Revision HEAD@0c7d1fb3

2018-11-05 10:29:13
Version 2.31

Warranty: THIS DOCUMENT IS PROVIDED BY THE AUTHORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHORS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS MANUAL AND PRODUCTS MENTIONED HEREIN, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

License: Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.3 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the source of this documentation, and is available here online: http://www.gnu.org/licenses/fdl.html.

-->
Table of Contents

About this guide ................................................................................................................................. ix
1. About demo server, live package and database design ................................................................. 1
    1.1. Using the DHIS2 demo server ............................................................................................... 1
    1.2. Using the DHIS2 live package ............................................................................................ 1
        1.2.1. Starting the DHIS2 Live package .............................................................................. 1
        1.2.1.1. Prerequisites for DHIS2 Live ........................................................................ 1
        1.2.1.2. Starting up with a blank database .................................................................. 1
        1.2.2. Downloading and installing the server version ...................................................... 2
    1.3. Logging on to DHIS2 .......................................................................................................... 2
    1.4. Logging out of DHIS2 ...................................................................................................... 2
    1.5. Quick intro to designing a DHIS2 database ........................................................................ 3
        1.5.1. The organisational hierarchy ................................................................................... 3
        1.5.2. Data Elements ......................................................................................................... 4
        1.5.3. Datasets and data entry forms .................................................................................. 5
            1.5.3.1. Data entry forms ............................................................................................ 5
        1.5.4. Validation rules ........................................................................................................ 6
        1.5.5. Indicators ................................................................................................................ 6
        1.5.6. Report tables and reports ....................................................................................... 6
        1.5.7. GIS ........................................................................................................................ 7
        1.5.8. Charts and dashboard .............................................................................................. 7
    2. Using the Data Entry app ........................................................................................................... 9
        2.1. About the Data Entry app ............................................................................................... 9
        2.2. Enter data in a data entry form ...................................................................................... 9
        2.3. Mark a data value for follow-up ................................................................................... 11
        2.4. Edit data values in a completed data entry form .......................................................... 11
        2.5. Display a data value’s history ..................................................................................... 12
        2.6. Display a data value’s audit trail .................................................................................. 12
        2.7. Create minimum maximum value range manually ...................................................... 13
        2.8. Enter data offline .......................................................................................................... 13
        2.9. Enable multi-organisation unit data entry ..................................................................... 14
        2.10. See also .................................................................................................................... 15
    3. Control data quality ................................................................................................................... 17
        3.1. About data quality checks ........................................................................................... 17
        3.2. Validation rule analysis ............................................................................................... 17
            3.2.1. About validation rule analysis ............................................................................. 17
            3.2.2. Workflow ........................................................................................................... 18
            3.2.3. Schedule a validation rule analysis to run automatically ................................ 18
            3.2.4. Run a validation rule analysis manually ............................................................ 19
            3.2.5. See also ............................................................................................................. 20
        3.3. Standard deviation outlier analysis ............................................................................... 20
            3.3.1. About standard deviation outlier analysis .......................................................... 20
            3.3.2. Run a standard deviation outlier analysis ........................................................... 20
            3.3.3. Modify a standard deviation outlier value ........................................................... 21
        3.4. Minimum maximum outlier analysis ............................................................................. 22
            3.4.1. About minimum maximum value based outlier analysis ..................................... 22
            3.4.2. Workflow ........................................................................................................... 22
            3.4.3. Configure a minimum maximum outlier analysis ............................................... 22
                3.4.3.1. Create minimum maximum value range automatically ............................................ 22
                3.4.3.2. Create minimum maximum value range manually ........................................... 23
                3.4.3.3. Delete minimum maximum value range ...................................................... 23
            3.4.4. Run a minimum maximum outlier analysis .......................................................... 24
        3.5. Follow-up analysis .......................................................................................................... 25
            3.5.1. About follow-up analysis ..................................................................................... 25
            3.5.2. Create list of data values marked for follow-up ...................................................... 25
4. Using reporting functionality .......................................................................................... 27
