Female	0.0	==	119.0	
Biemso RCH	September 2017	High	Sum of Severe, moderate and normal attendant (24-59months) == Total children weight (Attendants) 24-59 months-Male+Female	110.0	==	111.0	
Bonkwaso CHPS Zone	September	High	Sum of Severe, moderate and normal attendant (24-59months) == Total children weight (Attendants) 24-59	45.0	==	46.0	

3. (Optional) Click the show details icon to get more information about a validation violation. In the pop-up window you'll find information about the data elements included in the validation rules and their corresponding data values. You can use this information to identify the source of the validation rule violation.
4. (Optional) Click **Download as PDF**, **Download as Excel** or **Download as CSV** to download the validation violations list in PDF, Excel or CSV formats.

Using reporting functionality

Reporting functionality in DHIS2

The reporting module in DHIS2 provides a range of reporting alternatives, and this section will explain how to use them to view and analyse data. Another section explains how to configure and set up the various reporting tools.

Standard reports: Standard reports are built on pivot tables, but are more advanced in its design allowing for more cosmetics and styles. These reports can also combine multiple tables and charts in the same report and be made available as one-click reports that are very easy to use. These reports can be downloaded as PDF files which makes them ideal for printing as well as sharing offline.

Dataset reports: Dataset reports are simply a printer friendly way to look at the data entry forms with either raw or aggregated data (over time or place). The design used in data entry will be used also in the data set reports. This will work only for data sets that has a custom data entry form set up.

Dashboard: The fastest way to view your data. The dashboard can display up to four updated charts as well as shortcuts to your favourite reports, report tables, and map views. Each user can configure a personal dashboard.

Data Visualizer: Do flexible visualizations of your data as charts and data tables. Any number of indicators and data elements can be included. Several chart types are available, such as column, stacked column, line, area and pie charts. The charts can be saved in order to be easily retrieved later and can also be put on your personal dashboard. Charts can be downloaded as image and PDF files to your local computer.

Orgunit distribution reports: These reports are generated off the orgunit group set information and can show what types (and how many of each type) of health facilities that are located in a given area (any level in the hierarchy). These reports are automatically generated and display the information in both tables and charts, and downloads in PDF, excel, and CSV are available.

Reporting rate summary: These reports provide a nice overview of how many facilities that have submitted their data for a given dataset and period. Here you can get both the counts and the percentages showing the reporting rate for all or single data sets.

Web-based pivot tables: The built in pivot table tool is a web-based tool to display indicator data by orgunit and period in a typical pivot table view and allows for pivoting manipulations of the tables. It allows for large amounts of data to be downloaded offline for analysis as well.

GIS: Present and analyse your data using thematic maps. You can view both data elements and indicators and given that you have coordinates for all your orgunits you can drill down the hierarchy and view maps for all levels from country polygons to facility points. See the separate chapter on GIS for more details. All the map information is built into DHIS2 and all you need to do is to register coordinates for your organisation units and the maps will be available.

Using dataset reports

Dataset reports are printer friendly views of the data entry screen filled with either raw or aggregated data. These are only available for data sets that have custom data entry forms and not for default or section forms.

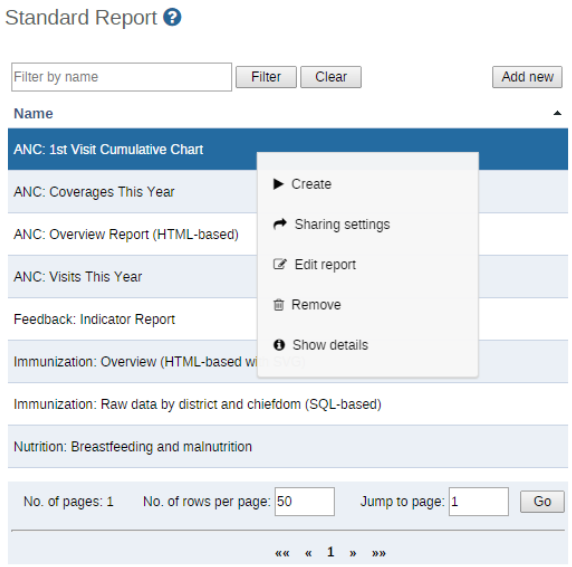
You can access data set reports from Apps->Reports. A Criteria window will appear where you fill in the details for your report: **Dataset:** The data set you want to display.

Reporting period: The actual period you want data for. This can be aggregated as well as raw periods. This means that you can ask for a quarterly or annual report even though the data set is collected monthly. A data set's period type (collection frequency) is defined in data set maintenance. First select the period type (Monthly, Quarterly, Yearly etc.) in the drop down next to Prev and Next buttons, and then select one of the available periods from the dropdown list below. Use Prev and Next to jump one year back or forward.

Use data for selected unit only: Use this option if you want a report for an orgunit that has children, but only want the data collected directly for this unit and not the data collected by its children. If you want a typical aggregated report for an orgunit you do not want to tick this option.

Reporting Organisation unit: Here you select the orgunit you want the report for. This can be at any level in the hierarchy as the data will be aggregated up to this level automatically (if you do not tick the option above).

When you are done filling in the report criteria you click on "Generate". The report will appear as HTML in a printer-friendly format. Use the print and save as functions in the browser to print or save (as HTML) the report.You can also export the data set report in Excel and PDF formats.



Using resources

The resource tool allows you to upload both files from your local computer to the DHIS server and to add links to other resources on the Internet through URLs. If cloud storage is configured for your system, resources will be saved there.

To create a new resource:

1. Open the **Reports** app and click **Resource**.

2. Click **Add new**.

3. Enter a **Name**.

4. Select a **Type**: **Upload file** or **External URL**.

5. Click **Save**.

Using reporting rate summary

Access the reporting rate summary from the Apps->Reports menu. Reporting rate summaries will show how many datasets (forms) that have been submitted by organisation unit and period. There are two methods available to calculate reporting rates (completeness):

- Based on complete data set registrations. A complete data set registration refers to a user marking a data entry form as complete, typically by clicking the complete button in the data entry screen, hereby indicating to the system that she considers the form to be complete. This is i.e. a subjective approach to calculating completeness.
- Based on compulsory data element: You can define any number of data elements in a data set to be compulsory. This implies that data values must be captured for all data elements which have been marked as compulsory in order for the data set to be considered complete. This is i.e. an objective approach to calculating completeness. The reporting rate summary will for each row show a range of measures:
- Actual reports: Indicates the number of data entry complete registrations for the relevant data set.
- Expected reports: Indicates how many data entry complete registrations are expected. This number is based on the number of organisation units the relevant data set has been assigned to (enabled for data entry).
- Percent: The percentage of reports registered as complete based on the number expected.
- Reports on time: Same as actual reports, only reports registered as complete within the maximum number of days after the end of the reporting period. This number of days after reporting period can be defined per data set in the data set management.
- Percent on time: Same as percentage, only reports registered as complete on time used as numerator. To run the report you can follow these steps:
- Select an orgunit from the tree.
- Select one of the completeness methods to use to calculate the reporting rates. Select all or one data set. All will give you a report with all data sets for the selected organisation unit. A single data set will give you a report with completeness for all children of the selected organisation unit.
- Select a period type and a period from the list of available periods for that period type. Move back/forward one year by using the prev/next buttons.
- The report will then be rendered. Change any of the parameters above and the report will be updated automatically.

Using organisation unit distribution reports

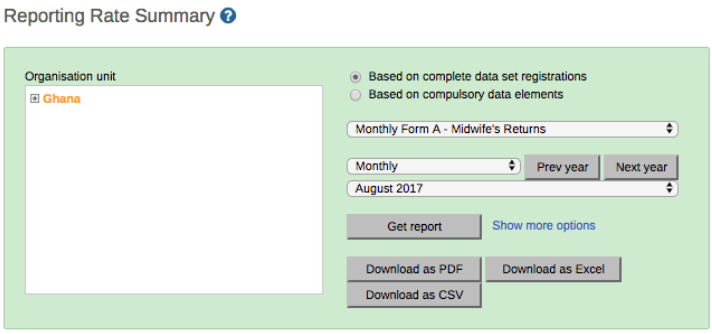
You can access the Orgunit Distribution reports from the left side menu in the Apps->Reports.

Orgunit distribution reports are reports that show how the orgunits are distributed on various properties like type and ownership, and by geographical areas.

The result can be presented in a table-based report or in a chart.

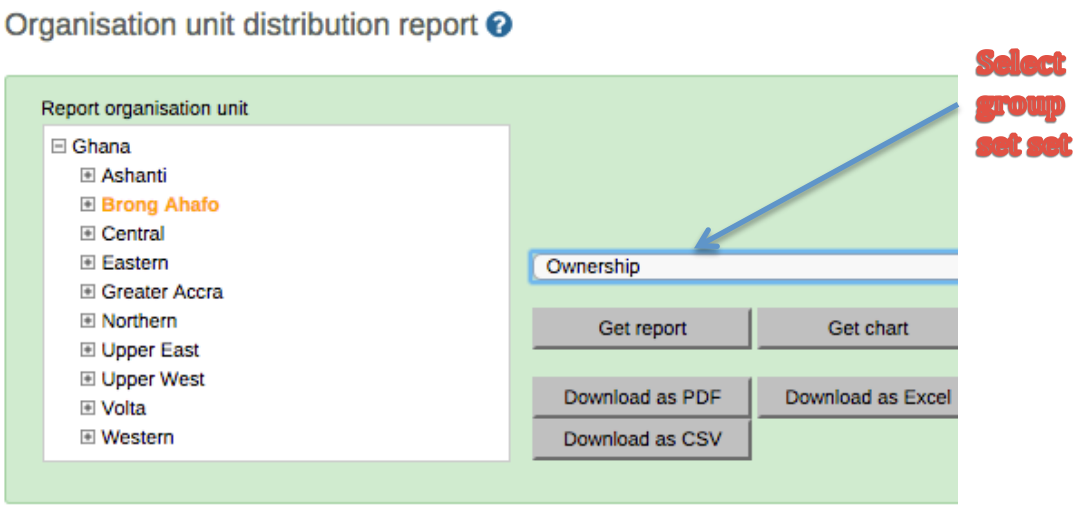
Running a report:

To run a report first select an orgunit in the upper left side orgunit tree. The report will be based on orgunits located under the selected orgunit. Then select the orgunit group set that you want to use, typically these are Type, Ownership, Care level etc, but can be any user-defined orgunit group set. 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. You can also download other format such as PDF, Excel and CSV.



Ghana - Monthly Form A - Midwife's Returns - August 2017

Name	Actual Reports	Expected Reports	Percent	Reports On Time	Percent On Time
Western	548	548	100	546	99.6
Eastern	745	745	100	703	94.4
Brong Ahafo	337	337	100	329	97.6
Upper West	355	355	100	346	97.5
Upper East	340	340	100	330	97.1


Organisation unit distribution report
Report organisation unit
Ghana
Ashanti
Brong Ahafo
Central
Eastern
Greater Accra
Northern
Upper East
Upper West
Volta
Western
Ownership
Get report
Get chart
Download as PDF
Download as Excel
Download as CSV
Select group set set

Analyze data in pivot tables

About the Pivot Table app

With the **Pivot Table** app, you can create pivot tables based on all available data dimensions in DHIS2. A pivot table is a dynamic tool for data analysis which lets you summarize and arrange data according to its dimensions. Examples of data dimensions in DHIS2 are:

• Data dimension itself (for example data elements, indicators and events)

• Periods (representing the time period for the data) • organisation hierarchy (representing the geographical location of the data)

From these dimensions you can freely select *dimension items* to include in the pivot table. You can create additional dimensions in DHIS2 with the group set functionality. This allows for different aggregation pathways, such as aggregation by "Partner" or facility type.

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 displays one column for all combinations of the items in the selected dimensions. When you place a data dimension on rows, the pivot table displays 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.

Constraints and tips

- You must select at least one dimension on columns or rows.
- You must include at least one period.
- Data element group sets and reporting rates can't appear in the same pivot table.

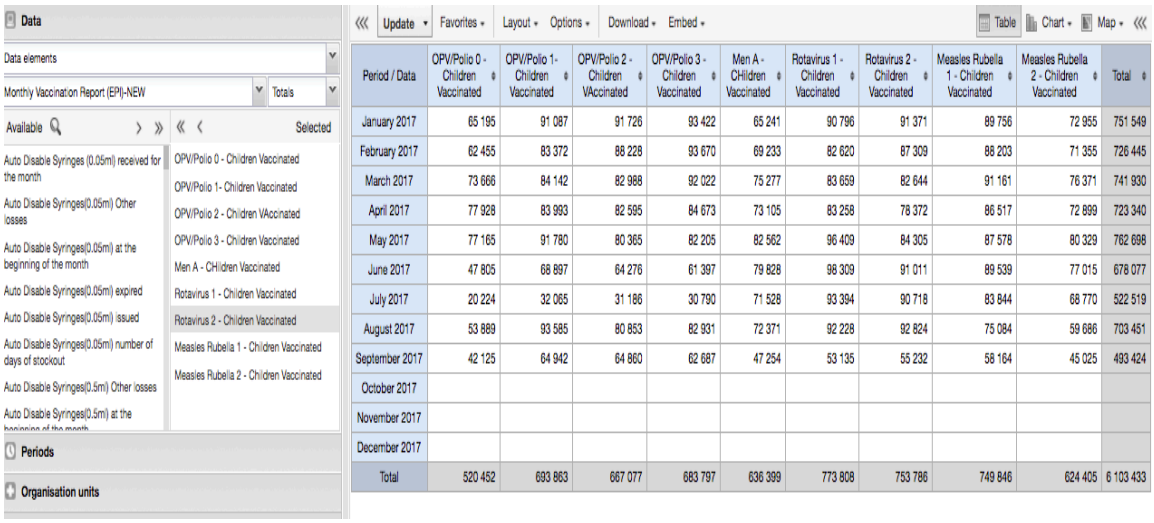
- A pivot table can't contain more than the maximum number of analytic records which have been specified in the system settings. The maximum number of records could also be constrained by the maximum RAM which is available to your browser. Consider making smaller tables instead of one table which displays all of your data elements and indicators together.
- The **Pivot Table** app supports drill-down and up for periods and organisation unit. This means that you can for example drill down from yearly periods to quarters, months and weeks inside a pivot table. You can also drill down from the global organisation unit to countries, provinces and facilities.

Create a pivot table

1. Open the **Pivot Table** app.
2. In the menu to the left, select the dimension items you want to analyse, for example data elements or indicators.
3. Click **Layout** and arrange the data dimensions as columns, rows and filters. You can keep the default selection if you want.
4. Click **Update**.

Example pivot table with data elements as columns and periods as rows.

Analyze data in pivot tables Select dimension items



Period / Data	OPV/Polio 0 - Children Vaccinated	OPV/Polio 1- Children Vaccinated	OPV/Polio 2 - Children VAccinated	OPV/Polio 3 - Children Vaccinated	Men A - CHildren Vaccinated	Rotavirus 1 - Children Vaccinated	Rotavirus 2 - Children Vaccinated	Measles Rubella 1 - Children Vaccinated	Measles Rubella 2 - Children Vaccinated	Total
January 2017	65 195	91 087	91 726	93 422	65 241	90 796	91 371	89 756	72 955	751 549
February 2017	62 455	83 372	88 228	93 670	69 233	82 620	87 309	88 203	71 355	726 445
March 2017	73 666	84 142	82 988	92 022	75 277	83 659	82 644	91 161	76 371	741 930
April 2017	77 928	83 993	82 595	84 673	73 105	83 258	78 372	86 517	72 899	723 340
May 2017	77 165	91 780	80 365	82 205	82 562	96 409	84 305	87 578	80 329	762 698
June 2017	47 805	68 897	64 276	61 397	79 828	98 309	91 011	89 539	77 015	678 077
July 2017	20 224	32 065	31 186	30 790	71 528	93 394	90 718	83 844	68 770	522 519
August 2017	53 889	93 585	80 853	82 931	72 371	92 228	92 824	75 084	59 686	703 451
September 2017	42 125	64 942	64 860	62 687	47 254	53 135	55 232	58 164	45 025	493 424
October 2017										
November 2017										
December 2017										
Total	520 452	693 863	667 077	683 797	636 399	773 808	753 786	749 846	624 405	6 103 433

Select dimension items

The left menu lists 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 is ignored.

You must choose at least one data dimension type to create a pivot table. The available types are described in this table:

Table 5.1. Data dimension types

Data dimension type	Definition	Examples
Indicators	An indicator is a calculated formula based on data elements.	Coverage of immunization across a specific district.
Data elements	Represents the phenomenon for which data has been captured.	Number of malaria cases; number of BCG doses given.

Data sets

A collection of data elements grouped for data collection. You can select :

Reporting rates for immunization and morbidity forms.

• **Reporting** percentage reports compared to the expected number of reports

- **Reporting rates on time**: the reporting rates based on timely form submissions. A timely submission must happen within a number of days after the reporting period.

- **Actual reports**: the actual number of reports

- **Actual reports on time**: the actual number of reports based on timely form submissions. A timely submission must happen

Data dimension type	Definition	Examples
	within a number of days after the reporting period. been assigned. **reports**: the of expected reports based on organisation units where the data set and the reporting frequency has • **Expected** number	

Event data items	A data element that is part of a program representing events that have been captured.	Average weight and height for children in a nutrition program.
Program indicators	A calculated formula based on data elements in a program representing events.	Average BMI score for children in a nutrition program.

You can combine these dimensions to display for example aggregate data with reporting rates, or event data items together with program indicators, all in the same pivot tables. For the "data element" data dimension, you are also able to select "Totals" and "Details", which will allow you to view different category combination options together on the same pivot table.

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 check-boxes 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 you can 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** key while clicking on organisation units. You can tick "User org unit", "User sub-units" or "User sub-x2-units" 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.

Selection of fixed and relative periods.

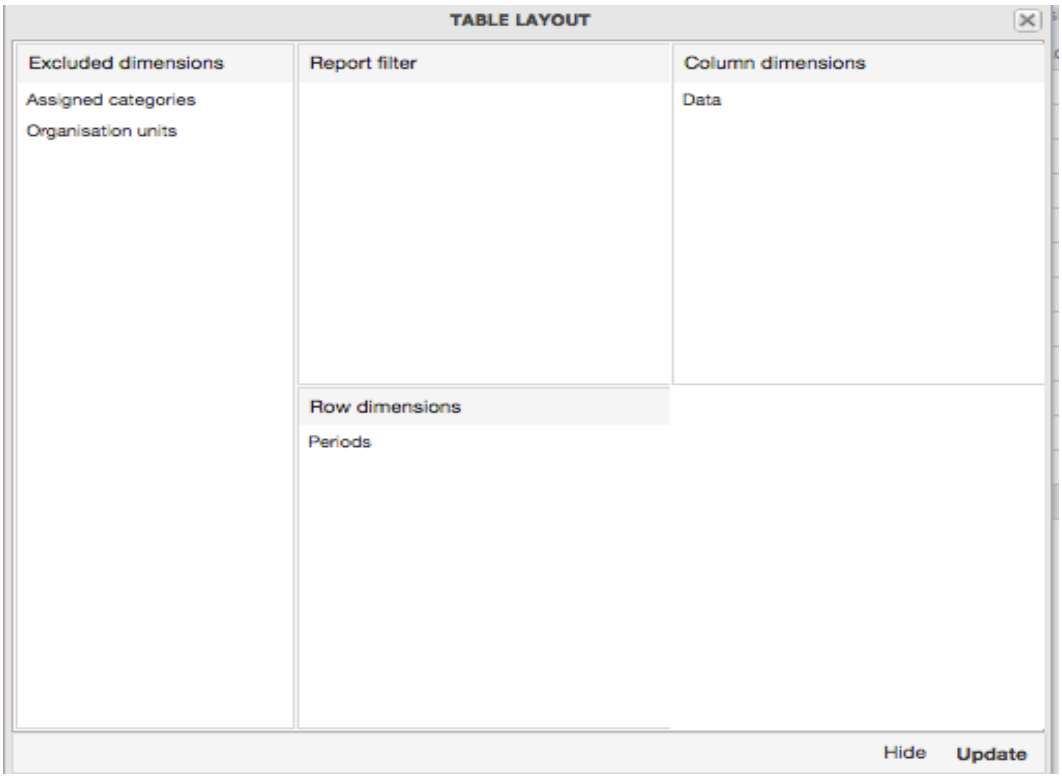
Dynamic dimensions can consist of organisation unit group sets, data element group sets, or category option group sets which have been configured with the type of "Disaggregation". Once the group sets have been configured, they will be come available in the pivot tables, and can be used as additional analysis dimensions, for instance to analyse aggregate data by Type of organisation unit or Implementing partner. Dynamic dimensions work the same as fixed dimensions.

Tip

Some dynamic dimensions may contain many items. This can cause issues with certain browsers due to the length of the URL when many dimension members are selected. A special "All" check box is available for dynamic dimensions, which allows you to include all available dimensions implicitly in your pivot table, without specifying each and every dimension member.

Modify pivot 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 "Organisation Unit" from the available dimensions list to the row dimension list in order to arrange them as rows in the pivot table.



The table layout screen.

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 organisation unit dimension as rows, the pivot table will generate all combinations of the items in these dimensions and produce a table like this:

Pivot table where organisation units and periods are repeated on rows.