  4.1. Reporting functionality in DHIS2 ........................................................................ 27
  4.2. Using standard reports ....................................................................................... 27
  4.3. Using dataset reports ....................................................................................... 28
  4.4. Using resources ............................................................................................... 29
  4.5. Using reporting rate summary ......................................................................... 29
  4.6. Using organisation unit distribution reports .................................................... 30
  4.7. Generate analytics tables .................................................................................. 31
5. Analyze data in pivot tables ...................................................................................... 33
  5.1. About the Pivot Table app ................................................................................. 33
  5.2. Create a pivot table ........................................................................................... 33
    5.2.1. Select dimension items .............................................................................. 34
    5.2.2. Modify pivot table layout .......................................................................... 36
  5.3. Change the display of your pivot table .............................................................. 37
  5.4. Manage favorites ............................................................................................. 40
    5.4.1. Open a favorite ......................................................................................... 41
    5.4.2. Save a favorite ......................................................................................... 41
    5.4.3. Rename a favorite .................................................................................... 41
    5.4.4. Write an interpretation for a favorite ...................................................... 41
    5.4.5. Subscribe to a favorite ............................................................................. 41
    5.4.6. Create a link to a favorite ......................................................................... 41
    5.4.7. Delete a favorite ....................................................................................... 42
    5.4.8. View interpretations based on relative periods ....................................... 42
  5.5. Download data from a pivot table ..................................................................... 42
    5.5.1. Download table layout data format ......................................................... 42
    5.5.2. Download plain data source format .......................................................... 42
    5.5.3. Download a CSV format without rendering data in the web browser .... 43
  5.6. Embed a pivot table in an external web page ..................................................... 44
  5.7. Visualize pivot table data as a chart or a map .................................................... 44
    5.7.1. Open a pivot table as a chart ................................................................. 44
    5.7.2. Open a pivot table selection as a chart ................................................... 44
    5.7.3. Open a pivot table as a map .................................................................... 44
    5.7.4. Open a pivot table selection as a map .................................................... 45
  6. Using the Data Visualizer app .................................................................................. 47
  6.1. About the Data Visualizer app .......................................................................... 47
  6.2. Create a chart ..................................................................................................... 47
  6.3. Select a chart type .............................................................................................. 48
  6.4. Select dimension items ..................................................................................... 48
    6.4.1. Select indicators ....................................................................................... 49
    6.4.2. Select data elements ............................................................................... 49
    6.4.3. Select reporting rates ............................................................................... 49
    6.4.4. Select fixed and relative periods ............................................................. 49
    6.4.5. Select organisation units ......................................................................... 50
    6.4.6. Select additional dimension items ........................................................... 50
  6.5. Select series, category and filter ......................................................................... 51
  6.6. Change the display of your chart ...................................................................... 52
  6.7. Manage favorites .............................................................................................. 54
    6.7.1. Open a favorite ......................................................................................... 54
    6.7.2. Save a favorite ......................................................................................... 54
    6.7.3. Rename a favorite .................................................................................... 55
    6.7.4. Write an interpretation for a favorite ...................................................... 55
    6.7.5. Subscribe to a favorite ............................................................................. 55
    6.7.6. Create a link to a favorite ......................................................................... 55
    6.7.7. Delete a favorite ....................................................................................... 55
    6.7.8. View interpretations based on relative periods ....................................... 56
  6.8. Download a chart as an image or a PDF ............................................................ 56
  6.9. Download chart data source .............................................................................. 56
6.10. Embed charts in any web page ........................................................................ 57
6.11. Open a chart as a pivot table or as a map ..................................................... 57
7. Using the GIS app ................................................................................................ 59
7.1. About the GIS app ............................................................................................. 59
7.2. Create a new thematic map ............................................................................... 60
7.3. Manage event layers .......................................................................................... 60
  7.3.1. Create or modify event layer ........................................................................ 60
  7.3.2. Turn off cluster ............................................................................................ 61
  7.3.3. Modify cluster style .................................................................................... 62
  7.3.4. Modify information in event pop-up windows ............................................. 62
  7.3.5. Clear event layer ....................................................................................... 62