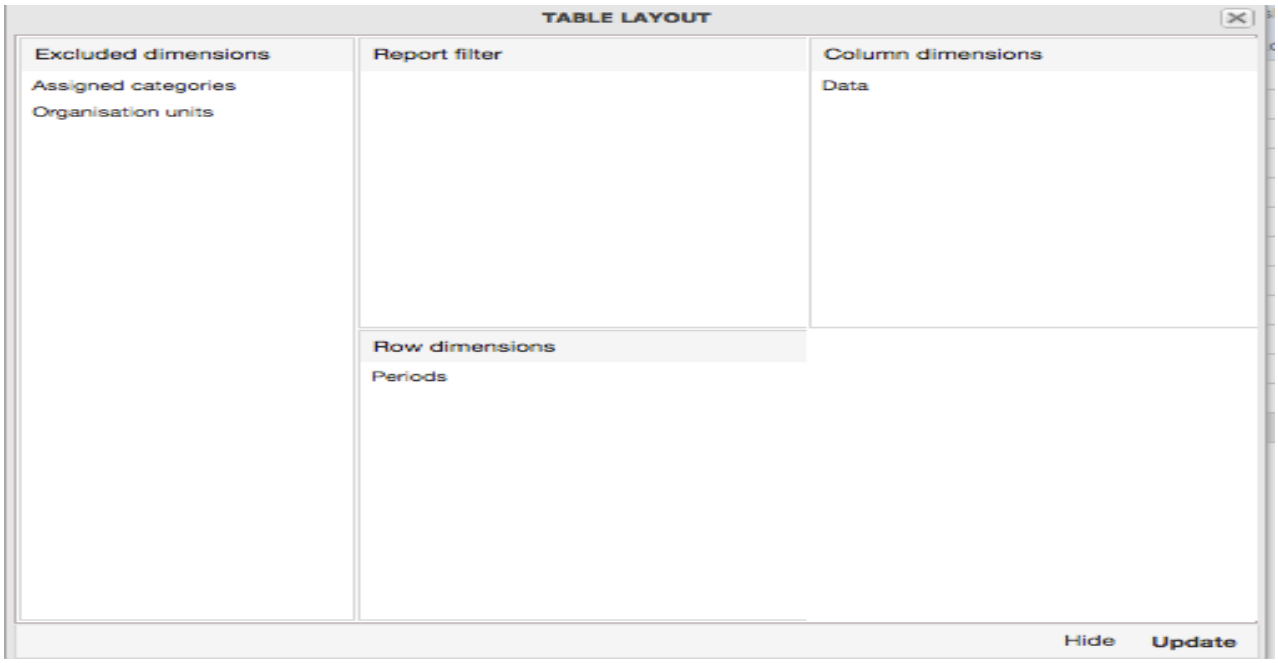
Change the display of your pivot table

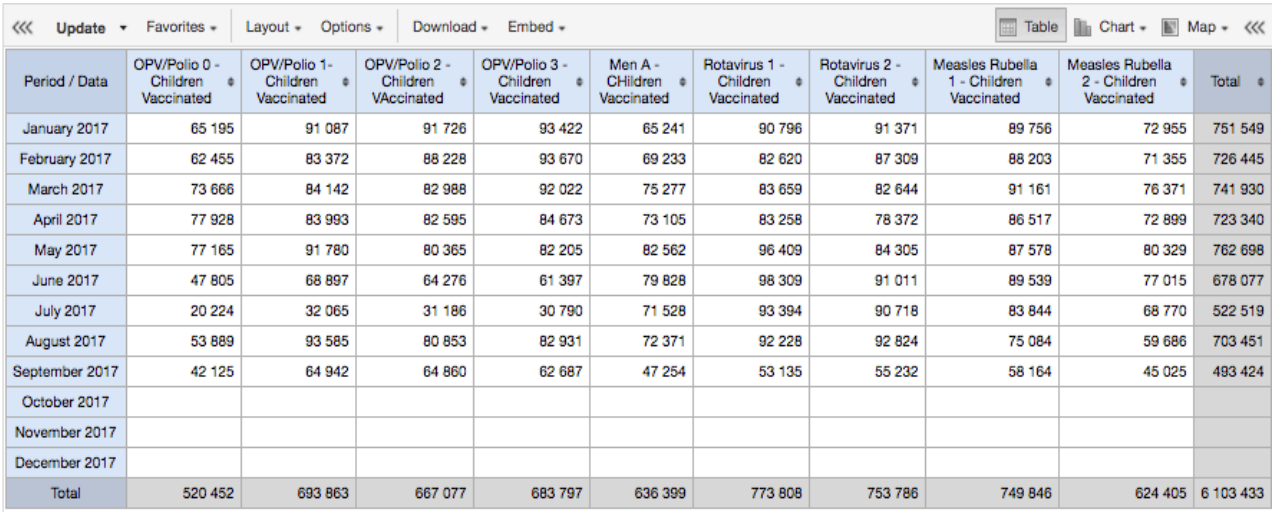
1. Open the **Pivot Table** app.

2. Create a new pivot table or open a favorite.

3. Click **Options**.

4. Click **Update**.





Period / Data	OPV/Polio 0 - Children Vaccinated	OPV/Polio 1- Children Vaccinated	OPV/Polio 2 - Children VAccinated	OPV/Polio 3 - Children Vaccinated	Men A - CHildren Vaccinated	Rotavirus 1 - Children Vaccinated	Rotavirus 2 - Children Vaccinated	Measles Rubella 1 - Children Vaccinated	Measles Rubella 2 - Children Vaccinated	Total
January 2017	65 195	91 087	91 726	93 422	65 241	90 796	91 371	89 756	72 955	751 549
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May 2017	77 165	91 780	80 365	82 205	82 562	96 409	84 305	87 578	80 329	762 698
June 2017	47 805	68 897	64 276	61 397	79 828	98 309	91 011	89 539	77 015	678 077
July 2017	20 224	32 065	31 186	30 790	71 528	93 394	90 718	83 844	68 770	522 519
August 2017	53 889	93 585	80 853	82 931	72 371	92 228	92 824	75 084	59 686	703 451
September 2017	42 125	64 942	64 860	62 687	47 254	53 135	55 232	58 164	45 025	493 424
October 2017										
November 2017										
December 2017										
Total	520 452	693 863	667 077	683 797	636 399	773 808	753 786	749 846	624 405	6 103 433

Table 5.2. Pivot table options

Change the display of your pivot table

Option		Description
Data	**Show column totals Show row totals**	Displays total values in the table for each row and column, as well as a total for all values in the table.
	Show column sub-totals Show row sub-totals	Displays subtotals in the table for each dimension. If you only select one dimension, subtotals will be hidden for those columns or rows. This is because the values will be equal to the subtotals.
	Show dimension labels	Shows the dimension names as part of the pivot tables.
	Hide empty rows	Hides empty rows from the table. This is useful when you look at large tables where a big part of the dimension items don't have data in order to keep the table more readable.
	Hide empty columns	Hides empty columns from the table. This is useful when you look at large tables where a big part of the dimension items don't have data in order to keep the table more readable.
	Skip rounding	Skips the rounding of data values, offering the full precision of data values. Can be useful for finance data where the full dollar amount is required.
	Aggregation type	The default aggregation operator can be over-ridden here, by selecting a different aggregation operator. Some of the aggregation types are **Count**, **Min** and **Max**.

Number type

Sets the type of value you want to display in the pivot table: **Value**, **Percentage of row** or **Percentage of column**.

The options **Percentage of row** and **Percentage of column** mean that you'll display values as percentages of row total or percentage of column total instead of the aggregated value. This is useful when you want to see the contribution of data elements,

Option		Description
		categories or organisation units to the total value.
Events	**Include only completed events**	Includes only completed events in the aggregation process. This is useful for example to exclude partial events in indicator calculations.
Organisation units	**Show hierarchy**	Shows the name of all ancestors for organisation units, for example "Ghana / Upper West / Sissala east / Sakai CHP" for Sakai CHP. The organisation units are then sorted alphabetically which will order the organisation units according to the hierarchy. When you download a pivot table with organisation units as rows and you've selected **Show hierarchy**, each organisation unit level is rendered as a separate column. This is useful for example when you create Excel pivot tables on a local computer.
Legend	**Apply legend**	Applies a legend to the values. This mean that you can apply a colour to the values. Select **By data item** to color the table cells individually according to each data element or indicator. You configure legends in the **Maintenance** app.
	Style	Colors the text or background of cells in pivot tables based on the selected legend. You can use this option for scorecards to identify high and low values at a glance.
Style	**Display density**	Controls the size of the cells in the table. You can set it to **Comfortable**, **Normal** or **Compact**. **Compact** is useful when you want to fit large tables into the browser screen.
	Font size	Controls the size of the table text font. You can set it to **Large**, **Normal** or

		Small.

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Analyze data in pivot tables Manage favorites

Option		**Description**
	Digit group separator	Controls which character to separate groups of digits or "thousands". You can set it to **Comma**, **Space** or **None**.
General	**Table title**	Type a title here to display it above the table.
Parameters (for standard reports only)	**Note** You create standard reports in the **Reports** app. In the **Pivot Table** app you set which parameters the system should prompt the user for.	
	Reporting period	Controls whether to ask user to enter a report period.
	Organisation unit	Controls whether to ask user to enter an organisation unit.
	Parent organisation unit	Controls whether to ask user to enter a parent organisation unit.
	Include regression	Includes a column with regression values to the pivot table.
	Include cumulative	Includes a column with cumulative values to the pivot table.
	Sort order	Controls the sort order of the values.
	Top limit	Controls the maximum number of rows to include in the pivot table.

Manage favorites

Saving your charts or pivot tables as favorites makes it easy to find them later. You can also choose to share them with other users as an interpretation or display them on the dashboard.

You view the details and interpretations of your favorites in the **Pivot Table**, **Data Visualizer**, **Event Visualizer**, **Event Reports** apps. Use the **Favorites** menu to manage your favorites.

Open a favorite

1. Click **Favorites** > **Open**.

2. Enter the name of a favorite in the search field, or click **Prev** and **Next** to display favorites.

3. Click the name of the favorite you want to open.

Save a favorite

1. Click **Favorites** > **Save as**.

2. Enter a **Name** and a **Description** for your favorite.

3. Click **Save**.

Rename a favorite

1. Click **Favorites** > **Rename**.

2. Enter the new name for your favorite.

3. Click **Update**.

Write an interpretation for a favorite

An interpretation is a link to a resource with a description of the data at a given period. This information is visible in the **Dashboard** app. To create an interpretation, you first need to create a favorite. If you've shared your favorite with other people, the interpretation you write is visible to those people.

1. Click **Favorites** > **Write interpretation**.
2. In the text field, type a comment, question or interpretation. You can see this information in the **Dashboard** app.

3. Search for a user group that you want to share your favorite with, then click the **+** icon.

4. Change sharing settings for the user groups you want to modify.

    a. **Can edit and view**: Everyone can view and edit the object.

b. **Can view only**: Everyone can view the object.

c. **None**: The public won't have access to the object. This setting is only applicable to **Public access**.

5. Click **Share**.

Create a link to a favorite

Click **Favorites** > **Get link**.

2. Select one of the following:

Open in this app: You get a URL for the favorite which you can share with other users by email or chat.

Open in web api: You get a URL of the API resource. By default this is an HTML resource, but you can change the file extension to ".json" or ".csv".

Delete a favorite

1. Click **Favorites** > **Delete**.

2. Click **OK**.

View interpretations based on relative periods

To view interpretations for relative periods, such as a year ago: 1. Open a favorite with interpretations.

2. Click **>>>** in the top right of the workspace.

3. Click an interpretation. Your chart displays the data and the date based on when the interpretation was created.

To view other interpretations, click them.

Download data from a pivot table

Download table layout data format

To download the data in the current pivot table:

Analyze data in pivot tables Download plain data source format

1. Click **Download**.

2. Under **Table layout**, click the format you want to download: Microsoft Excel, CSV or HTML. The data table will have one column per dimension and contain names of the dimension

items.

Tip

When you download a pivot table with organisation units as rows and you've selected **Show hierarchy** in **Table options**, each organisation unit level is rendered as a separate column. This is useful for example when you create Excel pivot tables on a local computer.

Tip

You can create a pivot table in Microsoft Excel from the downloaded Excel file.

Download plain data source format

You can download data in the current pivot table in JSON, XML, Excel, and CSV as plain data formats with different identification schemes (ID, Code, and Name). The data document uses identifiers of the dimension items and opens in a new browser window to display the URL of the request to the Web API in the address bar. This is useful for developers of apps and other client modules based on the DHIS2 Web API or for those who require a plan data source, for instance for import into statistical packages.

To download plain data source formats:

1. Click **Download**.

2. Under **Plain data source**, click the format you want to download.

Table 5.3. Available formats

Format	Action	Description
JSON	Click **JSON**	Downloads JSON format based on ID property. You can also download JSON format based on **Code** or **Name** property.
XML	Click **XML**	Downloads XML format based on ID

		property. You can also download XML format based on **Code** or **Name** property.
Microsoft Excel	Click **Microsoft Excel**	Downloads XML format based on ID property. You can also download Microsoft Excel format based on **Code** or **Name** property.
CSV	Click **CSV**	Downloads CSV format based on ID property. You can also download CSV format based on **Code** or **Name** property.

JRXML Put the cursor on **Advanced** Produces a template of a Jasper Report and click **JRXML** which can be further customized based on

Analyze data in pivot tables Download a CSV format without rendering data in the web browser

Format	Action	Description
		your exact needs and used as the basis for a standard report in DHIS2.
Raw data SQL	Put the cursor on **Advanced** and click **Raw data SQL**	Provides the actual SQL statement used to generate the pivot table. You can use it as a data source in a Jasper report, or as the basis for an SQL view.

Download a CSV format without rendering data in the web browser

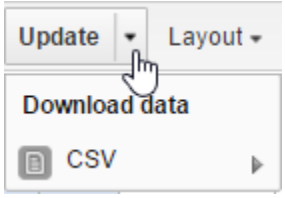
You can download data in CSV format directly without rendering the data in the web browser. This helps to reduce any constraints in the system settings that has been set with regards to the maximum number of analytic records. This lets you download much larger batches of data that you can use for later offline analysis.

To download data in CSV format without first rendering data in the web browser:

1. Click the arrow beside **Update**.

2. Click **CSV** to download the format based on ID property. The file downloads to your computer.

Tip You can also download CSV format based on **Code** or **Name** property.



Embed a pivot table in an external web page

Certain analysis-related resources in DHIS2, like pivot tables, charts and maps, can be embedded in any web page by using a plug-in. You will find more information about the plug- ins in the Web API chapter in the *DHIS2 Developer Manual*.

To generate a HTML fragment that you can use to display the pivot table in an external web page:

1. Click **Embed**.

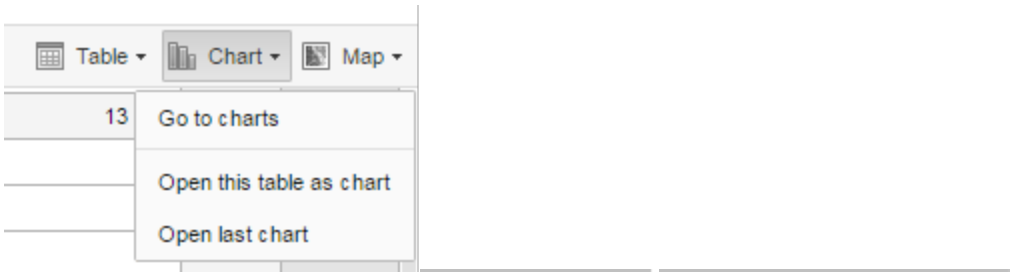
2. Click **Select** to highlight the HTML fragment.

Visualize pivot table data as a chart or a map

When you have made a pivot table you can switch between pivot table, chart and map visualization of your data.

Open a pivot table as a chart

1. Click **Chart** > **Open this table as chart**.
2. Your current pivot table opens as a chart.



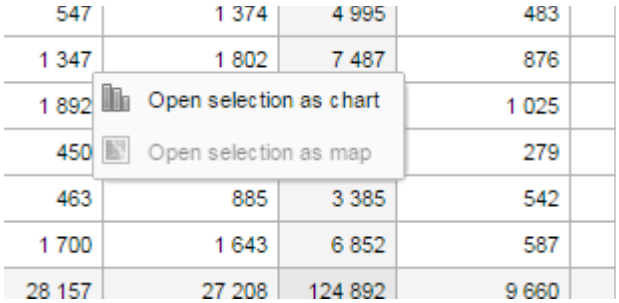
Open a pivot table selection as a chart

If you want to visualize a small part of your pivot table as a chart you can click directly on a value in the table instead opening the whole table.

1. In the pivot table, click a value.

2. To verify the selection, hold the cursor over **Open selection as chart**. The highlighted dimension headers in the table indicate what data will be visualized as a chart.

3. Click **Open selection as chart**.



Open a pivot table as a map

1. Click **Chart** > **Open this table as map** Your current pivot table opens as a map.

Open a pivot table selection as a map

1. In the pivot table, click a value. A menu displays.

2. Click **Open selection as map**. Your selection opens as a map.

Create Scorecards using the Pivot Table app

ANC 1 Coverage		ANC 2 Coverage		ANC 3 Coverage		ANC => 4 Coverage		ANC IPT 1 Coverage		ANC IPT 2 Coverage	
Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016
136.6	165.2	119.1	155	120.3	94.8	63.2	51.9	127.1	91.5	111.5	70.8
54.5	88.8	51.3	75.2	36.3	59	17.6	30.2	98.7	72.7	74.9	60.2
35.8	118	35.4	117.6	30.1	84.3	22.1	55.4	125.5	107.6	73.2	83.2
77.4	84.7	83.3	84.1	72.2	71.7	45.8	49.1	130.1	83	104.2	78.3
109.4	97.7	95.3	94.8	65.6	65.8	33.9	29.1	120.7	78.7	118.7	57.8
93.5	90	117	106.3	86.7	87.7	57.5	56	94.3	93.1	54.7	65.4
37.7	84.4	28.9	70	20.5	51.7	16.1	38.4	112.5	114.3	103.7	107.4
26.6	57.4	25.2	55.3	15.9	43.9	5.8	29.1	85	95.7	45.8	61.8
108	123.1	97.9	111.6	83.9	96.1	76.7	82	104.4	108	96.2	97.2
64.2	112.1	57.7	95.5	36.6	57.1	20.3	31.6	168.3	162.2	128	138.1
0.71	113.1	1.1	106.6	0.74	82	0.13	48.3	223.8	143.6	118.2	116.6
139.6	135	114.4	104.2	67.6	60.4	28.2	25	127.8	96.8	96.7	90
122.2	123.7	111.8	112.9	72.3	83.8	66.2	63.3	119.6	155.6	115.2	128.9

Scorecards definition: In public health settings such as Ministries of Health, scorecards offer a useful and standardized method for combining related indicators into one table. A scorecard gives an overall view of the performance of a health program such as a vaccination program, highlighting successes, weaknesses, and areas for improvement Here's what a typical scorecard looks like:

ANC 1 Coverage		ANC 2 Coverage		ANC 3 Coverage		ANC => 4 Coverage		ANC IPT 1 Coverage		ANC IPT 2 Coverage	
Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016
136.6	165.2	119.1	155	120.3	94.8	63.2	51.9	127.1	91.5	111.5	70.8
54.5	88.8	51.3	75.2	36.3	59	17.6	30.2	98.7	72.7	74.9	60.2
35.8	118	35.4	117.6	30.1	84.3	22.1	55.4	125.5	107.6	73.2	83.2
77.4	84.7	83.3	84.1	72.2	71.7	45.8	49.1	130.1	83	104.2	78.3
109.4	97.7	95.3	94.8	65.6	65.8	33.9	29.1	120.7	78.7	118.7	57.8
93.5	90	117	106.3	86.7	87.7	57.5	56	94.3	93.1	54.7	65.4
37.7	84.4	28.9	70	20.5	51.7	16.1	38.4	112.5	114.3	103.7	107.4
26.6	57.4	25.2	55.3	15.9	43.9	5.8	29.1	85	95.7	45.8	61.8
108	123.1	97.9	111.6	83.9	96.1	76.7	82	104.4	108	96.2	97.2
64.2	112.1	57.7	95.5	36.6	57.1	20.3	31.6	168.3	162.2	128	138.1
0.71	113.1	1.1	106.6	0.74	82	0.13	48.3	223.8	143.6	118.2	116.6
139.6	135	114.4	104.2	67.6	60.4	28.2	25	127.8	96.8	96.7	90
122.2	123.7	111.8	112.9	72.3	83.8	66.2	63.3	119.6	155.6	115.2	128.9

This tutorial explains how to create a scorecard in the DHIS2 Pivot Table app. There are several advantages to using the Pivot Table to create a scorecard, such as:

• You can save the scorecard on the dashboard and use it offline.

• You can share the scorecard with other DHIS2 users.

Let's get started!

Create a legend for your scorecard

First, we'll create a 3-color "traffic light" legend for the scorecard. With three basic colors, the scorecard is easy to scan and easy to understand.

1. Open the **Maintenance** app. Click the menu in the top right corner and select Maintenance from the list of apps. You can also type the first letters of the word maintenance in the search field to find the app.

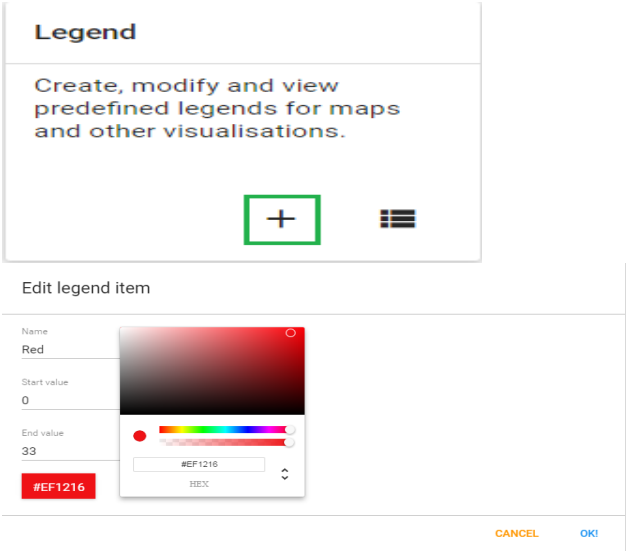
In the Maintenance app, scroll to the bottom of the page right down to the **Other** section.

3. Go to **Legend** and click the **+**.

4. In the **Legend Management** page, scroll to the bottom of the page and create a new legend by clicking the blue + button.

5. Enter a name for the legend such as "Traffic light", a start value and an end value in the fields. The values you enter here depend on the performance ratings you wish to set for the scorecard.

6. Change **Number of legend items** to 3 to display three colors in the scorecard. To change the legend item colors, click the blue + button and then edit the colors.



Create a scorecard in the Pivot Table app

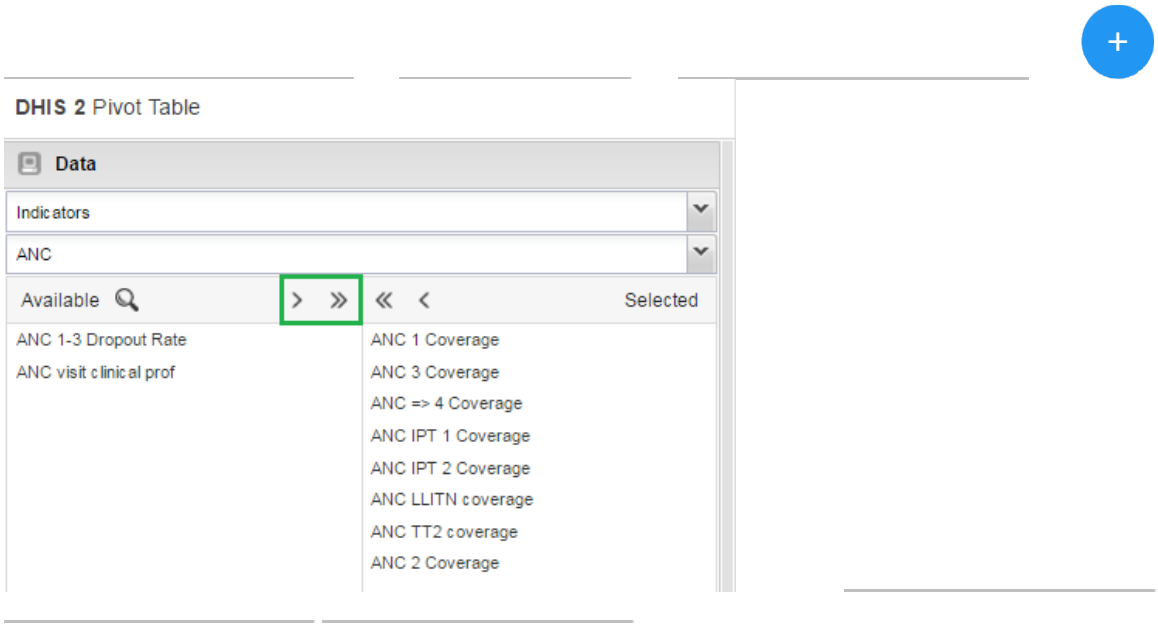
- Open the **Pivot Table** app from the top right menu of the dashboard. You can also enter the first letters of Pivot Table in the search field.

- Go to **Data** in the pane on the left side and select **Indicators** in the list.

- Select an **Indicator group** such as “EPI Indicators” in the second list.

- Using the arrows, select the type of indicators you want to see in your scorecard.

- Click **Update**. This button is in the menu at the top of the workspace



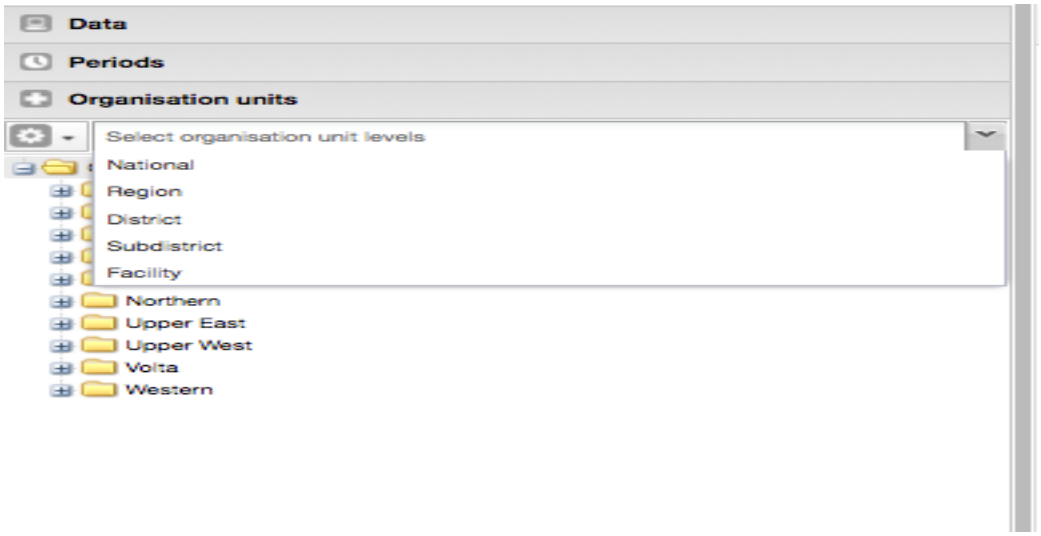
7. Go to **Periods** and select a period for which you want to display data. In this “traffic light” example, we’ll use the relative period section. In **Quarters**, select **This quarter** and **Last quarter**. Clear any other checkboxes and click **Update**.

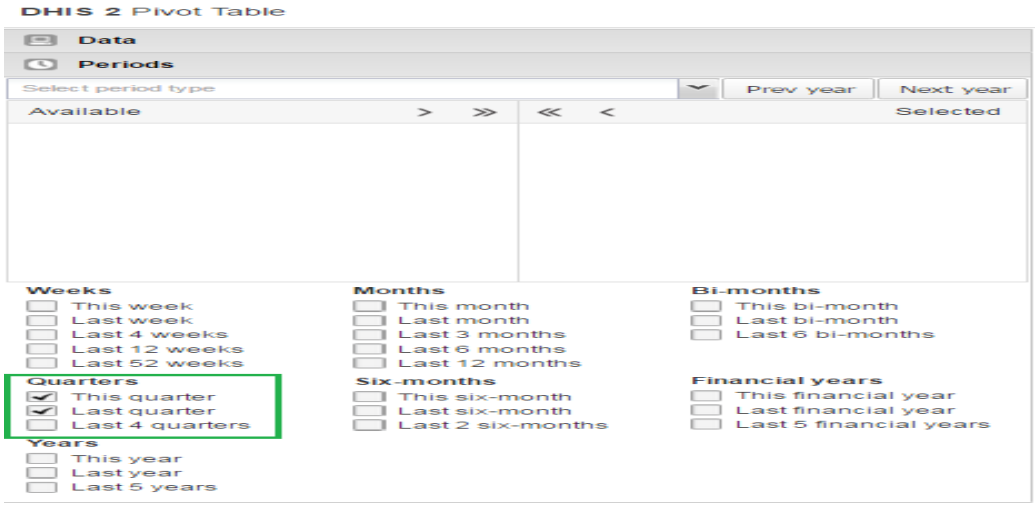
8. Go to **Organisation Units** in the same left side pane, and click the arrow next to the gear button.

9. Select **Select levels**.

10. Select **District** from the list (next to the gear button).

11. Click **Update**.





As you can see, the scorecard is starting to take shape in the workspace. Now it's time to fine-tune the look and feel.

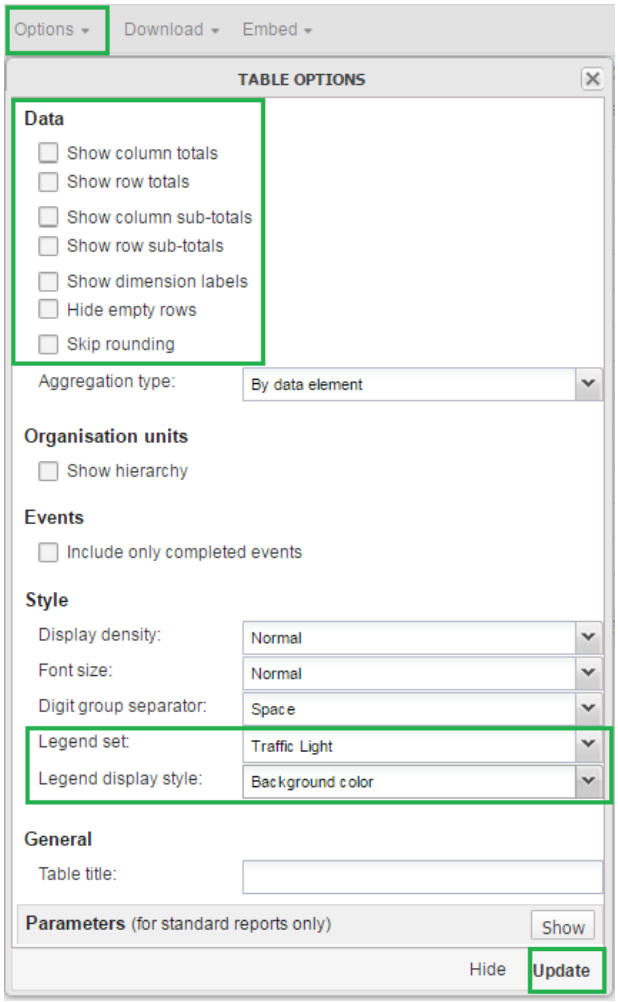
Organise the layout and display of your scorecard

1. In the workspace, click **Layout**.

2. In **Table layout**, drag **Organisation units** down to the **Row dimensions** section.

3. Drag **Data** to the **Column dimensions** section.

4. In the **Column dimensions** pane, drag **Periods** below **Data**, and click **Update**. 5. In the workspace, click **Options**.



6. Go to **Data** and clear all the checkboxes.

7.Go to **Style** > **Legend set** and from the list, select the legend you created in the

Maintenance app. In this example, we called it Traffic light.

8. Go to **Style** > **Legend display style** and select **Background color**.

9. Click **Update**.

The Scorecard is ready!

Save and share your scorecard

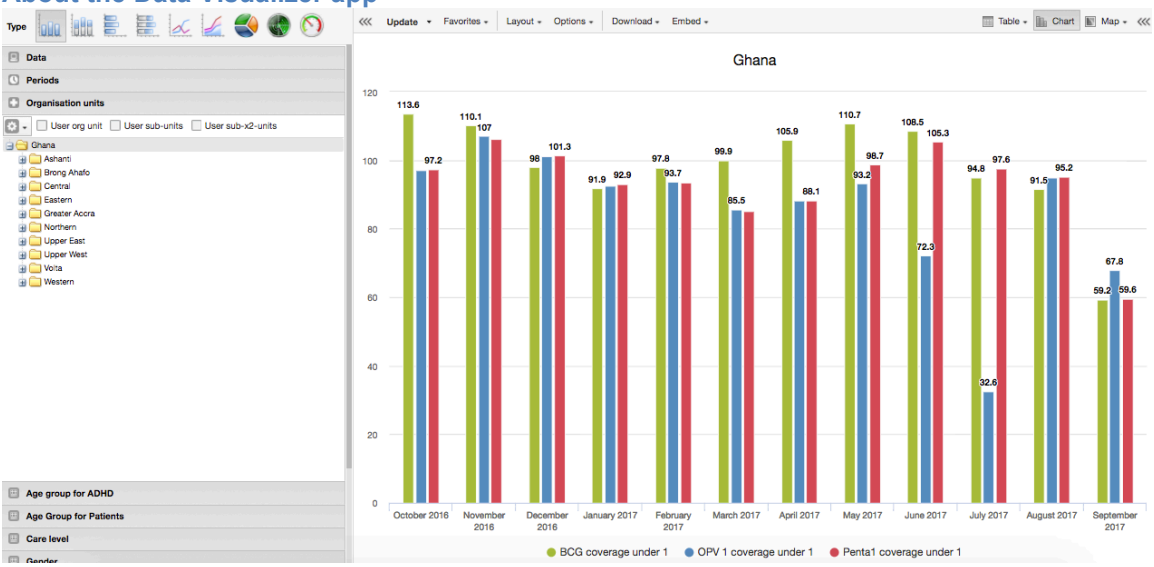
1. In the workspace, go to the **Favorites** menu.
2. Click **Save as**. Enter a name for your Scorecard.
3. To share your Scorecard, select **Favorites**.
4. Enter the name of a user group name, and click **Save**.

Your scorecard can be viewed by people that you share a dashboard with.

ANC 1 Coverage		ANC 2 Coverage		ANC 3 Coverage		ANC => 4 Coverage		ANC IPT 1 Coverage		ANC IPT 2 Coverage	
Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016	Oct to Dec 2016	Jul to Sep 2016
136.6	165.2	119.1	155	120.3	94.8	63.2	51.9	127.1	91.5	111.5	70.8
54.5	88.8	51.3	75.2	36.3	59	17.6	30.2	98.7	72.7	74.9	60.2
35.8	118	35.4	117.6	30.1	84.3	22.1	55.4	125.5	107.6	73.2	83.2
77.4	84.7	83.3	84.1	72.2	71.7	45.8	49.1	130.1	83	104.2	78.3
109.4	97.7	95.3	94.8	65.6	65.8	33.9	29.1	120.7	78.7	118.7	57.8
93.5	90	117	106.3	86.7	87.7	57.5	56	94.3	93.1	54.7	65.4
37.7	84.4	28.9	70	20.5	51.7	16.1	38.4	112.5	114.3	103.7	107.4
26.6	57.4	25.2	55.3	15.9	43.9	5.8	29.1	85	95.7	45.8	61.8
108	123.1	97.9	111.6	83.9	96.1	76.7	82	104.4	108	96.2	97.2
64.2	112.1	57.7	95.5	36.6	57.1	20.3	31.6	168.3	162.2	128	138.1
0.71	113.1	1.1	106.6	0.74	82	0.13	48.3	223.8	143.6	118.2	116.6
139.6	135	114.4	104.2	67.6	60.4	28.2	25	127.8	96.8	96.7	90
122.2	123.7	111.8	112.9	72.3	83.8	66.2	63.3	119.6	155.6	115.2	128.9

Using the Data Visualizer app

About the Data Visualizer app



With the **Data Visualizer** app, you can select content, for example indicators, data elements, periods and organisation units, for an analysis. The app works well over poor Internet connections and generates charts in the web browser.

Constraints and tips

1. 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.

2. Click the triple left-arrow button on the top centre menu. This collapses the left side menu and gives more space for the chart. You can get the menu back by clicking on the same button again.

Create a chart

1. Open the **Data Visualizer** app and select a chart type.

2. In the menu to the left, select the metadata you want to analyse. You must select 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 If you've access to the system settings, you can change the default period type under **General settings > Default relative period for analysis.**

Last 12 Months from the period dimension and the root organisation unit are selected by default.

3. Click **Layout** and arrange the dimensions. You can keep the default selection if you want.

4. Click **Update**.

Select a chart type

The **Data Visualizer** app has nine different chart types, each with different characteristics. To select a chart type:

In **Chart type**, click the chart type you need.

Table 6.1. Chart types

Chart type	Description
Column chart	Displays information as vertical rectangular columns with lengths proportional to the values they represent. Useful when you want to, for example, compare performance of different districts.
Stacked column chart	Displays information as vertical rectangular columns, where bars representing multiple categories are stacked on top of each other. Useful when you want to, for example, display trends or sums of related data elements.
Bar chart	Same as column chart, only with horizontal bars.
Stacked bar chart	Same as stacked column chart, only with horizontal bars.
Line chart	Displays information as a series of points connected by straight lines. Also referred to as time series. Useful when you want to, for example, visualize trends in indicator data over multiple time periods.
Area chart	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 when you want to compare the trends of related indicators.
Pie chart	Circular chart divided into sectors (or slices). Useful when you want to, for example, visualize the proportion of data for individual data elements compared to the total sum of all data elements in the chart.
Radar chart	Displays data on axes starting from the same point. Also known as spider chart.
Speedometer chart	Semi-circle chart which displays values out of 100 %. Also referred to as a gauge chart.

Select dimension items

A dimension refers to the elements which describe the data values in the system. There are three main dimensions in the system:

• Data: Includes data elements, indicators and datasets (reporting rates), describing the phenomena or event of the data.

• Periods: Describes when the event took place. • Organisation units: Describes where the event took place.

The Data Visualizer app lets you use these dimensions completely flexible in terms of appearing as series, categories and filter.

Note

You can select dimension items in different ways:

1. Double-click a dimension item name.

2. Highlight one or several dimension items and click the single-arrow.

3. To select all dimension items in a list, click the double-arrow.

4. To clear dimension items, use the arrows or double-click the names in the **Selected** list.

Select indicators

The Data Visualizer app can display any number of indicators and data elements in a chart. You can select both indicators and data elements to appear together in the same chart, with their order of appearance the same as the order in which they are selected.

1. Click **Data** and select **Indicators**.

2. Select an indicator group. The indicators in the selected group appear in the **Available** list.

3. Select one or several indicators by double-clicking the name. The indicator moves to the **Selected** list.

Select data elements

The Data Visualizer app can display any number of indicators and data elements in a chart. You can select both indicators and data elements to appear together in the same chart, with their order of appearance the same as the order in which they are selected.

1. Click **Data** and select **Data elements**.

2. Select a data element group. The data elements in the selected group appear in the **Available** list.

3. Select one or several data elements by double-clicking the name. The data element moves to the **Selected** list.

Select reporting rates

The Data Visualizer app can display reporting rates in a chart, by itself or together with indicators and data elements. Reporting rates are defined by data sets.

1. Click **Data** and select **Reporting rates**. The reporting rates appear in the **Available** list.

2. Select one or several reporting rates by double-clicking the name. The reporting rate moves to the **Selected** list.

Select fixed and relative periods

1. Click **Periods**.

2. Select one or several periods.

You can combine fixed periods and relative periods in the same chart. Overlapping periods are filtered so that they only appear once.

1. Fixed periods: In the **Select period type** box, select a period type. You can select any number of fixed periods from any period type.

2. Relative periods: In the lower part of the **Periods** section, select as many relative periods as you like. The names are relative to the current date. This means that if the current month is March and you select **Last month**, the month of February is included in the chart.

Select organisation units

- Click **Organisation units**.
- Click the gearbox icon.
- Select a **Selection mode** and an organisation unit. There are three different selection modes:
- Click **Update**.

Table 6.2. Selection modes

Selection mode	Description
Select organisation units	Lets you select the organisation units you want to appear in the chart from the organization tree. Select **User org unit** to disable the organisation unit tree and only select the organisation unit that is related to your profile. Select **User sub-units** to disable the organisation unit tree and only select the sub-units of the organisation unit that is related to your profile.

	Select **User sub-x2-units** to disable the organisation unit tree and only select organisation units two levels down from the organisation unit that is related to your profile. This functionality is useful for administrators to create a meaningful "system" favorite. With this option checked all users find their respective organisation unit when they open the favorite.
Select levels	Lets you select all organisation units at one or more levels, for example national or district level. You can also select the parent organisation unit in the tree, which makes it easy to select for example, all facilities inside one or more districts.
Select groups	Lets you select all organisation units inside one or several groups and parent organisation units at the same time, for example hospitals or chiefdoms.

Select additional dimension items

Depending on the settings for your organisation unit group sets and data element group sets, you can select additional dimension items from the left menu.

Here you can add dimension items such as age, sex, etc. without having to add them as detailed data element selections. This is useful when you want to separate these categories in your analysis.

The additional dimension items you select are available in **Chart layout** as dimensions.

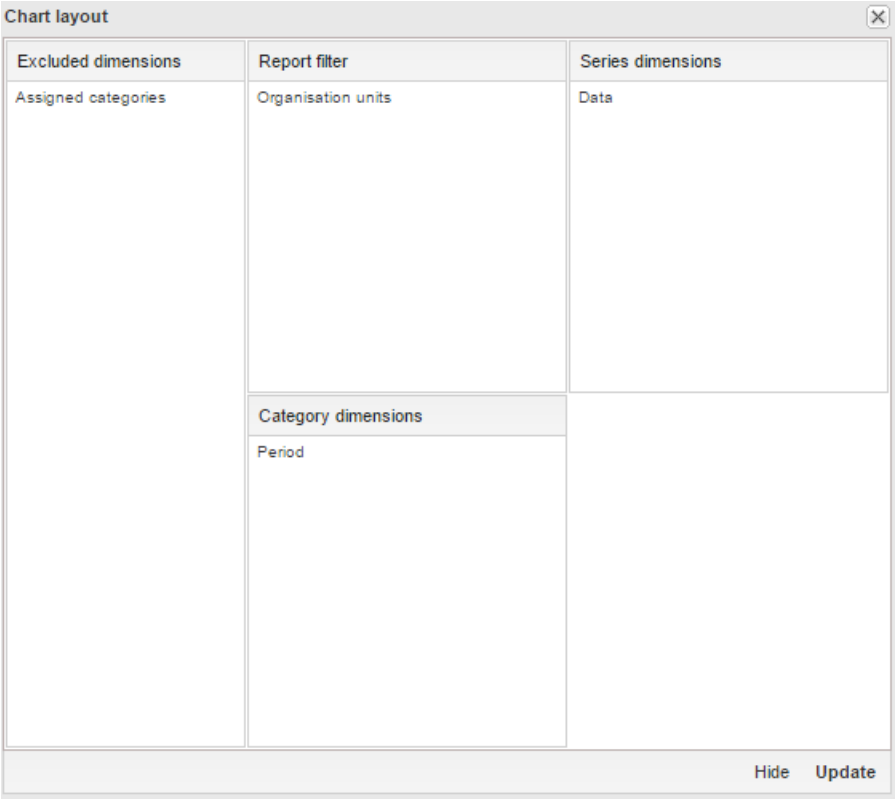
Select series, category and filter

You can define which dimension of the data you want to appear as series, category and filter.

1. Click **Layout**.

2. Drag and drop the dimensions to the appropriate space. Only one dimension can be in each section.

3. Click **Update**.



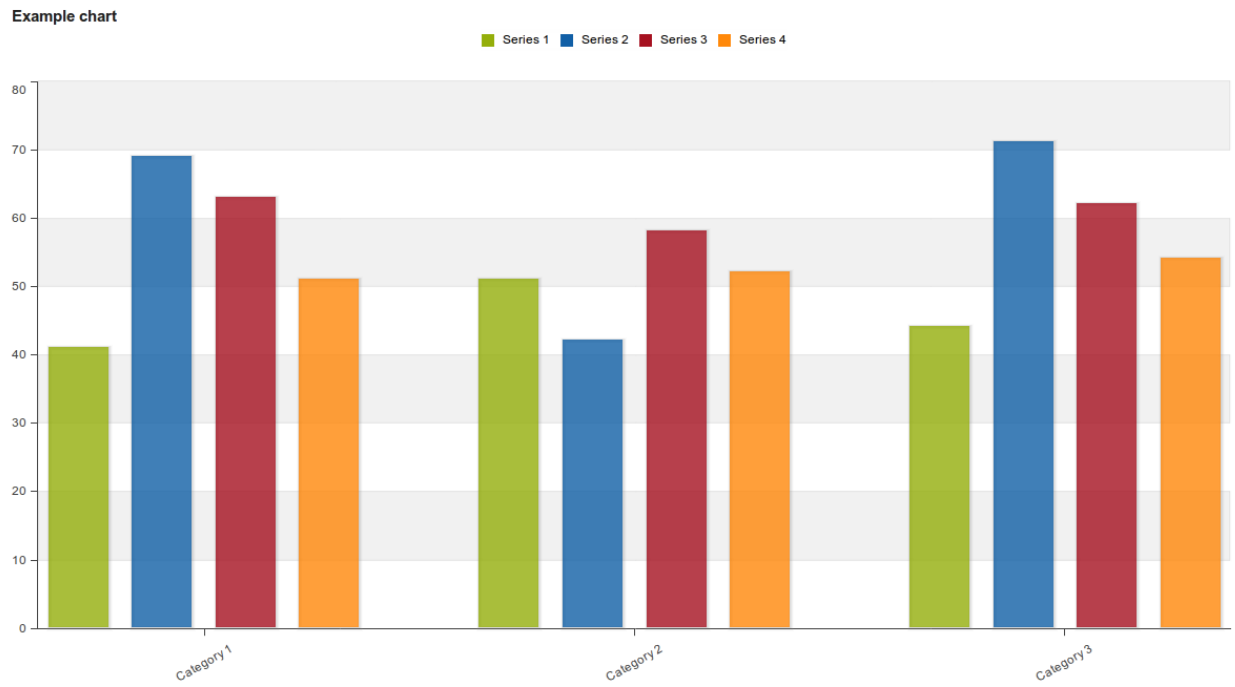
Example 6.1.

Chart illustrating the concepts of series, categories and filter

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

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

- Filter: The filter selection will filter the data displayed in the chart. Note that if you use the data dimension as filter, you can only specify a single indicator or data set as filter item, whereas with other dimension types you can select any number of items.



Change the display of your chart

1. Click **Options**.

2. Set the options as required.

3. Click **Update**.

Table 6.3. Chart options

Hide empty categories

Hides the category items with no data from the chart.

None: doesn't hide any of the empty categories

Before first: hides missing values only before the first value

Option		**Description**
Data	**Show values**	Shows the values above the series in the chart.
	Use 100% stacked values	Displays 100 % stacked values in column charts.
	Use cumulative values	Displays cumulative values in line charts.