7.4. Manage facility layers ...................................................................................... 62
  7.4.1. Create or modify a facility layer ................................................................... 63
  7.4.2. Search for an organisation unit ................................................................. 63
  7.4.3. Clear facility layer ..................................................................................... 63
7.5. Manage facilities in a layer ............................................................................... 63
  7.5.1. Relocate a facility ...................................................................................... 64
  7.5.2. Swap longitude and latitude of a facility ................................................. 64
  7.5.3. Display facility information ....................................................................... 64
7.6. Manage thematic layers 1- 4 ........................................................................... 64
  7.6.1. Create or modify a thematic layer ............................................................... 65
  7.6.2. Filter values in a thematic layer .................................................................. 65
  7.6.3. Search for an organisation unit ................................................................. 66
  7.6.4. Navigate between organisation hierarchies .............................................. 66
  7.6.5. Clear thematic layer .................................................................................. 66
7.7. Manage boundary layers .................................................................................. 66
  7.7.1. Create or modify boundary layers ............................................................... 67
  7.7.2. Search for organisation units .................................................................... 67
  7.7.3. Navigate between organisation hierarchies .............................................. 67
  7.7.4. Clear boundary layer ................................................................................. 67
7.8. Manage Earth Engine layer ............................................................................. 68
  7.8.1. Create or modify an Earth Engine layer .................................................... 68
7.9. Add external map layers .................................................................................... 69
7.10. Manage map favorites .................................................................................... 71
  7.10.1. Save a map as a favorite ......................................................................... 71
  7.10.2. Open a favorite ....................................................................................... 71
  7.10.3. Rename a favorite .................................................................................. 71
  7.10.4. Overwrite a favorite ............................................................................... 72
  7.10.5. Share a map interpretation ...................................................................... 72
  7.10.6. Modify sharing settings for a favorite ..................................................... 72
  7.10.7. Delete a favorite ..................................................................................... 72
7.11. Save a map as an image .................................................................................. 73
7.12. Embed a map in an external web page ............................................................ 73
7.13. Search for a location ...................................................................................... 73
7.14. Measure distances and areas in a map ........................................................... 74
7.15. Get the latitude and longitude at any location ................................................. 74
7.16. View a map as a pivot table or chart ............................................................... 74
  7.16.1. Open a map as a chart .......................................................................... 74
  7.16.2. Open a map as a pivot table ................................................................... 74
7.17. See also .......................................................................................................... 74
8. Using the Maps app ............................................................................................ 75
8.1. About the Maps app ......................................................................................... 75
8.2. Create a new map ............................................................................................. 77
8.3. Manage event layers ....................................................................................... 78
  8.3.1. Create an event layer ............................................................................... 79
  8.3.2. Modify an event layer ............................................................................... 81
  8.3.3. Modify information in event pop-up windows ......................................... 81
9.3.1. Adding items to the dashboard ................................................................. 108
  9.3.1.1. Spacer items ..................................................................................... 109
9.3.2. Removing items ........................................................................................ 110
9.3.3. Saving the dashboard ............................................................................... 110
9.4. Editing an existing dashboard ....................................................................... 111
  9.4.1. Translating dashboard title and description ............................................ 111
  9.4.2. Deleting a dashboard ............................................................................. 111
9.5. Viewing a dashboard .................................................................................... 112
  9.5.1. Starred dashboards ............................................................................... 112
  9.5.2. Filtering a dashboard ............................................................................ 112
  9.5.3. Dashboard items with charts, pivot tables and maps .............................. 112
    9.5.3.1. Switching between visualizations ................................................... 112
  9.5.4. Interpretations ....................................................................................... 113
  9.5.5. Sharing a dashboard ............................................................................. 113
10. Messaging ......................................................................................................... 115
  10.1. About messages and feedback messages .................................................. 115
  10.2. Create a message .................................................................................... 117
  10.3. Read a message ....................................................................................... 119
  10.4. Create a feedback message ..................................................................... 120
  10.5. Attachments ............................................................................................ 120
  10.6. Manage validation and feedback messages .............................................. 120
  10.7. Configure feedback message function .................................................... 121
11. Set user account preferences .......................................................................... 123
About this guide