Option		Description
		After last: hides missing values only after the last value **Before first and after last**: hides missing values only before the first value and after the last value **All**: hides all missing values This is useful for example when you create column and bar charts.
	Trend line	Displays the trend line which visualizes how your data evolves over time. For example if performance is improving or deteriorating. Useful when periods are selected as category.
	Target line value/title	Displays a horizontal line at the given domain value. Useful for example when you want to compare your performance to the current target.
	Base line value/title	Displays a horizontal line at the given domain value. Useful for example when you want to visualize how your performance has evolved since the beginning of a process.
	Sort order	Allows you to sort the values on your chart from either low to high or high to low.
	Aggregation type	Defines how the data elements or indicators will be aggregated within the chart. Some of the aggregation types are **By data element**, **Count**, **Min** and **Max**.
Events	**Include only completed events**	Includes only completed events in the aggregation process. This is useful when you want for example to exclude partial events in indicator calculations.
Axes	**Range axis min/max**	Defines the maximum and minimum value which will be visible on the range axis.
	Range axis tick steps	Defines the number of ticks which will be visible on the range axis.
	Range axis decimals	Defines the number of decimals which will be used for range axis values.

Range axis title Type a title here to display a label next to the range axis (also referred to as the

Y axis).

Option		Description
		want to give context information to the chart, for example about the unit of measure.
	Domain axis title	Type a title here to display a label below the domain axis (also referred to as the X axis). Useful when you want to give context information to the chart, for example about the period type.
General	**Hide chart legend**	Hides the legend and leaves more room for the chart itself.
	Hide chart title	Hides the title (default or custom) of your chart.
	Chart title	Type a title here to display a custom title above the chart. If you don't enter a title, the default title is displayed.
	Hide chart subtitle	Hides the subtitle of your chart.
	Chart subtitle	Type a subtitle here to display a custom subtitle above the chart but below the title. If you don't enter a subtitle, no subtitle is displayed in the chart.

Manage favorites

Saving your charts or pivot tables as favorites makes it easy to find them later. You can also choose to share them with other users as an interpretation or display them on the dashboard.

You view the details and interpretations of your favorites in the **Pivot Table**, **Data Visualizer**, **Event Visualizer**, **Event Reports** apps. Use the **Favorites** menu to manage your favorites.

Open a favorite

1. Click **Favorites** > **Open**.

2. Enter the name of a favorite in the search field, or click **Prev** and **Next** to display favorites.

3. Click the name of the favorite you want to open.

Save a favorite

1. Click **Favorites** > **Save as**.

2. Enter a **Name** and a **Description** for your favorite.

3. Click **Save**.

Rename a favorite

1. Click **Favorites** > **Rename**.

2. Enter the new name for your favorite.

3. Click **Update**.

Write an interpretation for a favorite

An interpretation is a link to a resource with a description of the data at a given period. This information is visible in the **Dashboard** app. To create an interpretation, you first need to create a favorite. If you've shared your favorite with other people, the interpretation you write is visible to those people.

- Click **Favorites** > **Write interpretation**.
- In the text field, type a comment, question or interpretation. You can see this information in the **Dashboard** app.
- Search for a user group that you want to share your favorite with, then click the **+** icon.
- Change sharing settings for the user groups you want to modify.
    - **Can edit and view**: Everyone can view and edit the object.
    - **Can view only**: Everyone can view the object.
    - **None**: The public won't have access to the object. This setting is only applicable to **Public access**.
- Click **Share**.

Create a link to a favorite

1. Click **Favorites** > **Get link**.

2. Select one of the following:

• **Open in this app**: You get a URL for the favorite which you can share with other users by email or chat.

• **Open in web api**: You get a URL of the API resource. By default this is an HTML resource, but you can change the file extension to ".json" or ".csv".

Delete a favorite

1. Click **Favorites** > **Delete**.

2. Click **OK**.

View interpretations based on relative periods

To view interpretations for relative periods, such as a year ago:

1. Open a favorite with interpretations.

2. Click **>>>** in the top right of the workspace.

3. Click an interpretation. Your chart displays the data and the date based on when the interpretation was created. To view other interpretations, click them.

Download a chart as an image or a PDF

After you have created a chart you can download it to your local computer as an image or PDF file.

1. Click **Download**.

2. Under **Graphics**, click **Image (.png)** or **PDF (.pdf)**.

The file is automatically downloaded to your computer. Now you can for example embed the image file into a text document as part of a report.

Download chart data source

You can download the data source behind a chart in JSON, XML, Excel, CSV, JXRML or Raw data SQL formats with different identification schemes (ID, Code, and Name). The data document uses identifiers of the dimension items and opens in a new browser window to display the URL of the request to the Web API in the address bar. This is useful for developers of apps and other client modules based on the DHIS2 Web API or for those who require a plan data source, for instance for import into statistical packages.

To download plain data source formats: 1. Click **Download**.

2. Under **Plain data source**, click the format you want to download.

Table 6.4. Available formats

Format	Action	Description
JSON	Click **JSON**	Downloads JSON format based on ID property. You can also download JSON format based on **Code** or **Name** property.
XML	Click **XML**	Downloads XML format based on ID property. You can also download XML format based

		on **Code** or **Name** property.
Microsoft Excel	Click **Microsoft Excel**	Downloads Microsoft Excel format based on ID property. You can also download Microsoft Excel format based on **Code** or **Name** property.
CSV	Click **CSV**	Downloads CSV format based on ID property. You can also download CSV format based on **Code** or **Name** property.
JRXML	Put the cursor on **Advanced** and click **JRXML**	Produces a template of a Jasper Report which can be further customized based on your exact needs and used as the basis for a standard report in DHIS 2.
Raw data SQL	Put the cursor on **Advanced** and click **Raw data SQL**	Provides the actual SQL statement used to generate the data visualization. You can use it as a data source in a Jasper report, or as the basis for a SQL view.

Embed charts in any web page

Certain analysis-related resources in DHIS2, like pivot tables, charts and maps, can be embedded in any web page by using a plug-in. You will find more information about the plug- ins in the Web API chapter in the *DHIS2 Developer Manual*.

To generate a HTML fragment that you can use to display the chart in an external web page: 1. Click **Share** > **Embed in web page**.

Using the Data Visualizer app The **Embed in web page** window opens.

2. Click **Select** to highlight the HTML fragment.

Open a chart as a pivot table or as a map

• Open a **Chart** and click **Chart** or click **Map**.

Open a chart as a pivot table or as a map

Using the GIS app

About the GIS app

With the GIS app you can overlay multiple layers and choose among different base maps. You can create thematic maps of areas and points, view facilities based on classifications, and visualize catchment areas for each facility. You can add labels to areas and points, and search and filter using various criteria. You can move points and set locations on the fly. Maps can be saved as favorites and shared with other people.

Note To use predefined legends in the **GIS** app, you need to create them first in the

Maintenance app. **Here's an overview of the GIS app workspace**

1. The icons in the top left of the workspace represent the map layers. They are the starting point of the **GIS** app.

2.The panel on the right side of the workspace shows an overview of the layers:

a. The default base map is OSM Light. It's selected by default. If you're online you'll also see **OpenStreetMap**, Google Streets and Google Hybrid. You can use these maps as background maps and layers. Switch between them by selecting or clearing the checkbox.

b. If you want to increase or reduce the opacity of a layer, use the up and down arrows for the selected layer.

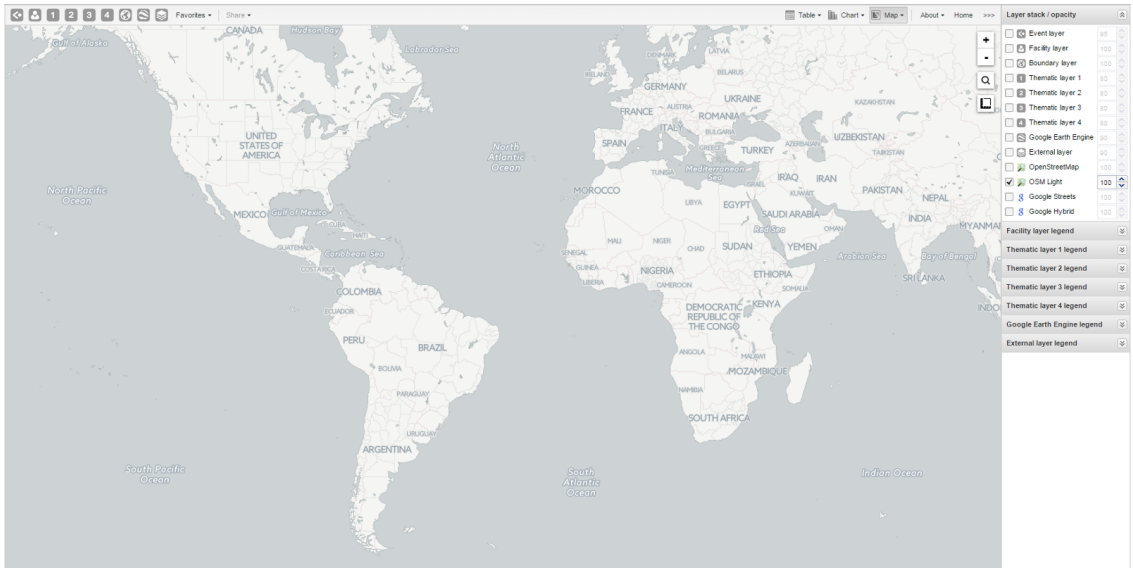
c. Use the map legends when you create a thematic map. A legend explains the link between values and colors on your map.

2. **Zoom to content** automatically adjusts the zoom level and map center position to put the data on your map in focus.

3. To view information for an event, simply click the event.

4. Right-click to display the longitude and latitude of the map.

Create a new thematic map



You use four vector layers to create a thematic map. The workflow for creating a new thematic map is:

Using the GIS app Manage event layers

1. In the **Apps** menu, click **GIS**. The **DHIS2 GIS** window opens.

2. In the top menu, click a layer you want to add to the map.

- Event layer
- Facility layer
- Boundary layer
- Thematic layer 1 - 4

3. Click **Edit layer** and select the parameters you need..

4. Click **Update**.

Manage event layers

The event layer displays the geographical location of events registered in the DHIS2 tracker. Provided that events have associated GPS coordinates, you can use this layer to drill down from the aggregated data displayed in the thematic layers to the underlying individual events or cases.

You can also display aggregated events at the facility or at the boundary level. You do this through a thematic layer using event data items. This is useful when you only have the coordinates for the Org Unit under which the events are recorded.

Event layer

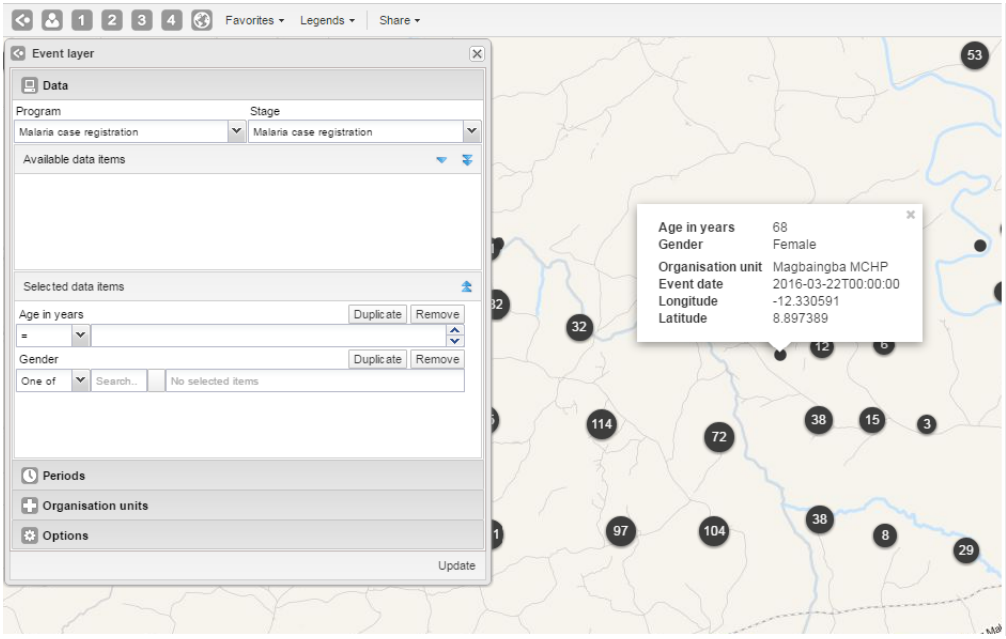
Create or modify event layer

- In the top menu, click the event layer icon.

- Click **Edit layer**.

- Select a program and then select a program stage. If there is only one stage available for the selected program, the stage is automatically selected. A list of data elements and attributes will appear in the **Available data items** panel.

- Select any data element or attribute from this list as part of your query.



• To select you can either double-click a data element or (multi) select and use the single- arrow downward button. The double-arrow button will select all data elements in the list. All selected data elements will get their own row in the **Selected data items**.

• For data elements of type text you will get two choices: **Contains** implies that the query will match all values which contains your search value, and **Is exact** implies that only values which is completely identical to your search query will be returned.

• For data elements of type option set, you can select any of the options from the drop down box by using the down-wards arrow or by start typing directly in the box to filter for options.

5. In the **Periods** section, select the time span for when the events took place. You can select either a fixed period or a relative period.

   a. Fixed period: In the **Period** field, select **Start/end dates** and fill in a start date and an end date.

b. Relative period: In the **Period** field, select one of the relative periods, for example **This month** or **Last year**.

6. In the **Organisation units** section, select the organisation units you want to include in the query.

7. In the **Options** section, you can:

a. Select a value from the **Coordinate field** for the positions shown on the map. By default, "Event location" is selected. Depending on the data elements or attributes that belong to a program, other coordinates such as "Household position" are available.

b. Select or clear **Clustering** to group nearby events.

c. Go to **Style** to select a color for the cluster points or change the radius of clusters (between 1 and 20). **Clustering** if you want to group nearby events and change the style of the cluster points. 8. Click **Update**.

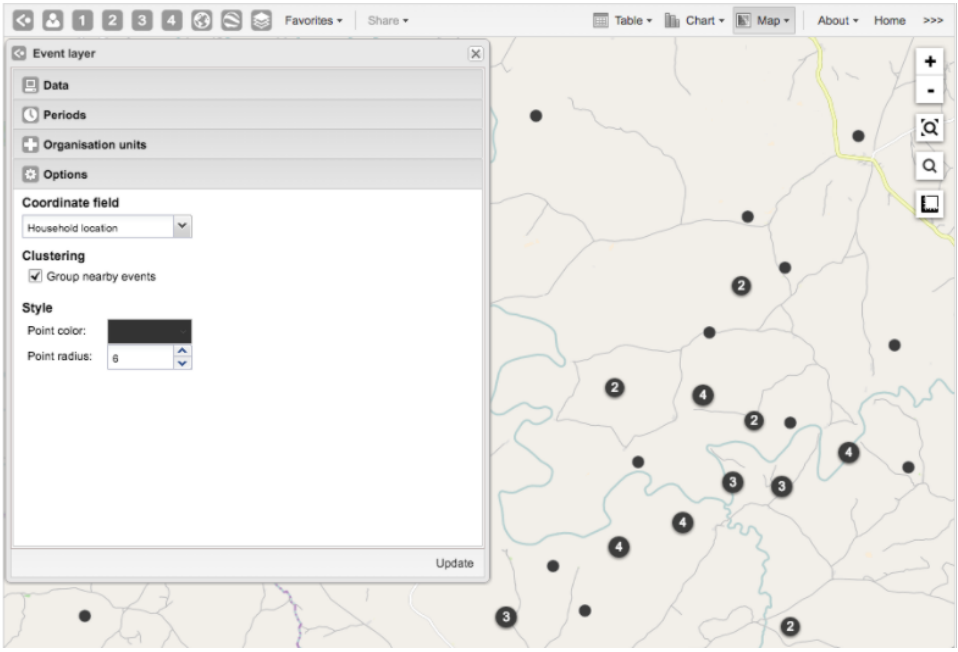
Turn off cluster

By default events are clustered in a map. You can turn off this function to display all events separately.

1. In the top menu, click the event layer icon.

2. Click **Edit layer**.

3. Click **Options**.



Using the GIS app

4. Clear **Group nearby events** check box.

5. Click **Update**.

Modify cluster style

1. In the top menu, click the event layer icon.

2. Click **Edit layer**.

3. In the **Options** section, change the **Point color** and **Point radius**.

4. Click **Update**.

Modify information in event pop-up windows

Modify cluster style

For events in a cluster map, you can modify the information displayed in the event pop-up window.

Pop-up window with event information

1. Open the **Programs / Attributes** app.

2. Click **Program**.

3. Click the program you want to modify and select **View program stages**.

4. Click the program stage name and select **Edit**.

5. Scroll down to the **Selected data elements** section.

6. For every data element you want to display in the pop-up window, select corresponding **Display in reports**.

7. Click **Update**.

Clear event layer

To clear all data in a map:

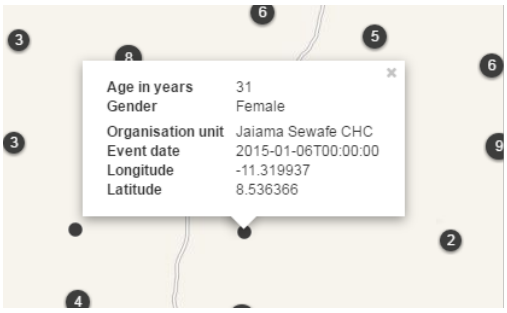
1. In the top menu, click the event layer icon.

2. Click **Clear**.

Manage facility layers

The facility layer displays icons that represent types of facilities. Polygons do not show up on the map, so make sure that you select an organisation unit level that has facilities.

A polygon is an enclosed area on a map representing a country, a district or a park. In GIS, a polygon is a shape defined by one or more rings, where a ring is a path that starts and ends at the same point.



Facility layer

Create or modify a facility layer

1. In the top menu, click the facility layer icon.

2. Click **Edit layer**.

3. In the **Organisation unit group icons** section, select a **Group set**.

4. In the **Organisation units** section, select one or several organisation units.

5. In the **Options** section, select if you want to show labels and if so, how they look.

6. In the **Options** section, select if you want to display a circle with a certain radius around each facility.

7. Click **Update**.

Search for an organisation unit

To locate an organisation unit in the map:

1. In the top menu, click the facility layer icon.
2. Click **Search**. The **Organisation unit search** dialog box opens.
3. In the text field, type the name of the organisation unit you are looking for or click a name in the list. The organisation unit is highlighted in the map.

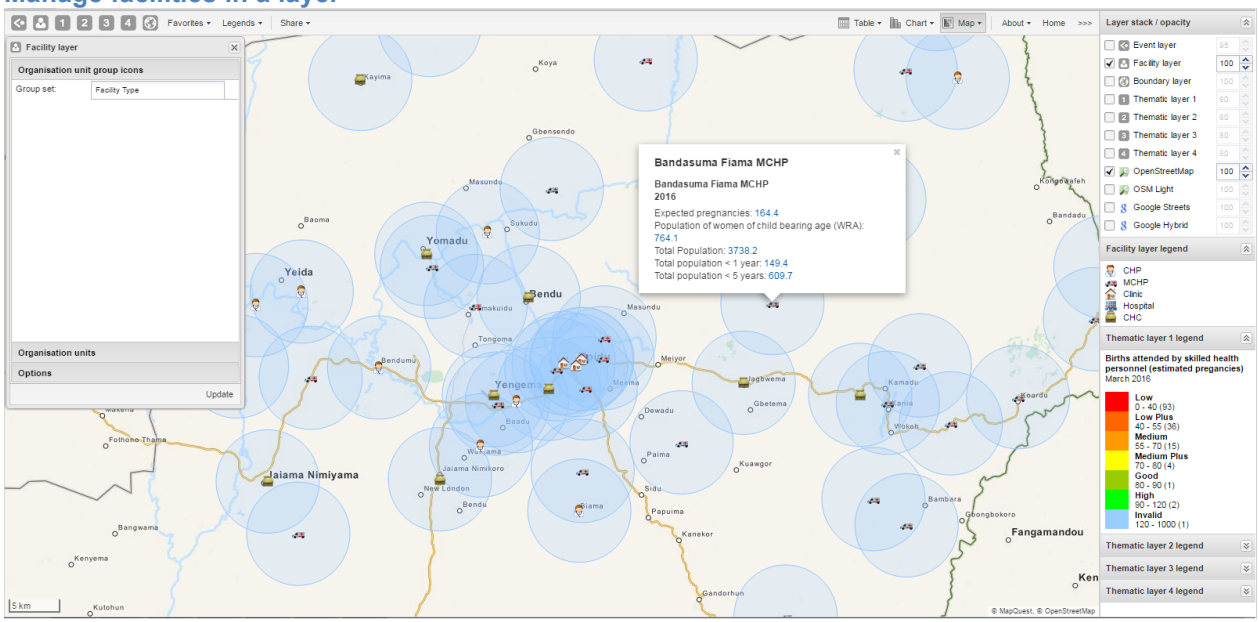
Clear facility layer

To clear all data in a facility layer:

1. In the top menu, click the facility layer icon.

2. Click **Clear**.

Manage facilities in a layer



You can have facilities in **Facility**, **Boundary** and **Thematic** layers.

Relocate a facility

1. Right-click a facility and click **Relocate**.

2. Put the cursor in the new location.

The new coordinate is stored permanently. This cannot be undone.

Swap longitude and latitude of a facility

1. Right-click a facility and click **Swap long/lat**. This is useful if a user inverted latitude and longitude coordinates when creating the organisation unit.

Display facility information

You can view organisation unit information set by the administrator as follows:

Table 7.1. View organisation unit information

Function	Action
View information for the current period	1. Click a facility.
View information for a selected period	1. Right-click a facility and click **Show information**. 2.In

	the **Infrastructural data** section, select a period. **Note** You configure the displayed infrastructural data in the **System Settings** app.

Manage thematic layers 1- 4

There are four thematic layers in the GIS app. With these layers panels you can use your data for thematic mapping. Select your desired combination of indicator/data element, and period. then the organisation unit level. If your database has coordinates and aggregated data values for these organisation units, they will appear on the map.

Note

You must refresh the DHIS2 analytics tables to have aggregated data values available.

Create or modify a thematic layer

1. In the top menu, click the icon of the thematic layer you want to create or modify.
2. Click **Edit layer**.

3. In the **Data and periods** section, select the data and periods you want to display.

4. In the **Organisation units** section, select one or several organisation units.

5. In the **Options** section, go to **Legend type** and select Automatic or Predefined.

    a. Automatic legend types 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 counts the legend creator will try to distribute the organisation units evenly. The legend appears as an even gradation from the start color to the end color.

    b. If you have facilities in your thematic layer, you can set the radius for maximum and minimum values by changing the values in the **Low color / size** and **High color size** boxes.

6. In the **Options** section, select if you want to show labels and if so, how they look.

7. In the Options panel, select an aggregation type.

8. Click **Update**.

Filter values in a thematic layer

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

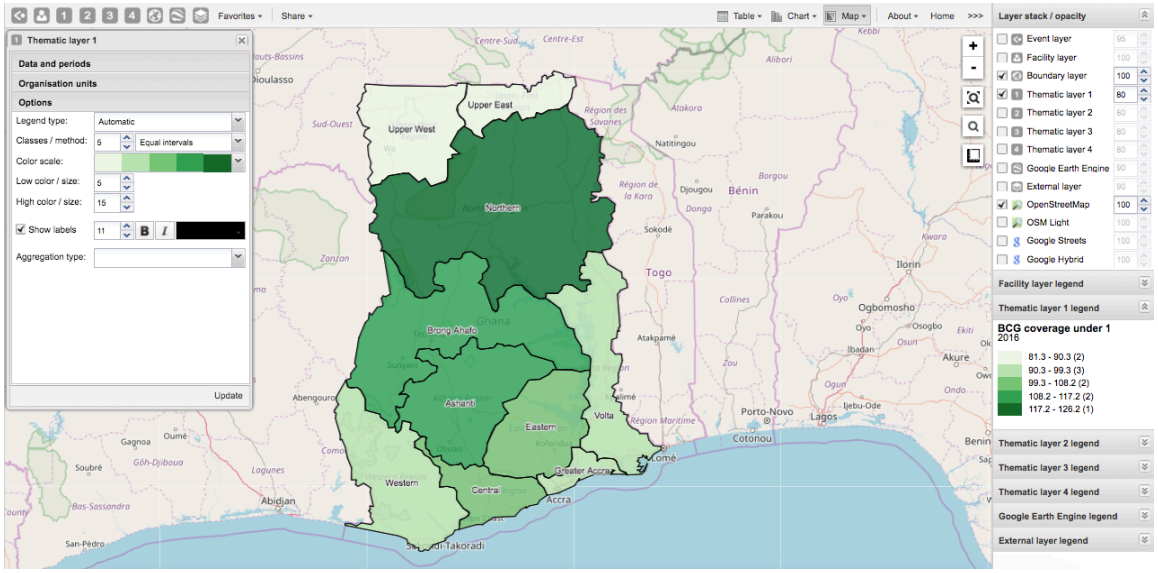
close the filter window.

To filter values in a thematic layer:

1. In the top menu, click the icon of thematic layer you want to create or modify. 2. Click **Filter**

3. Modify the **Greater than** and **And/or lower than** values.

4. Click **Update**.



Search for an organisation unit

To locate an organisation unit in a thematic layer:

1. In the top menu, click the relevant thematic layer icon.
2. Click **Search**.

Search for an organisation unit

The **Organisation unit search** dialog box opens.

3. In the text field, type the name of the organisation unit you are looking for or click a name in the list. The organisation unit is highlighted in the map.

Navigate between organisation hierarchies

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.

1. Right-click one of the organisation units.

2. Select **Drill up** or **Drill down**.

The drill down option is disabled if you are on the lowest level or if there are no coordinates available on the level below. Vice versa goes for drilling up.

Clear thematic layer

To clear all data in a thematic layer:

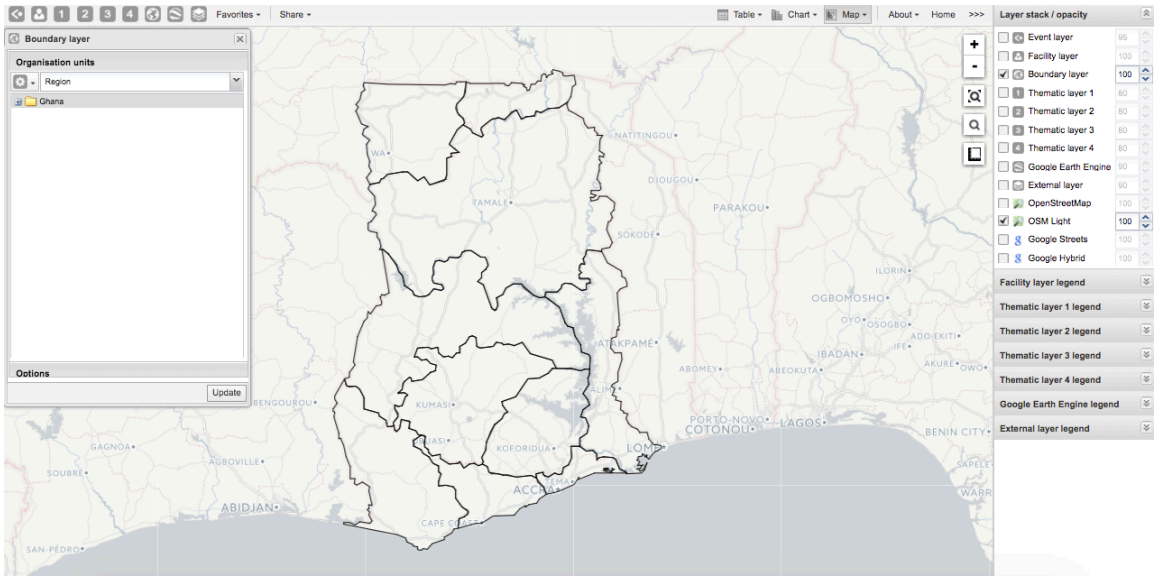
1. In the top menu, click the relevant thematic layer icon.

2. Click **Clear**.

Manage boundary layers

The boundary layer displays the borders and locations of your organisation units. This layer is useful if you are offline and don't have access to background maps.

Boundary layer



Create or modify boundary layers

1. In the top left menu, click the boundary layer icon.
2. Click **Edit layer**.

3. In the **Organisation units** section, select one or several organisation units. 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".

4. In the **Options** section, select if you want to show labels and if so, how they look.

5. Click **Update**.

Search for organisation units

To locate an organisation unit on the map:

1. In the top menu, click the boundary layer icon.
2. Click **Search**. The **Organisation unit search** dialog box opens.

3. In the text field, type the name of the organisation unit you are looking for or click a name in the list. The organisation unit is highlighted in the map.

Navigate between organisation hierarchies

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.

1. Right-click one of the organisation units.

2. Select **Drill up** or **Drill down**.

The drill down option is disabled if you are on the lowest level or if there are no coordinates available on the level below. The same applies when you are drilling up.

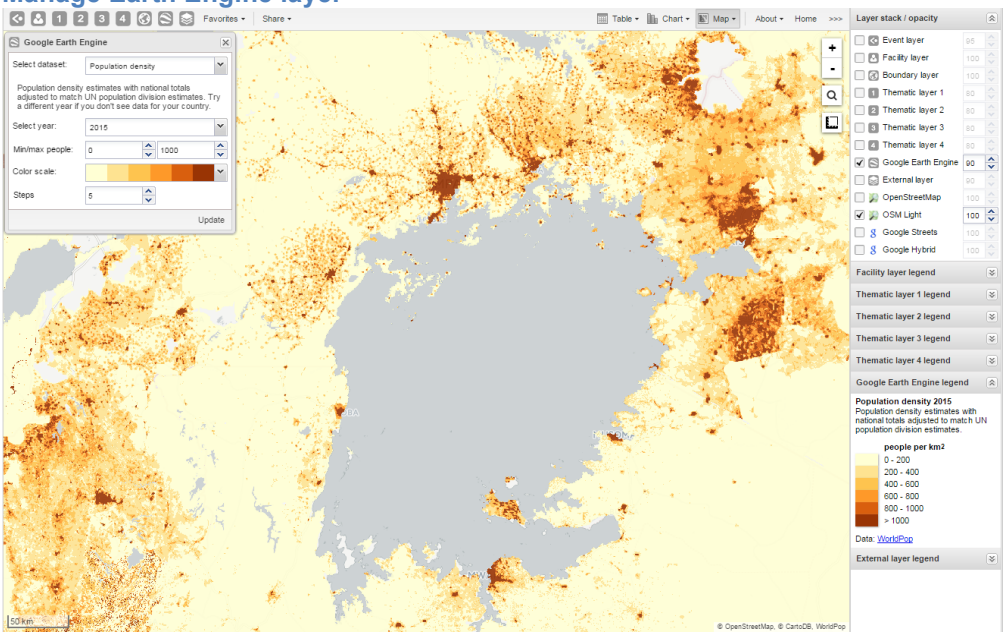
Clear boundary layer

To clear data in a boundary layer:

1. In the top menu, click the boundary layer icon.

2. Click **Clear**.

Manage Earth Engine layer



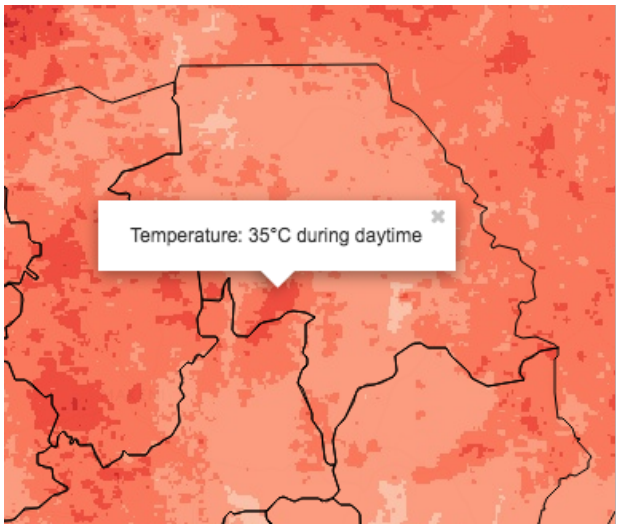
The Google Earth Engine layer lets you display satellite imagery and geospatial datasets from Google's vast catalog. This layer is useful in combination with thematic and event layers to enhance analysis. The following layers are supported:

1. Elevation: Metres above sea level

2. Nighttime lights: Lights from cities, towns, and other sites with persistent lighting, including gas flares (from 2013)

3. Population density: Population in 100 x 100 m grid cells (from 2010)

4. Temperature, population and land cover at any location. Right-click on the layers to view more information, for example temperature and elevation.



Create or modify an Earth Engine layer

1. In the top menu, click the **Google Earth Engine** layer icon.

2. Select a data set, for example "Elevation".

3. Select **Min / max value**.

The meaning of these values depend on which data set you've selected.

4. Select a **Color scale**.

5. Select the number of **Steps**. The number of steps means the number of distinct colors in the color scale.

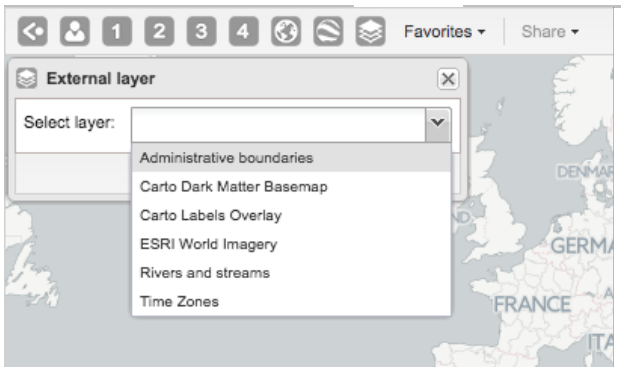
6. Click **Update**.

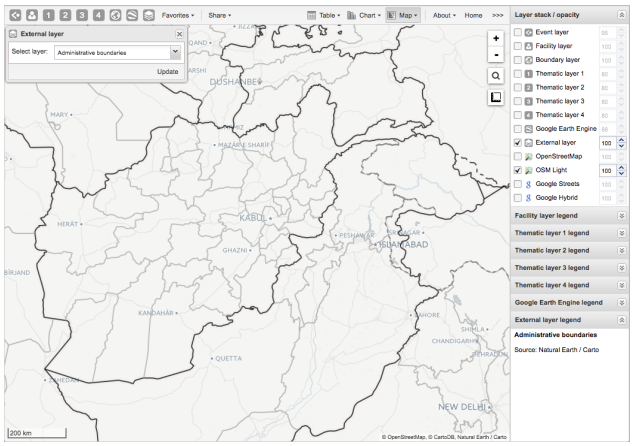
Add external map layers

- In the top menu, click the **External layer** icon.
- Click **Edit** to add a new layer.
- Select a layer from the list.
- Click **Update**. To remove a layer, click **Clear**. To hide a layer, go to the **Layer stack/opacity** menu pane and clear the **External layer** checkbox.

Here are some examples of external layers:

Example 1: First-order administrative boundaries

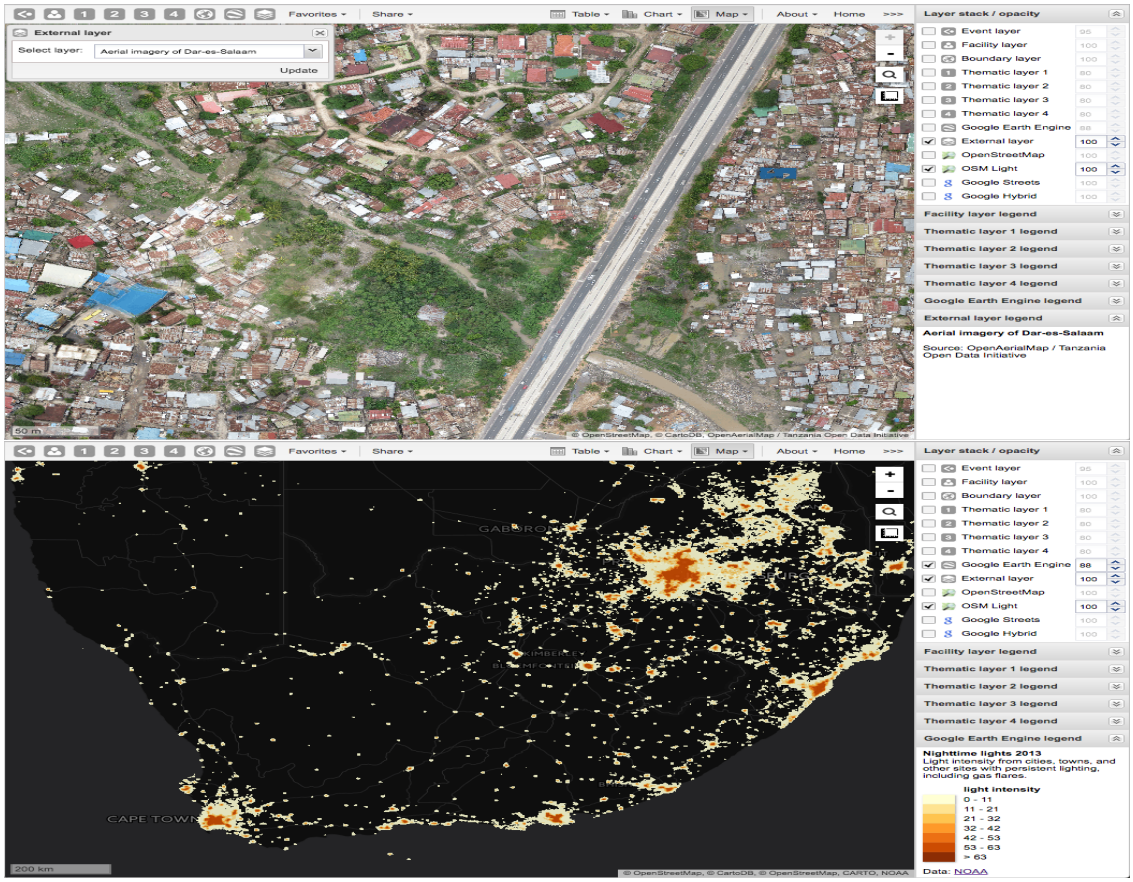


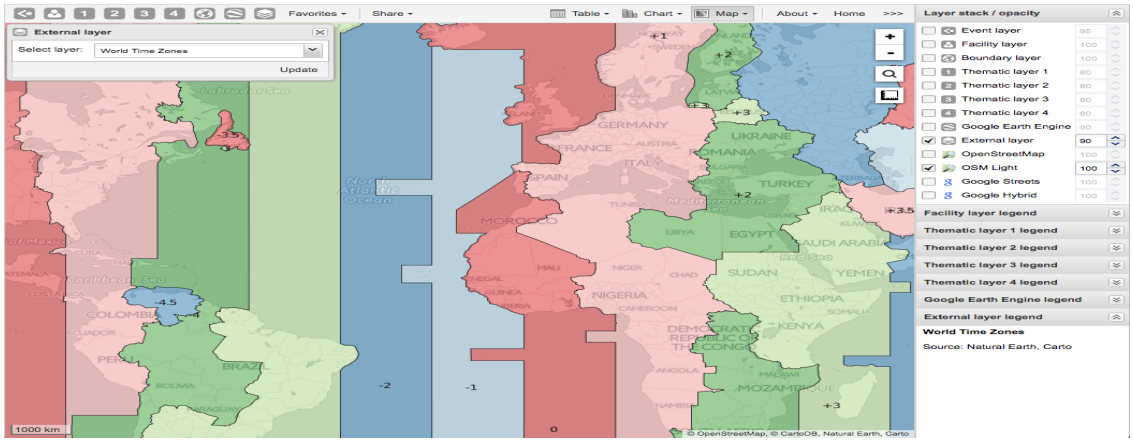


Example 2: Aerial imagery of Dar-es-Salaam

Example 3: Dark basemap with nighttime lights from Google Earth Engine

Example 4: World time zones





Manage map favorites

Favorite maps

Saving your maps as favorites makes it easy to restore them later. It also gives you the opportunity to share them with other users as an interpretation or put it on the dashboard. You can save all types of layers as a favorite. A favorite always opens with the default background map.

Save a map as a favorite

When you have created a map it is convenient to save it as a favorite:

- Click **Favorites**. The **Manage favorites** dialog box opens.
- Click **Add new**. The **Create new favorite** dialog box opens.
- In the text field, type the name you want to give your pivot table.
- Click **Create**. Your favorite is added to the list.

Open a favorite

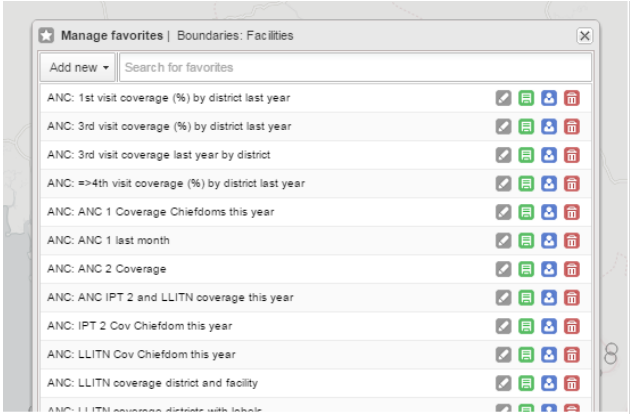
- Click **Favorites**. The **Manage favorites** dialog box opens.
- Find the favorite you want to open. You can either use **Prev** and **Next** or the search field to find a saved favorite. The list is filtered on every character that you enter.
- Click the name.

Rename a favorite

1. Click **Favorites**. The **Manage favorites** dialog box opens.
2. Find the favorite you want to rename. You can either use **Prev** and **Next** or the search field to find a saved favorite.

3. Click the grey rename icon next to the favorite's name.

4. Type the new name and click **Update**.



The **Rename favorite** dialog box favorite opens.

Overwrite a favorite

To save the current map to an existing favorite (overwrite):

1. Click **Favorites**. The **Manage favorites** dialog box opens.

2. Find the favorite you want to overwrite.

Overwrite a favorite

You can either use **Prev** and **Next** or the search field to find a saved favorite.

3. Click the green overwrite icon next to the favorite's name.

4. Click **OK** to confirm that you want to overwrite the favorite.

Share a map interpretation

For certain analysis-related resources in DHIS2, you can share a data interpretation. An interpretation is a link to the relevant resource together with a text expressing some insight about the data.

To create an interpretation of a map and share it with all users of the system:

1. Open or create a favorite map.

2. Click **Share** > **Write interpretation**. The **Write interpretation** dialog box opens.

3. In the text field, type a comment, question or interpretation.

4. Click **Share**. The dialog box closes automatically. You can see the interpretation on the **Dashboard**.

Modify sharing settings for a favorite

After you have created a map and saved it as a favorite, you can share the favorite with everyone or a user group. To modify the sharing settings:

1. Click **Favorites**.

2. Find the favorite you want to share. You can either use **Prev** and **Next** or the search field to find a saved favorite.

3. Click the blue share icon next to the favorite's name.

4. In the text box, enter the name of the user group you want to share your favorite with and click the **+** icon. The chosen user group is added to the list of recipients. Repeat the step to add more user groups.

5. If you want to allow external access, select the corresponding box.

6. For each user group, choose an access setting. The options are: • None • Can view • Can edit and view

7. Click **Save**.

Delete a favorite

1. Click **Favorites**. The **Manage favorites** dialog box opens.

2. Find the favorite you want to delete. You can either use **Prev** and **Next** or the search field to find a saved favorite.

3. Click the red delete icon next to the favorite's name.

4. Click **OK** to confirm that you want to delete the favorite.

Save a map as an image

1. Take a screenshot of the map with the tool of your choice.

2. Save the screenshot in desired format.

Embed a map in an external web page

Certain analysis-related resources in DHIS2, like pivot tables, charts and maps, can be embedded in any web page by using a plug-in. You will find more information about the plug- ins in the Web API chapter in the *DHIS2 Developer Manual*.

To generate a HTML fragment that you can use to display the map in an external web page:

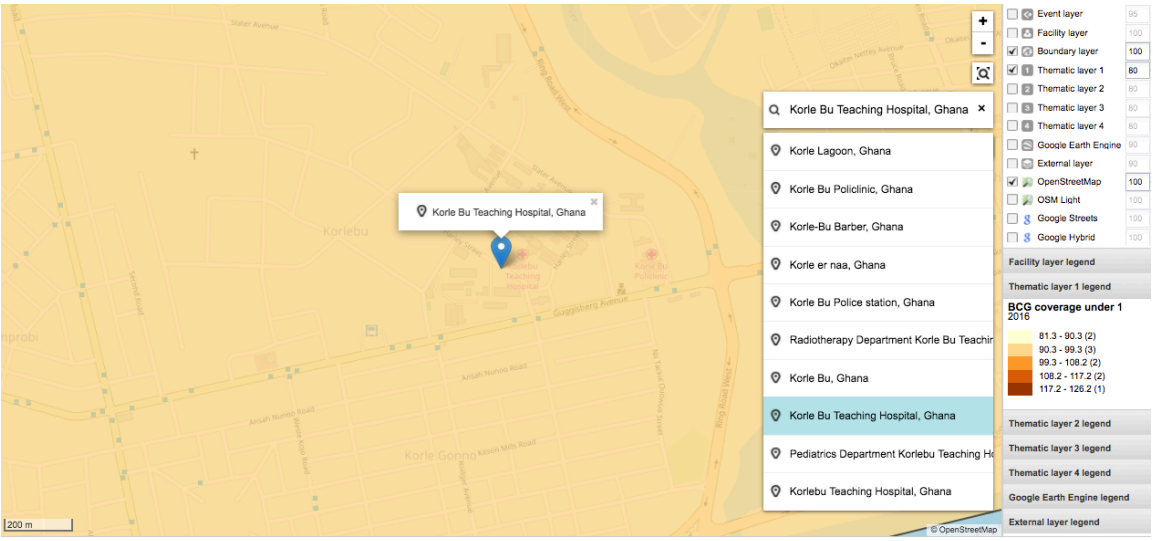
1. Click **Share** > **Embed in web page**.

The **Embed in web page** window opens.

2. Click **Select** to highlight the HTML fragment.

Search for a location

The place search function allows you to search for almost any location or address. The place search is powered by the Mapzen mapping platform. This function is useful in order to locate for example sites, facilities, villages or towns on the map.



1. On the right side of the GIS window, click the magnifier icon.

2. Type the location you're looking.

A list of matching locations appear as you type.

3. From the list, select a location. A pin indicates the location on the map.

Measure distances and areas in a map

1. In the upper left part of the map, put the cursor on the **Measure distances and areas** icon and click **Create new measurement**.

2. Add points to the map.

3. Click **Finish measurement**.

Get the latitude and longitude at any location

Right-click a map and select **Show longitude/latitude**. The values display in a pop-up window.

View a map as a pivot table or chart

When you have made a map you can switch between pivot table, chart and map visualization of your data. The function is inactive if the data the map is based on cannot render as a chart or table.

Open a map as a chart

1. Click **Chart** > **Open this map as chart**. Your current map opens as a chart.

Open a map as a pivot table

1. Click **Chart** > **Open this map as table**. Your current map opens as a pivot table.

Manage dashboards

About dashboards

Dashboards are intended to provide quick access to different analytical objects (maps, charts, reports, tables, etc) to an individual user. Dashboards can also be shared with user groups.

Example 8.1.

A user or administrator could create a dashboard called "Malaria" which might contain all relevant information on malaria. This dashboard could then be shared with the user group called "Malaria control", which might consist of all users of the malaria control program. All users within this group would then be able to view the same dashboard.

Set up the dashboard

The dashboard can contain any number of objects (charts, maps, reports, tables, resources, etc). These can be freely arranged on the dashboard as you wish. Dashboard items can be located and added by searching for favourites, resources, users or messages in the available search box and clicking on the "Add" button.

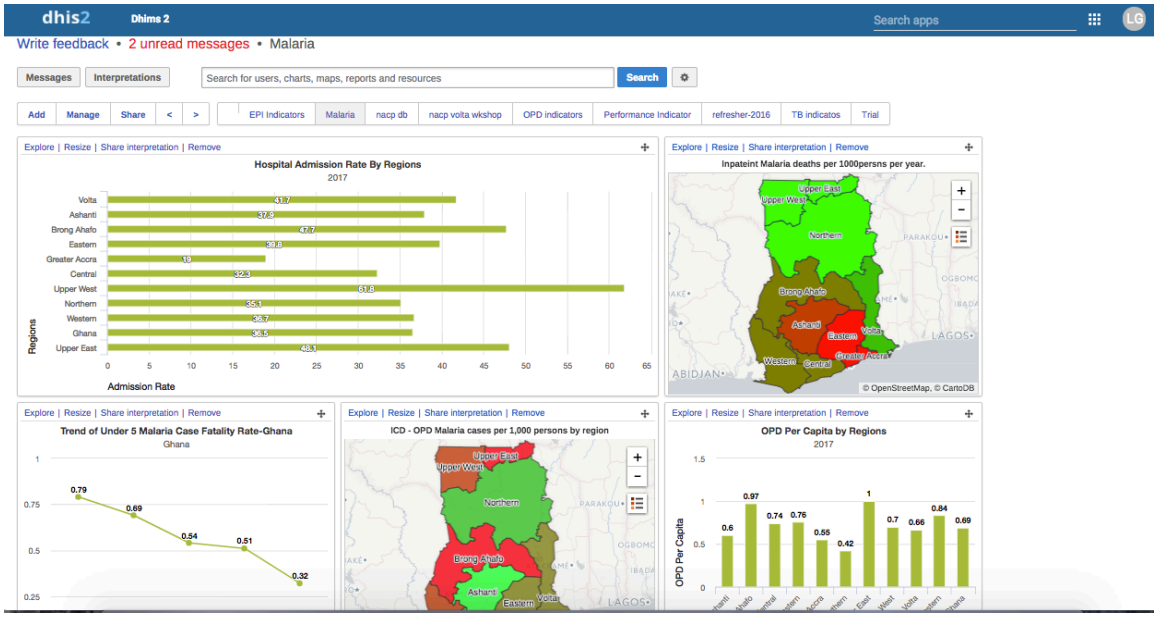
In this screen shot, the dashboard has already been populated with a number of objects, such as charts, map views, tables and messages. There are several hyperlink options available on each item:

- Remove Allows you to remove the item from the dashboard when you have the appropriate user rights.

- Get as Image Opens up a pop-up window and allows you to download the image to your computer.

- Share interpretation Allows you to share an interpretation of the dashboard item. Your interpretation will be shared publicly with other users of the DHIS2 system, in the "Interpretation" section of the dashboard.

- Explore



Loads the favorite in its corresponding app (ie. a map will open full-sized in the GIS app). • Resize

Resizes the dashboard item. There are 3 sizes in which to choose from.

Maps, charts and tables can be viewed as full size as images (in the case of charts and map views) or as HTML resources (in the case of reports, tables and messages).

To reorder how the dashboard appears, simply drag-and-drop any of the objects to a new position. In order to change between the various dashboards which are available, simply select the listed items that are available to review. The list can be scrolled though by using the <, > symbols to the left of the dashboard names.

Change dashboards name

1. Open a DHIS2 dashboard.

2. Click **Manage**.

3. In the **Name** field, type the new name of the dashboard.

4. Click **Rename**.

Add message widget to dashboards

1. Open a DHIS2 dashboard.

2. Click **Manage** and click **Messages**.

Delete dashboards

1. Open a DHIS2 dashboard.

2. Click **Manage** and click **Delete**.

Translate dashboard names

1. Open a DHIS2 dashboard.

2. Click **Manage** and click **Translate**.

3. Select a locale and enter the dashboard name's translation.

4. Click **Save**.

Dashboard sharing

In order to share a dashboard with user groups, first select "Share" from the dashboard page. This will bring up the dashboard sharing settings options. To share the dashboard with specific user groups, type in their name in the sharing settings dialogue box and click on the "+" sign to add them to the dashboard sharing settings

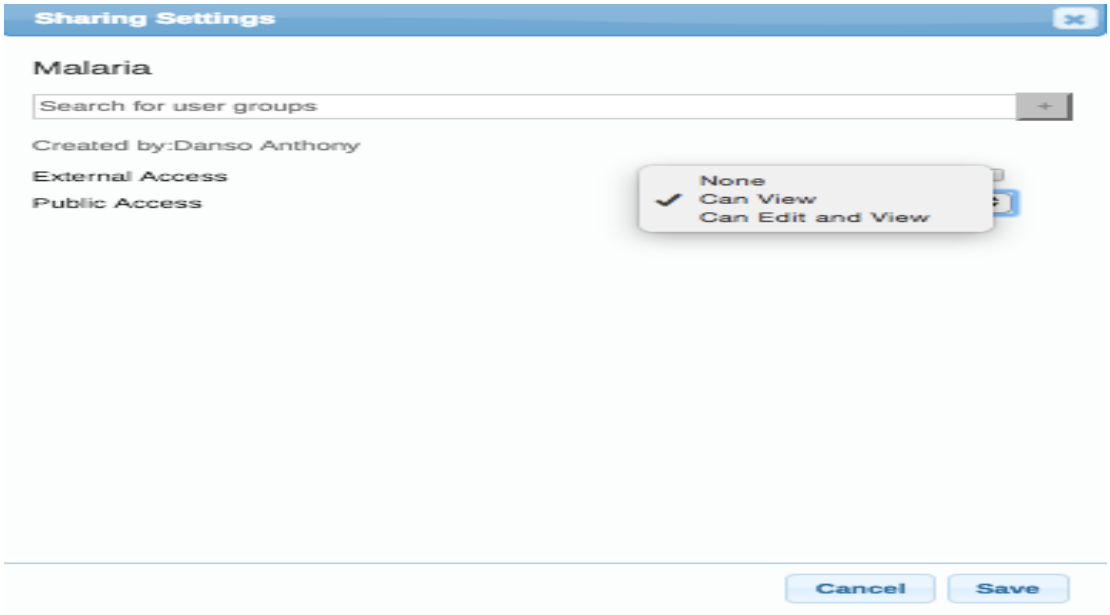
All dashboards have two sharing groups set by default.

- External access (without login) This option, when selected, provides access to the dashboard as an external resource. This is useful for when you are creating an external web portal but would like to call information from a dashboard you have made internally within DHIS2. By default, this option is not selected.

- Public access (with login) This option allows the selected dashboard to be pushed to all users within your DHIS2 instance. This can also be hidden from public view by selecting the "None" option, which is the default option for new dashboards. User groups which have been added manually can be assigned two types of permissions within the dashboard

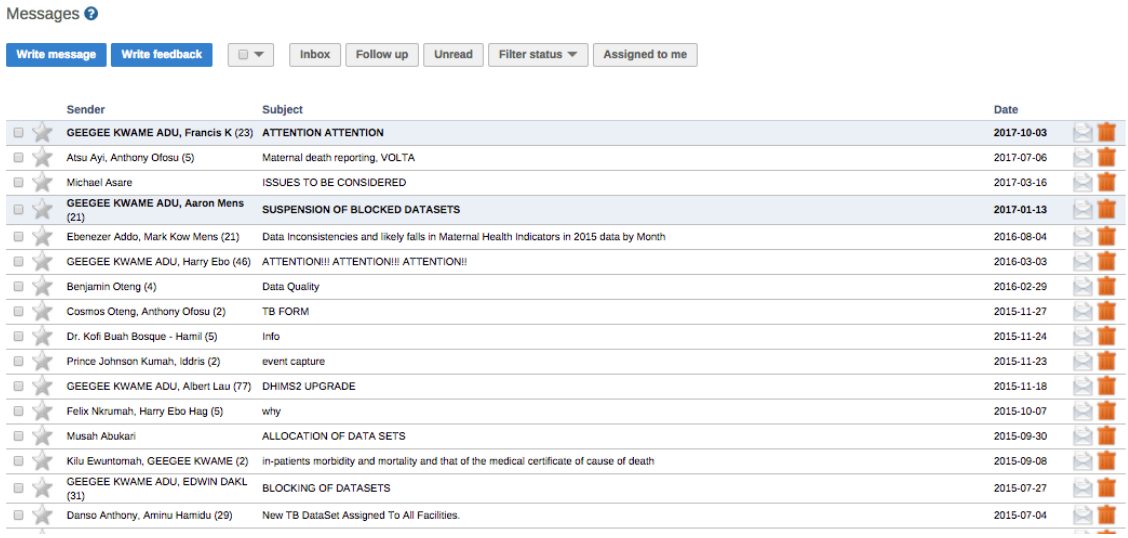
- Can view Provides the user group with view only rights to the dashboard.

- Can edit and view Allows the user groups to edit the dashboard in addition to viewing it. Editing allows for altering the layout, resizing and removing items, renaming/deleting the dashboard etc.



Manage messages and feedback messages

About messages and feedback messages



Within DHIS2 you can send messages and feedback messages to users, user groups and organisation units. When you send a feedback message, it is routed to a particular user group. If you're a member of this user group, you've access to feedback handling tools. You can for example set the status of an incoming feedback to "Pending" while you're waiting for information.

Note

Messages and feedback messages are not sent to users' e-mail addresses, the messages only appear within DHIS2.

Create a message

1. From the **Dashboard**, click **Messages**.

2. Click **Write message**.

3. Define who you want to receive the message. You can send a message to organisation units, users and user groups.

   • In the **To org unit** field, select the organisation units or group of organisation units you want to send the message to.

   • In the **To user** field, select the users or user groups you want to send the message to.

4. Type a subject and a message.

5. Click **Send**.

Read a message

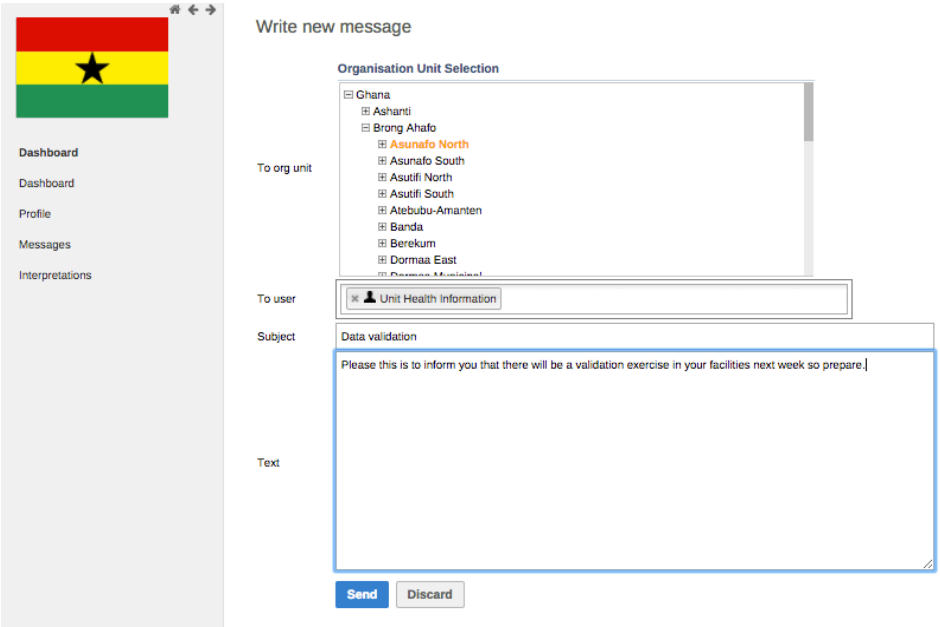
1. From the **Dashboard**, click **Messages**.

2. Click a message.

If the message is part of a conversation, you'll see all messages in this conversation.

Create a feedback message

1. From the **Dashboard**, click **Write feedback**.



Manage dashboards Manage feedback messages

2. Type a subject and a feedback message.

3. Click **Send**.

The feedback message will appear in all of the specified users' inboxes.

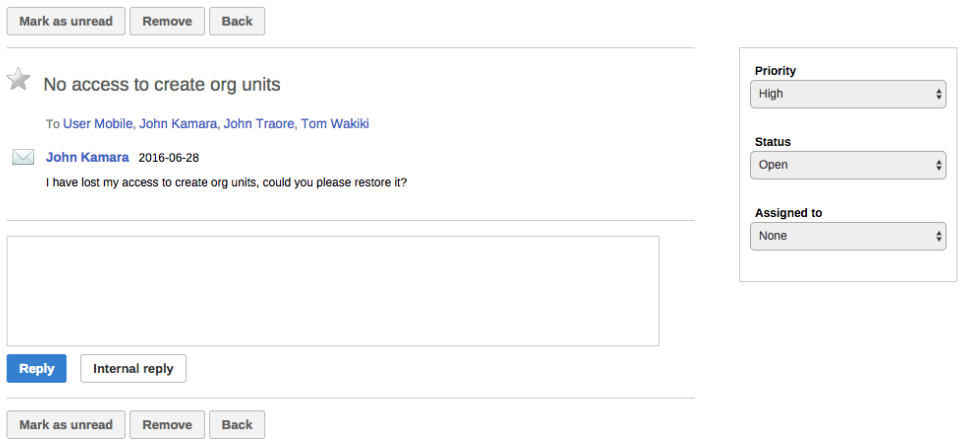
Manage feedback messages

Note

You'll only see feedback messages and have access to the feedback handling tools if you are a member of the user group that is set up to handle feedback messages.

You'll receive feedback messages to your **Messages** inbox. For feedback messages you've the following options in addition to the messages options:

Table 8.1. Feedback handling tools



Function	Description
Priority	You can mark a feedback message with different priorities: **None**, **Low**, **Medium** or **High**. Setting the priority makes it easier to keep track of which feedback message you need resolved first, and which feedback messages that can wait.

Status All feedback messages get the status **Open** when created.

To keep track of existing feedback messages, you can change the status to **Pending**, **Invalid** or **Solved**.

You can filter feedback messages in your inbox

Function	Description
	based on their status. This makes it easier to switch between feedback messages and normal messages.
Assigned to	You can assign a feedback message to any member of

	the user group that is set up to handle feedback messages. **None** means that you haven't assigned a user to the feedback message.
Internal reply	When you work in a feedback handling team you might want to discuss the feedback before sending an answer to the sender. You can keep this discussion in the same message conversation as the feedback itself. To send a reply that within the feedback handling user group, click **Internal reply**.

Configure feedback message function

To configure the feedback message function, you must:

1. Create a user group (for example "Feedback message recipients") that contains all the users who should receive feedback messages.

2. Open the **System Settings** app and click **General** > **Feedback recipients** and select the user group you created in the previous step.

Using the Event Reports app

About the Event Reports app

With the **Event Report**s app you can analyse events in two types of reports:

1. Aggregated event reports: Pivot table-style analysis with aggregated numbers of events By selecting **Aggregated values** from the top-left menu you can use the **Event Reports** app to create pivot tables with aggregated numbers of events. An event report is always based on a program. You can do analysis based on a range of dimensions. Each dimension can have a corresponding filter. Dimensions can be selected from the left-side menu.

2. Individual event reports: Lists of events By selecting **Events** from the top-left menu you can use the **Event Reports** app to make searches or queries for events based on a flexible set of criteria. The report will be displayed as a table with one row per event. Each dimension can be used as a column in the table or as a filter. Each dimension can have a criteria (filter). Data elements of type option set allows for "in" criteria, where multiple options can be selected. Numeric values can be compared to filter values using greater than, equal or less than operators.

Create an event report

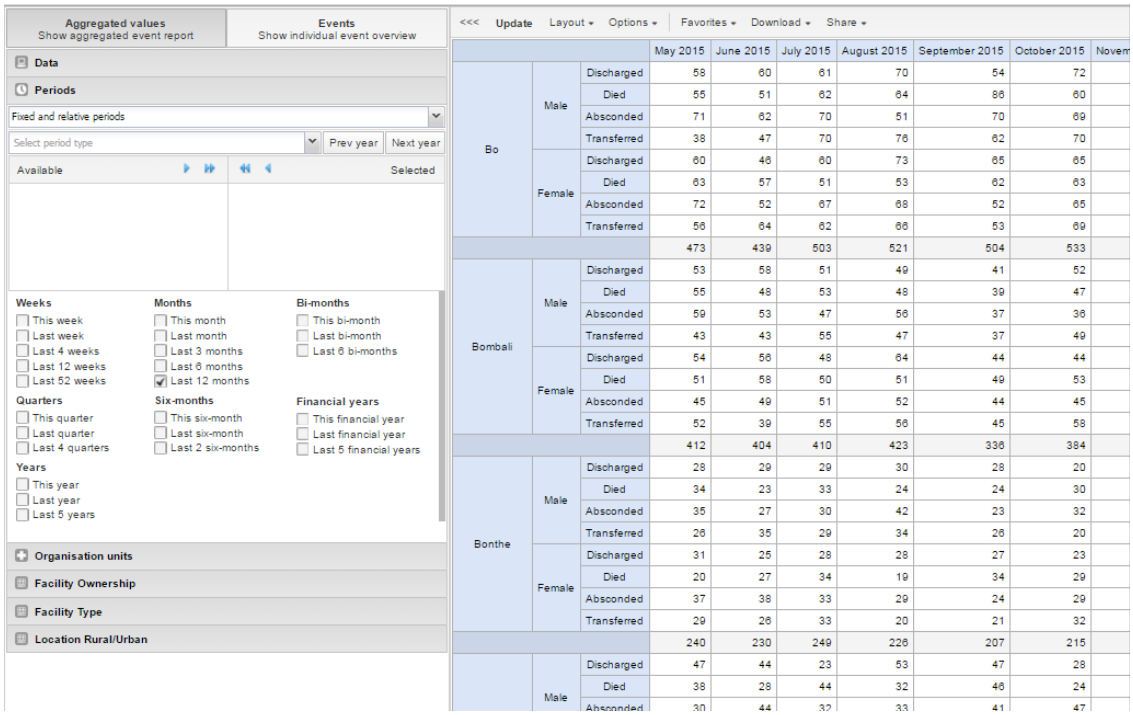
a. Open the **Event Reports** app.

b. Select **Aggregated values** or **Events**.

c. In the menu to the left, select the meta data you want to analyse.

d. Click **Layout** and arrange the dimensions. You can keep the default selection if you want.

e. Click **Update**.



Select dimension items

An event report is always based on a program and you can do analysis based on a range of dimensions. For programs with category combinations, you can use program categories and category option group sets as dimensions for tables and charts. Each dimension item can have a corresponding filter.

3. Select data elements:

    a. Click **Data**.

    b. Select a program and a program stage. The data elements associated with the selected program are listed under **Available**. Each data element acts as a dimension.

    c. Select the data elements you need by double-clicking their names. After selecting a data element, it is visible under **Selected data items**.

    d. (Optional) For each data element, specify a filter with operators such as "greater than", "in" or "equal" together with a filter value.

4. Select periods.

    a. Click **Periods**.

    b. Select one or several periods. You have three period options: relative periods, fixed periods and start/end dates. You can combine fixed periods and relative periods in the same chart. You cannot combine fixed periods and relative periods with start/end dates in the same chart. Overlapping periods are filtered so that they only appear once.

        i. Fixed periods: In the **Select period type** box, select a period type. You can select any number of fixed periods from any period type. Fixed periods can for example be "January 2014".

        ii. Relative periods: In the lower part of the **Periods** section, select as many relative periods as you like. The names are relative to the current date. This means that if the current month is March and you select **Last month**, the month of February is included in the chart. Relative periods has the advantage that it keeps the data in the report up to date as time goes.

        iii. Start/end dates: In the list under the **Periods** tab, select **Start/end dates**. This period type lets you specify flexible dates for the time span in the report.

5. Select organisation units.

    a. Click **Organisation units**.

    b. Click the gearbox icon.

    c. Select a **Selection mode** and an organisation unit. There are three different selection modes:

d. Click **Update**

Table 10.1. Selection modes Select organisation units

Lets you select the organisation units you want to appear in the chart from the organization tree.

Select **User org unit** to disable the organisation unit tree and only select the organisation unit that is related to your profile.

Select **User sub-units** to disable the organisation unit tree and only select the sub-units of the organisation unit that is related to your profile.

Selection mode	Description

Selection mode	Description
	Select **User sub-x2-units** to disable the organisation unit tree and only select organisation units two levels down from the organisation unit that is related to your profile. This functionality is useful for administrators to create a meaningful "system" favorite. With this option checked all users find their respective organisation unit when they open the favorite.
Select levels	Lets you select all organisation units at one or more levels, for example national or district level. You can also select the parent organisation unit in the tree, which makes it easy to select for example, all facilities inside one or more districts.
Select groups	Lets you select all organisation units inside one or several groups and parent organisation units at the same time, for example hospitals or chiefdoms.

Select series, category and filter

You can define which data dimension you want to appear as columns, rows and filters in the pivot table. Each data element appears as individual dimensions and can be placed on any of the axes.

Note

Data elements of continuous value types (real numbers/decimal numbers) can only be used as filters, and will automatically be positioned as filters in the layout dialog. The reason for this is that continuous number cannot be grouped into sensible ranges and used on columns and rows.

1. Click **Layout**.

2. Drag and drop the dimensions to the appropriate space.

3. Click **Update**.

Change the display of your table

You can customize the display of an event report.

1. Click **Options**.

2. Set the options as required. Available options are different between aggregated event reports and individual event reports.

3. Click **Update**.

Table 10.2. Event reports options

Option		Description	Available for report type
Data	**Show column totals**	Displays totals at the end of each column in the pivot table.	Aggregated event report

Option		Description	Available for report type
	Show column sub-totals	Displays sub-totals for each column in the pivot table.	Aggregated event report
	Show row totals	Displays totals at the end of each row in the pivot table.	Aggregated event report
	Show row sub-totals	Displays sub-totals for each row in the pivot table.	Aggregated event report
	Show dimension labels	Displays labels for dimensions.	Aggregated event report
	Hide empty rows	Hides empty rows in the pivot table.	Aggregated event report
	Hide n/a data	Hides data tagged as N/A from the chart.	Aggregated event report
	Include only completed events	Includes only completed events in the aggregation process. This is useful when you want for example to exclude partial events in	Aggregated event report Individual event report

		indicator calculations.	
	Limit	Sets a limit of the maximum number of rows that you can display in the table, combined with a setting for showing top or bottom values.	Aggregated event report
	Output type	Defines the output type. The output types are **Event**, **Enrollment** and**Tracked entity instance**.	Aggregated event report
	Program status	Filters data based on the program status: **All**, **Active**, **Completed** or **Cancelled**.	Aggregated event report
	Event status	Filters data based on the event status: **All**, **Active**, **Completed**, **Scheduled**, **Overdue** or **Skipped**.	Aggregated event report
Organisation units	**Show hierarchy**	Includes the names of all parents of each organisation unit in labels.	Aggregated event report
Style	**Display density**	Controls the size of the cells in the table. You can set it to **Comfortable**, **Normal** or **Compact**. **Compact** is useful when you want to fit large tables into the browser screen.	Aggregated event report Individual event report

Option		**Description**	**Available for report type**
	Font size	Controls the size of the table text font. You can set it to **Large**, **Normal** or **Small**.	Aggregated event report Individual event report
	Digit group separator	Controls which character to separate groups of digits or "thousands". You can set it to **Comma**, **Space** or **None**.	Aggregated event report Individual event report

Download chart data source

You can download the data source behind an event report in HTML, JSON, XML, Microsoft Excel or CSV formats.

1. Click **Download**.
2. 2. Under **Plain data source**, click the format you want to download.

Table 10.3. Available formats

Format	Description
HTML	Creates HTML table based on selected meta data
JSON	Downloads data values in JSON format based on selected meta data
XML	Downloads data values in XML format based on selected meta data
Microsoft Excel	Downloads data values in Microsoft Excel format based on selected meta data
CSV	Downloads data values in CSV format based on selected meta data

Manage favorites
Saving your charts or pivot tables as favorites makes it easy to find them later. You can also choose to share them with other users as an interpretation or display them on the dashboard.

You view the details and interpretations of your favorites in the **Pivot Table**, **Data Visualizer**, **Event Visualizer**, **Event Reports** apps. Use the **Favorites** menu to manage your favorites.

Open a favorite

1. Click **Favorites** > **Open**.
2. Enter the name of a favorite in the search field, or click **Prev** and **Next** to display favorites.
3. Click the name of the favorite you want to open.

Save a favorite

1. Click **Favorites** > **Save as**.

2. Enter a **Name** and a **Description** for your favorite.

3. Click **Save**.

Rename a favorite

1. Click **Favorites** > **Rename**.

2. Enter the new name for your favorite.

3. Click **Update**.

Write an interpretation for a favorite

An interpretation is a link to a resource with a description of the data at a given period. This information is visible in the **Dashboard** app. To create an interpretation, you first need to create a favorite. If you've shared your favorite with other people, the interpretation you write is visible to those people.

- Click **Favorites** > **Write interpretation**.
- In the text field, type a comment, question or interpretation. You can see this information in the **Dashboard** app.
- Search for a user group that you want to share your favorite with, then click the **+** icon.
- Change sharing settings for the user groups you want to modify.

  Can edit and view: Everyone can view and edit the object.

  Can view only: Everyone can view the object.

  None: The public won't have access to the object. This setting is only applicable to **Public access**.

- Click **Share**.

Create a link to a favorite

1. Click **Favorites** > **Get link**.

2. Select one of the following:

a. Open in this app: You get a URL for the favorite which you can share with other users by email or chat.

b. Open in web api: You get a URL of the API resource. By default this is an HTML resource, but you can change the file extension to ".json" or ".csv".

Delete a favorite

1. Click **Favorites** > **Delete**.

2. Click **OK**.

View interpretations based on relative periods

To view interpretations for relative periods, such as a year ago:

1. Open a favorite with interpretations.

2. Click **>>>** in the top right of the workspace.

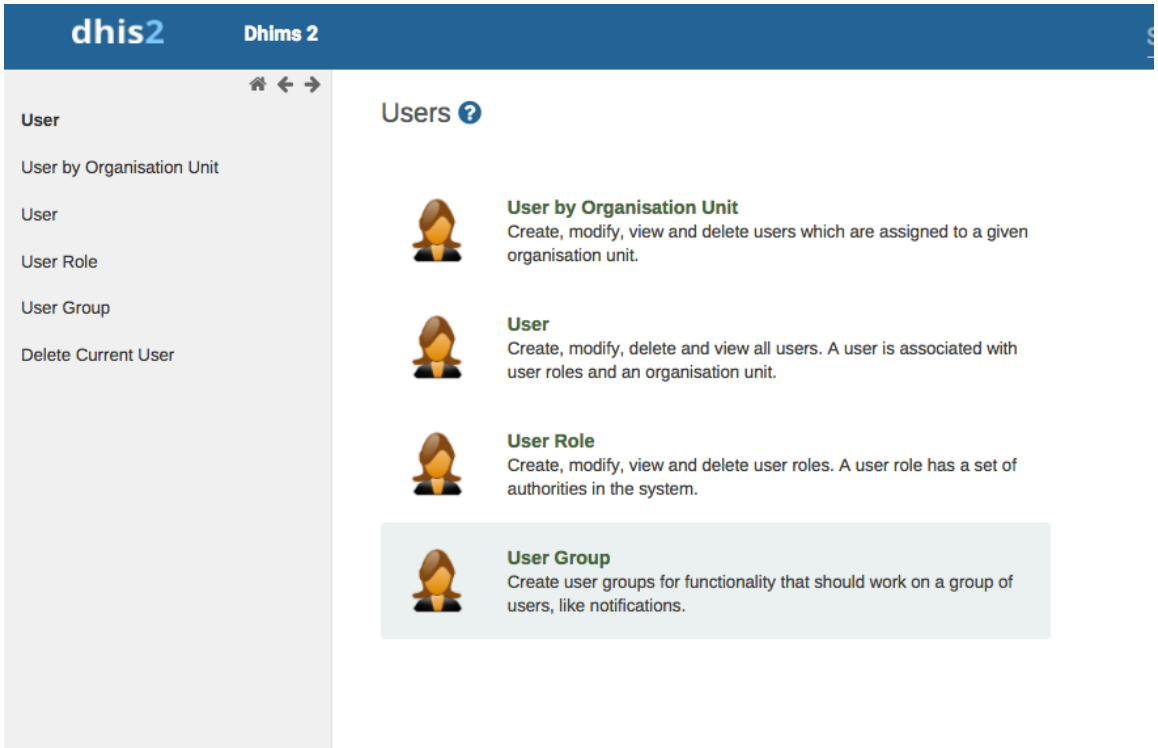
3. Click an interpretation. Your chart displays the data and the date based on when the interpretation was created. To view other interpretations, click them.

Visualize an event report as a chart

When you have made an event report you can open it as a chart: Click **Chart** > **Open this chart as table**.

Manage users

Create a user

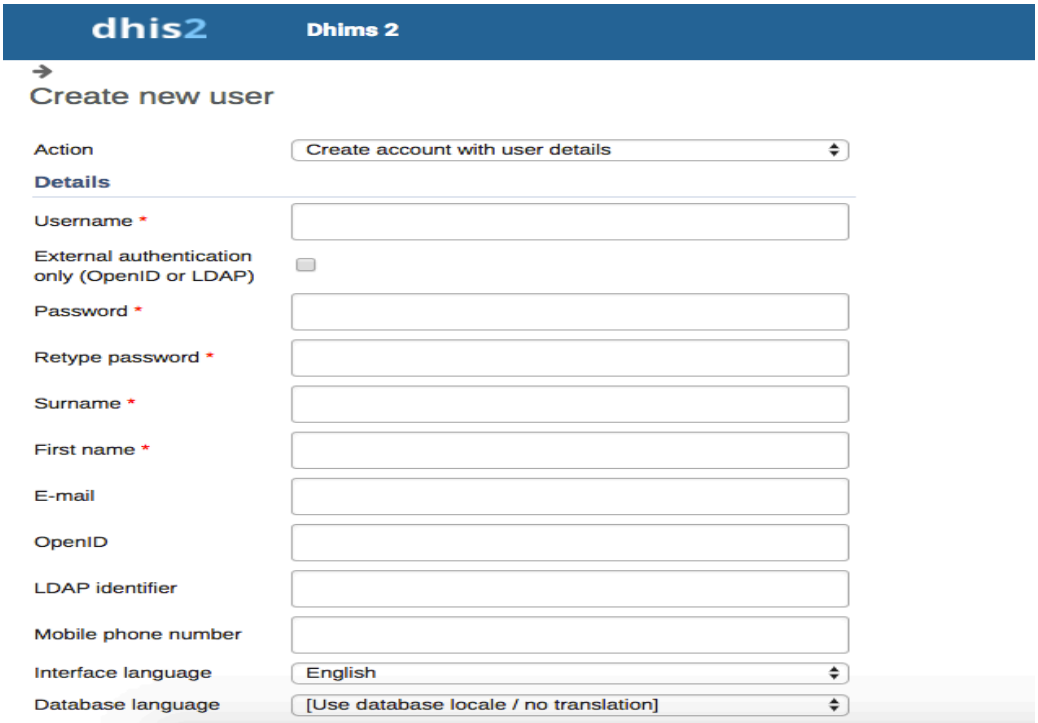


1. Open the **Users** app and click **User**.

2.Click **Add new**.

3. Select whether you want to fill in all the personal user information, or invite the user by email to complete the rest of the user information:

- **Create account with user details**



Choose this option if you would like to enter all the details of the new user such as name, password, etc.

Enter the following information: user name, password, surname, first name, email, OpenID account (if any) and mobile phone number (if any).

After you've created the user, the account is ready for the user to use with the user name and password that you provide.

• **Email invitation to create account**

Choose this option if you want to send an invitation by email to the user. Then she/he must return to DHIS2 and finish setting up their user account. The account that the user finishes setting up will be limited according to how you configure the account.

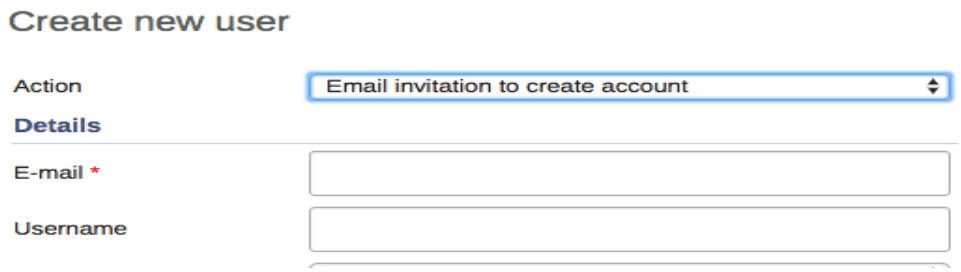
Note

You may not select this option to create an account with "critical" system authorities such as All, Scheduling Administration, Perform maintenance tasks, Merge organisation units, Eliminate duplicate data elements, SQL View Management, Change system settings, and List, Add or Delete user roles.

In order to use this feature "Enable email message notifications" in SystemSettings -> Messaging should be checked.

Enter the email address to which the invitation should be sent. If you want to, you may also enter the user name that the account will have. If you leave the user name empty, then the user may choose their own user name when they respond to the invitation (as long as it is not taken already for another user.)

After you've created the user, the system sends two emails to the address you provided. One contains a unique web link by which the user can return to the system and activate their account by entering the rest of their user information. The other email contains a unique code that they must enter into the system in order to complete the registration, after following the link in the first email. The user must finish setting up the account within three months, after that the invitation becomes invalid.



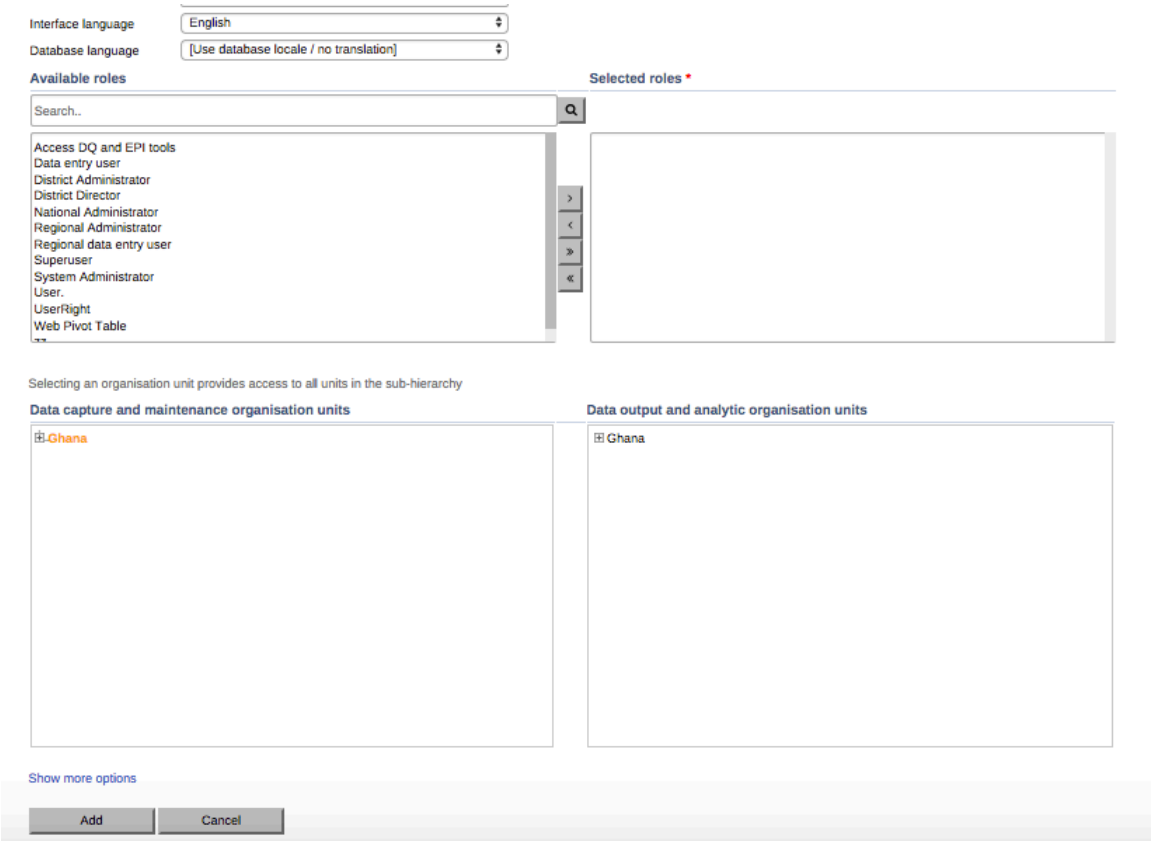
1. Select an **Interface language**. You can select a language into which fixed elements of the DHIS2 user interface have been translated.

2. Select a **Database language**. You can select a language into which implementation-supplied items have been translated in the database, for example data element names or organisation unit level names.

3. In the **Available roles** section, double-click the user roles you want to assign to the user.

4. Select **Data capture and maintenance organisation units**. The data capture and maintenance organisation units control for which organisation units the user can do data entry. You must assign at least one data capture and maintenance organisation unit to each user. Users will have access to all sub-organisation units of the assigned organisation units. For example, if you've assigned a user to a district which has several facilities contained in the district, the user would have access to the district's data, as well as all of the facilities contained within the district.

5. (Optional) Select **Data output and analysis organisation units**. The data output and analysis organisation units controls for which organisation units the user can view aggregated data in the analytics apps, for example the **Pivot Table** and **GIS** apps. You can assign any number of data output and analysis organisation units to a user. Users will have access to all sub-organisation units of the assigned organisation units. You shouldn't select the descendants of an organisation unit which you have already selected. For example, if you've assigned the user to a district, you shouldn't select the facilities within that district.

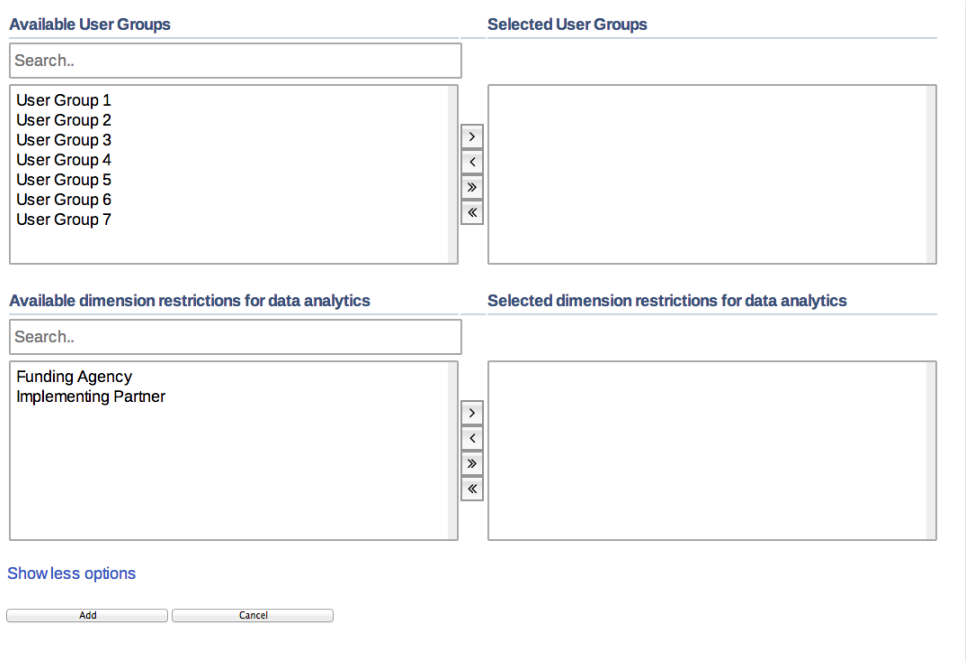


Note

Assigning data output and analysis organisation units organisation units is optional. If you don't specify any organisation unit, the user will have access to the full organisation unit hierarchy for viewing aggregated data. As with the data capture organisation units, *you should not select descendant organisation units of a unit which you have already selected*.

In several places in the analytics apps, you can select "user organisation unit" for the organisation unit dimension. This mechanism will first attempt to use the data view organisation units linked to the current user. If not found, it will use the data capture and maintenance organisation units. If the user has been assigned to multiple organisation units, the use of "user organisation unit" may result in unpredictable behavior.

9. Click **Show more options**.



10 (.Optional) In the **Available user groups** section, double-click the user groups you want to assign to the user.

11 (.Optional) In the **Available dimension restrictions for data analytics** section, double- click the dimensions you want to assign to the user.

You can restrict the values the user sees in data analytics apps by selecting dimensions that will restrict the user's view.

Example 16.3.

Let's say you have defined *Implementing Partner* as a category option group set, and you have shared with this user only one or more specific implementing partners (category option groups). If you want to make sure that the user does not see totals in analytics that include values from other groups, assign *Implementing Partner* to the user. This insures that any data visible to the user through the analytics apps will be filtered to select only the Implementing Partner category option group(s) which are visible to the user.

Edit user objects

1. Open the **Users** app and find the type of user object you want to edit.

2. In the object list, click the relevant object and select **Edit**.

3. Modify the options you want.

4. Click **Save**.

Disable users

Disable users

You can disable a user. This means that the user's account is not deleted, but the user can't log in or use DHIS2.

1. Open the **Users** app and click **User**.

2. In the list, click the relevant user and select **Disable**.

3. Click **OK** to confirm.

Display a user's profile

1. Open the **Users** app and click **User**.

2. In the list, click the relevant user and select **Profile**.

View users by organisation unit

You can view all users that have been assigned to a particular organisation unit.

1. Open the **Users** app and click **User by organisation unit**.
2. In the left-hand organisation unit tree, click an organisation unit.

A list of users which have been assigned to this organisation unit is displayed.

Assign search organisation units to users

1. Open the **Users** app and click **User**.

2. In the object list, click the relevant user and select **Assign search org units**. 3. Click the organisation units you want the user to be able to search in.

4. Click **Save**.

Delete current user

You can delete the user that is currently logged into the system.

1. Open the **Users** app and click **Delete current user**.

2. Enter your password and click **Delete**.

Clone users

1. Open the **Users** app and click **User**.

2. In the object list, click the relevant user and select **Replicate**.

3. Enter a new user name and password for the cloned user account.

4. Click **Replicate**.

5. In the object list, click the user you just created and click **Edit**.

6. Modify the options you want.

7. Click **Save**.

Change user password

The following rules apply when you create a new password:

Change user password

- Password must contain at least one special character, that is any character other then alphabets and digit numbers.

- Password must contain at least one upper case character.

- Password must contain at least one digit number.

- Password can not contain user's user name or email address.
- Password can not contain generic words for example *system*, *admin*, *user*, *login*, *manager* etc.
- Password can not be one of the previous 24 passwords the user has used. This doesn't apply in case a super user resets the password for another user.
- Password must contain more than minimum number of characters.

Note :

You can configure the minimum number of characters: Open the **System Settings** app and click **Access** > **Minimum characters in password**.

- Password can not contain more than 40 characters To change a user's password:
- 1. Open the **Users** app and click **User**.
- 2. In the object list, click the relevant user and select **Edit**.
- 3. Enter a new password and retype it.
- 4. Click **Save**.

Delete user objects

1. Open the **Users** app and find the type of user object you want to delete.

2. In the object list, click the relevant object and select **Remove**.

3. Click **OK** to confirm.

Display details of user objects

1. Open the **Users** app and find the type of user object you want to view.

2. In the object list, click the relevant object and select **Show details**.

Manage organisation units

In this section you will learn how to:

• Create a new organisation unit and build up the organisation unit hierarchy

• Create organisation unit groups, group sets, and assign organisation units to them • Modify the organisation unit hierarchy

About organisation units

The organisation unit hierarchy defines the organisation structure of DHIS2, for example how health facilities, administrative areas and other geographical areas are arranged with respect to each other. It is the "where" dimension of DHIS2, similar to how periods represent the "when" dimension.

The organisation unit hierarchy is built up by parent-child relations. In DHIS2, each of these nodes is an organisation unit. A country might for example have eight provinces, and each province might have a number of districts as children. Normally, the lowest levels consist of facilities where data is collected. Data collecting facilities can also be located at higher levels, for example national or provincial hospitals. Therefore, you can create skewed organisation trees in DHIS2.

- You can only have one organisation hierarchy at the same time.
- You can have any number of levels in a hierarchy. Typically national organisation hierarchies in public health have four to six levels.
- You can create additional classifications by using organisation groups and organisation group sets. For example to create parallel administrative boundaries to the health care sector.

- It is recommended to use organisation unit groups to create a non-geographical hierarchy.

- An organisation unit can only be a member of a single organisation unit group within an organisation unit group set.

- An organisation unit group can be part of multiple organisation unit group sets.

- The organisation unit hierarchy is the main vehicle for data aggregation on the geographical dimension.

- When you close an organisation unit, you can't register or edit events to this organisation unit in the **Event Capture** and **Tracker Capture** apps.

Changing the organisation unit hierarchy

You can change the organisation unit hierarchy after you've created it, even organisation units that collect data. However, DHIS2 always uses the latest hierarchy for data aggregation. So if you change the hierarchy, you loose the temporal representation of the hierarchy across time.

Example

District A is sub-divided into District B and District C. Facilities which belonged to District A are reassigned to District B and C. Any historical data, which you entered before the split occurred, is still registered as belonging to District B and C, not to the obsolete District A. In the **Maintenance** app, you manage the following organisation unit objects:

Table

Organisation unit objects in the Maintenance app

Object type	Available functions
Organisation unit	Create, edit, clone, delete, show details and translate
Organisation unit group	Create, edit, clone, share, delete, show details and translate
Organisation unit group set	Create, edit, clone, share, delete, show details and translate
Organisation unit level	Edit and translate
Hierarchy operations	Move organisation units

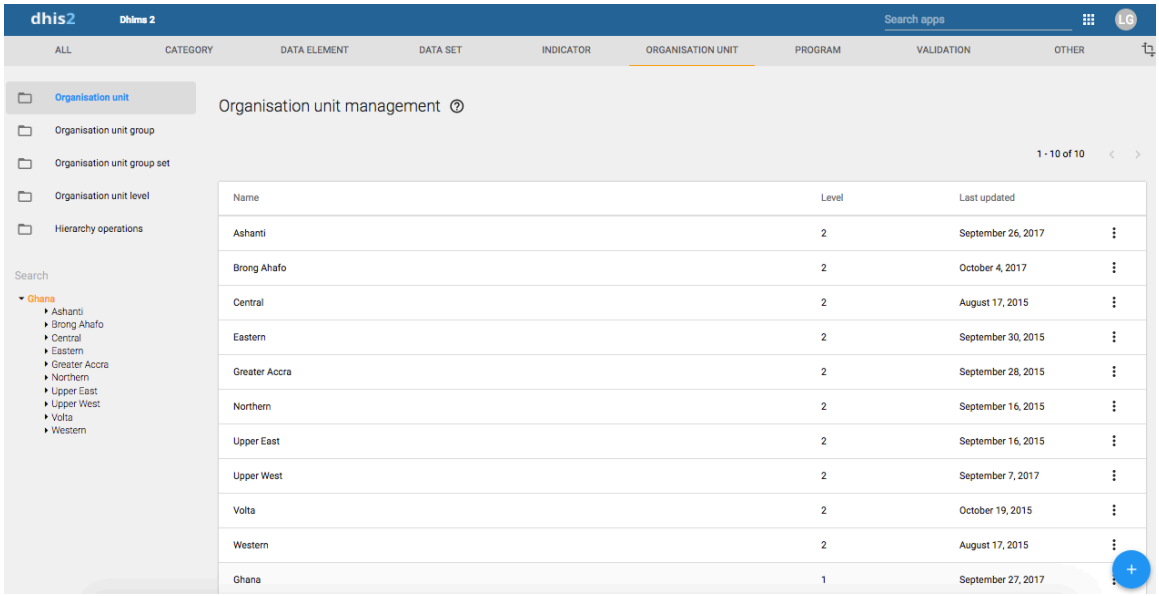
Configure metadata Create or edit an organisation unit

1. Create organisation units.

2. Create organisation unit groups.

3. Create organisation unit group sets.

Create or edit an organisation unit



You add organisation units to the hierarchy one by one, either as a root unit or as a child of a selected organisation unit. You can only have one root unit.

1. Open the **Maintenance** app and click **Organisation unit** > **Organisation unit**.

2. Click the add button.

3. Select which organisation unit your new organisation unit will belong to: a. Click **Parent organisation unit**. b. In the organisation unit tree, locate the parent organisation unit and select it. Your selection is marked in yellow.

Tip Click the arrows to expand the organisation unit tree.

c. Click **Select**.

4. Enter a **Name** of the organisation unit. Each organisation unit must have an unique name.

5. Enter a **Short name** for the organisation unit. Typically, the short name is an abbreviation of the full organisation unit name. This attribute is often used in reports to display the name of the organisation unit, where space is limited.

6. (Optional) Assign a **Code**. In many countries organisation units are assigned a code.

7. (Optional) Type a **Description** of the organisation unit.

8. Select an **Opening date**. The opening dates control which organisation units that existed at a point in time, for example when analysing historical data.

9. If applicable, select a **Closed date**.

10I.n the **Comment** field, enter any additional information that you would like to add.

11(.Optional) In the **URL** field, enter a link to an external web site that has additional information about the organisation unit.

12E.nter contact information:

• Contact person

• Address

• E-mail

• Phone number 13(.Optional) Enter **Latitude** and **Longitude**.

You must have latitude and longitude values to create maps in the **GIS** app. Then your organisation units can be represented as points on a map, for example a health facility. Without this information, the **GIS** app will not work.

It might be more efficient to import coordinates later as a batch job for all organisation units using the **Import-Export** app. You also use the **Import-Export** app to create polygons. A polygon is an organisation unit that represent an administrative boundary.

14I.f applicable, select **Data sets** and assign them.

Note

You control whether a user should be able to assign data sets to an organisation unit in the **System Settings** app:

Open the **System Settings** app, click **Access** and select **Allow assigning object to related objects during add or update**.

15 If applicable, enter custom attributes values, for example **HR identifier**.

Note

You configure the custom attributes in the **Maintenance** app:

Open the **Maintenance** app and click **Other** > **Attribute**.

16. Click **Save**.

Create or edit an organisation unit group

Organisation unit groups allow you to classify related organisation units into a common theme. You can for example group all organisation units that are hospitals in a **Hospital** group.

- Open the **Maintenance** app and click **Organisation unit** > **Organisation unit group**.
- Click the add button.
- Fill in the form:
- a. **Name**: Provide a precise, unique and descriptive name for the organisation unit group.
- b. **Short name**: The short name should be less than 25 characters. Typically, the short name is an abbreviation of the full organisation unit name. This attribute is used in certain places in DHIS2 where space is limited.
- c. **Code** d. **Symbol**: Select a symbol which will be used to display the organisation unit (points only) when the layer is displayed in the **GIS** app.
- In the organisation tree, click the organisation units you want to add to the organisation unit group.

You can locate an organisation unit in the tree by expanding the branches (click on the arrow symbol), or by searching for it by name.

The selected organisation units display in orange.

5. Click **Save**.

Create or edit an organisation unit group set

Organisation unit group sets allows you to create additional classifications of organisation units. The group sets create new dimensions so that you can make a more detailed data analysis. You an easily filter, organise or aggregate data by groups within a group set.

1. You can have any number of organisation unit group sets.
2. The default organisation unit group sets are **Type** and **Ownership**.

3. An organisation unit can only be a member of a single organisation unit group within an

organisation unit group set.

4. An organisation unit group can be part of multiple organisation unit group sets.

5. You can define whether an organisation unit group set is compulsory or not, which will affect the completeness of the data. Compulsory means that all organisation units must be member of a group in that group set.

Data completeness

In the **Data integrity** part of the **Data administration** app you can verify if you've accidentally assigned the same organisation unit to multiple groups within the same group set. In this app you also find information about organisation units that are not members of a compulsory organisation unit group set.

1. Open the **Maintenance** app and click **Organisation unit** > **Organisation unit group set**.

2. Click the add button.

3. Fill in: a. **Name**: Provide a precise name for the organisation unit group set. b. **Code** c. **Description**: Describe what the organisation unit group set measures or captures.

4. If you want all organisation units to be members of a group within the group set, select **Compulsory**.

5. (Optional) Select **Data dimension**.

6. (Optional) Select **Include subhierarchy in analytics**. If you select this, a sub-organisation unit will inherit the organisation unit group property from its closest "parent" organisation unit. Any property on the sub-organisation unit will override the inherit value. If an organisation unit have no associated organisation unit group, the organisation unit can inherit its closest parent's organisation unit group. If none of the parent organisation unit groups have an organisation unit group for a given org unit group set, the result will still be "blank", but if at least one parent has an organisation unit group, sub-organisation unit will inherit it. include subhierarchy in analytics" is enabled, which means the org units inherit their closest parents org unit group IF the org unit is white (no org unit group associated with it).

7. Select organisation unit groups and assign them.

In the left-hand list, you find the available organisation unit groups. Use the arrows to move selected groups between the two lists.

If there are no organisation unit groups in the left-hand list, click **Add new**.

In the form that opens, create the organisation units group you need. When you're done, click **Refresh values**.

Note

An organisation unit can only be a member of a single organisation unit group within an organisation unit group set.

8. Click **Save**.

Example

Classify facilities based on ownership

You want to analyse data based on the ownership of the facilities. All facilities have an owner so you need to make sure that all organisation units get this classification. To do that you can use the **Compulsory** option:

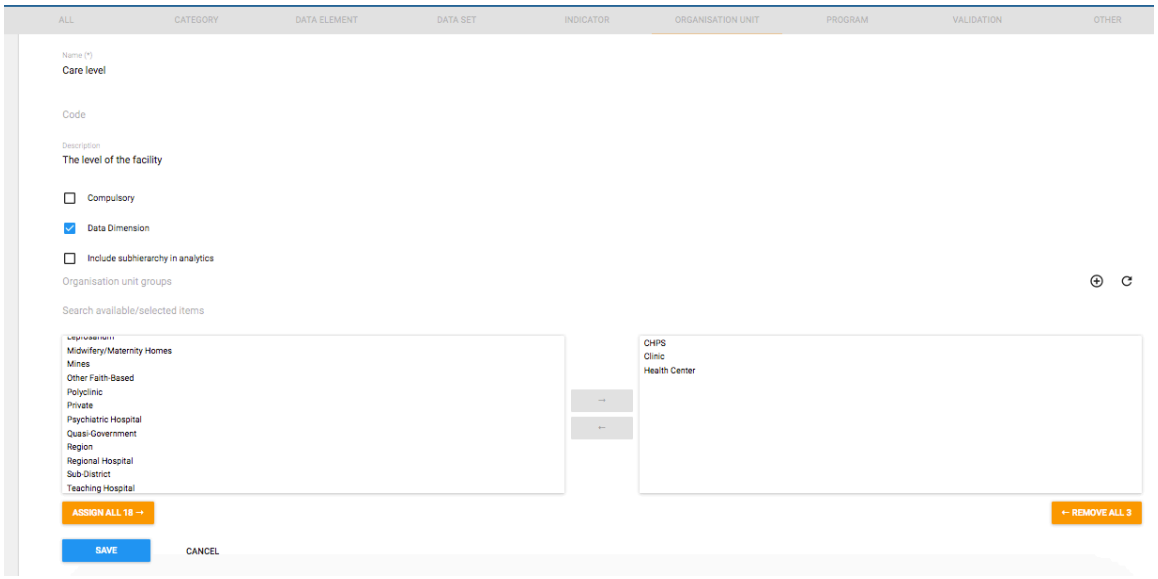
1. Create a group for each ownership type, for example "Government", "Private" and "CHAG".

2. Assign all facilities in the database to one of these groups.

3. Create an organisation unit group set called "Ownership" and select **Compulsory**.

4. Assign the organisation unit groups " Government ", "Private" and "CHAG" to the "Ownership" organisation group set.

Configure metadata Assign names to organisation unit levels



Group your organisation unit in two ways and aggregate data on these two parallel hierarchies Use to aggregate data (only in analytics apps)

An additional setting to the organisation unit group set, creates a dynamic "membership" to a organisation unit group set.

You don't change the organisation unit hierarchy Scalable and dynamic. Dynamic inclusion of hierarchy Dynamic additional classification

Assign names to organisation unit levels

When you add children to an organisation unit, DHIS2 automatically creates a new organisation unit level if necessary. The system also assigns a generic name to this level, for example "Level 5". You can replace the generic name with a contextual name, for example "National", "Region", "District" or "Sub-district". DHIS2 uses the contextual names anywhere levels are referred to, for example in the **GIS** app.

1. Open the **Maintenance** app and click **Organisation unit** > **Organisation unit level**.

The loading time of the list depends on the depth of the organisation unit hierarchy tree.

2. For the organisation unit levels you want to modify, type a name. 3. Select the number of offline levels.
3. Click **Save**

Note :

You configure the default value in the **System Settings** app:

Open the **System Settings** app, click **General** and select a level in the **Max offline organisation unit levels** list.

Move organisation units within a hierarchy

You can move organisation units within in the hierarchy by changing the parent of a selected organisation unit.

1. Open the **Maintenance** app and click **Organisation unit** > **Hierarchy operations**.
2. In the left-hand hierarchy tree, select the organisation unit(s) you want to move.

Note If the selected organisation unit is has sub-organisation units, all of them move to the new parent organisation unit.

3. In the right-hand hierarchy tree, select which organisation unit you want to move the selected organisation unit(s) to.

4. Click **Move x organisation units**, where x stands for the number of organisation units you have selected. Your changes are immediately reflected in the left-hand side hierarchy tree.

Close an organisation unit

When you close an organisation unit, you can't register or edit events to this organisation unit in the **Event Capture** and **Tracker Capture** apps.

1. Open the **Maintenance** app and click **Organisation unit** > **Organisation unit**.

2. In the object list, click the options menu and select **Edit**.

3. Select a **Closed date**.

4. Click **Save**.

Manage push reports

About push reports

Push reports allows you to increase awareness and usage of data analysis by sending reports with charts, tables and maps directly to users e-mail addresses.

1. A push report gets its content from existing dashboards.

2. A push report lists the dashboard items in the same order as on the dashboard.

3. A push report can only contain dashboard items with charts, maps or tables.

4. You create the push report and its schedule in the **Maintenance** app.

5. The **Title** and **Message** parameters you set up in the **Maintenance** app, are included in each report. The **Name** you give the report is not included in the report. Instead, the name is used to identify the push analysis object in the system. This way a report can be named one thing, and the title of the report can be another.

6. When you run a push report job, the system compiles a list of recipients from the user groups you've selected. The system then generates a report for each member of the selected user groups. Each of the dashboard items are generated specifically for each user. This means that the data included in the report reflects the data the user has access to. All users could therefore get the same report (if all the data is "static") or custom reports (if all the data is "dynamic"), or a combination of the two.

7. Push reports are sent by e-mail to the recipients, not through the internal DHIS2 messaging system. If a user doesn't have a valid e-mail, or if the job fails, no e-mails are sent. In this case, the problem is logged on the server.

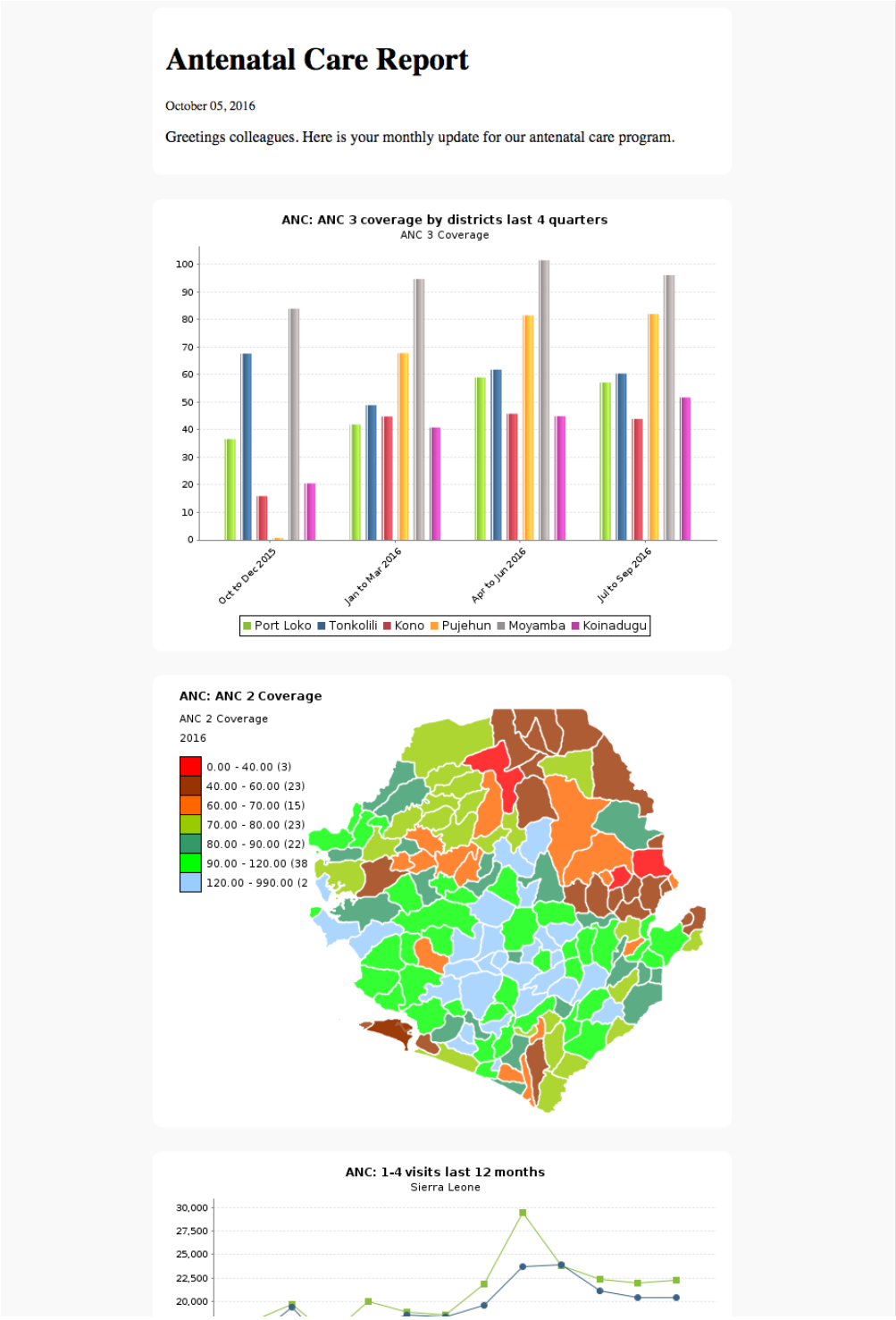
   Note

   The data generated in the push reports is public so verify that you don’t include any sensitive data.

Create or edit a push report

1. Open the **Maintenance** app and click **Other** > **Push analysis**.

2. Click the add button.



Object type	Available functions

Push analysis	Create, edit, clone, delete, show details, translate, preview and run

1. In the **Name** field, type the name of the scheduled report. This name is not included in the report e-mail. Instead, the name is used to identify the push analysis object in the system.
2. (Optional) In the **Code** field, assign a code.

3. Add a report **Title**. This title is included in the report e-mail.

4. (Optional) Add a **Message**. This message is included in the report e-mail.

5. Select a **Dashboard** to base the report on.

6. Select and assign the user groups you want to send the report to.

7. Select a **Scheduling frequency**: **Daily**, **Weekly** or **Monthly**.

Note If you schedule a push report to "Monthly" and "31", the scheduled report job will not run if the month has less than 31 days.

10(.Optional) Select **Enable** to activate the push report job. The job won't run until you activate it.

11 Click**Save**.

Preview push reports

1. Open the **Maintenance** app and click **Other** > **Push analysis**.

2. In the push report list, locate the push report you want to preview.

3. Click the options menu and select **Preview**.

A preview of the push report opens in a new window.

Run push report jobs

1. Open the **Maintenance** app and click **Other** > **Push analysis**.

2. In the push report list, locate the push report you want to run.

3. Click the options menu and select **Run now**.

The push report job runs immediately.

Clone metadata objects

Cloning a data element or other objects can save time when you create many similar objects.

1. Open the **Maintenance** app and find the type of metadata object you want to clone.

2. In the object list, click the options menu and select **Clone**.

3. Modify the options you want.

4. Click **Save**.

Delete metadata objects

You can only delete a data element and other data element objects if no data is associated to the data element itself.

Warning

Any data set that you delete from the system is irrevocably lost. All data entry forms, and section forms which may have been developed will also be removed. Make sure that you have made a backup of your database before deleting any data set in case you need to restore it at some point in time.

1. Open the **Maintenance** app and find the type of metadata object you want to delete.

2. In the object list, click the options menu and select **Delete**.

3. Click **Confirm**.

DHIS2 Mobile Introduction

DHIS2 provides a range of options to allow data entry from mobile devices, including a dedicated GPRS/3G J2ME client and two versions of DHIS2 which have been optimized specifically for mobile browsers. Each of these solutions will be described in detail in the following sections. DHIS2 offers several Android clients, which are described in detail in other sections of this guid.

Collection of data in the field can be technically challenging and expensive. Mobile phone solutions have the potential to significantly reduce the complexity of deploying a distributed data collection system. Using a simple Java client installed on a mobile phone or a web browser which works on the mobile phone, field workers can report directly to the DHIS2 database through their mobile device.

While mobile phone solutions have a great potential, there are complexities with such deployments. Phones lack processing power and have a small display, they need to be charged, and often such deployments make the most sense in areas with poor or intermittent network coverage.

Each of the mobile solutions are introduced briefly below, and the discussed in separate sections in detail:

1. DHIS2 Light: A mobile browser optimized data entry module for all devices This module allows for data entry directly with the browser of the mobile device. A wide range of devices and mobile browsers are supported including: Opera mini 3 & 4 (basic and advanced) - Opera mini 4, Nokia S40 mobiles ,Windows Phone 7, Window Mobile 6, Palm Pre, Blackberry (v5 and v6), Firefox mobile, iOS devices (iPhone) and Android devices. This client does not have offline-support, and an active GPRS/3G connection is required. It does not require a new application installation on the phone to support new features, but does require a stable data connection for use.

2.DHIS2 Smartphone client: A mobile browser optimized data entry module for Smartphone devices This module allows for data entry directly with the browser of a Smartphone. Offline data entry is supported and it does not require any installation of a special client on the phone itself.

3. J2ME GPRS/3G client DHIS-mobile includes two separate J2ME clients supporting GPRS/EDGE/3G as a transport mechanism. One clients supports facility aggregate reporting and the second client supports name-based program tracking. These clients are split into separate applications to make deployment easier. Some health workers may have both applications installed on their phone. Both of these clients support offline-storage of data and work on J2ME enabled devices (feature phones). An active GPRS/3G connection is required in order to send data to the DHIS2 database, but data can be entered offline and transmitted when a connection is present. This client is intended primarily for low-end devices which support J2ME applications, although the offline- supports adds some memory requirements which limits the handset selection. While the solution is primarily tested on Nokia phones, it also works on several other J2ME capable handsets.

The facility reporting J2ME client is described in the chapter "J2ME GPRS/3G Client"

DEVELOPED AND REVIEWED BY THE DHIMS2 TECHNICAL TEAM
POLICY PLANNING MONITORING AND EVALUATION DIVISION
CENTRE FOR HEALTH INFORMATION MANAGEMENT
INFORMTION MONITORING AND EVALUATION DEPARTMENT
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