The DHIS2 documentation is a collective effort and has been developed by the development team and users. While the guide strives to be complete, there may be certain functionalities which have been omitted or which have yet to be documented. This section explains some of the conventions which are used throughout the document.

DHIS2 is a browser-based application. In many cases, screenshots have been included for enhanced clarity. Shortcuts to various functionalities are displayed such as Data element > Data element group. The "->" symbol indicates that you should click Data element and then click Data element group in the user interface.

Different styles of text have been used to highlight important parts of the text or particular types of text, such as source code. Each of the conventions used in the document are explained below.

Note

A note contains additional information which should be considered or a reference to more information which may be helpful.

Tip

A tip can be a useful piece of advice, such as how to perform a particular task more efficiently.

Important

Important information should not be ignored, and usually indicates something which is required by the application.

Caution

Information contained in these sections should be carefully considered, and if not heeded, could result in unexpected results in analysis, performance, or functionality.

Warning

Information contained in these sections, if not heeded, could result in permanent data loss or affect the overall usability of the system.

Program listings usually contain some type of computer code. They will be displayed with a shaded background and a different font.

Commands will be displayed in bold text, and represent a command which would need to be executed on the operating system or database.

Links to external web sites or cross references will be displayed in blue text, and underlined like this.

Bibliographic references will displayed in square brackets like this [Store2007]. A full reference can be found in the bibliography contained at the end of this document.
Chapter 1. About demo server, live package and database design

1.1. Using the DHIS2 demo server

The DHIS2 team maintains a demonstration server at https://play.dhis2.org/demo. This is by far the easiest way to try out DHIS2. Simply open the link in your web browser and login with username = admin and password = district.

Note

All changes on this server are deleted each night, so do not save any important work on this server. It is strictly for demonstration purposes on only!

1.2. Using the DHIS2 live package

1.2.1. Starting the DHIS2 Live package

The DHIS2 Live package is the easiest way to get started with DHIS2 on your local computer. DHIS2 Live is appropriate for a stand-alone installation and demos. Simply download the application from here. Once the file is downloaded, you can simply double-click the downloaded file, and get started using DHIS2.

1.2.1.1. Prerequisites for DHIS2 Live

You must be sure that you have a current version of the Java Runtime installed on your machine. Depending on your operating system, there are different ways of installing Java. The reader is referred to this website for detailed information on getting Java installed.

1.2.1.2. Starting up with a blank database

The live package comes with a demo database just like what you see on the online demo (which is based on the national Sierra Leone HMIS), and if you want to start with a blank system/database and build up your own system then you need to do the following:

1) Stop DHIS2 live if it is already running. Right click on the tray icon and select Exit. The tray icon is the green symbol on the bottom right of your screen (on Windows) which should say 'DHIS2 Server running' when you hover your mouse pointer over the icon.

2) Open the folder where the DHIS2 live package is installed and locate the folder called "conf".

3) In conf/ open the file called 'hibernate.properties' in a text editor (notepad or similar) and do the following modification: locate the string 'jdbc:h2:./database/dhis2' and replace the 'dhis2' part with any name that you want to give to your database (e.g. dhis2_test).

4) Save and close the hibernate.properties file.

5) Start DHIS2 Live by double-clicking on the file dhis2-live.exe in the DHIS2 Live installation folder or by using a desktop shortcut or menu link that you might have set up.

6) Wait for the browser window to open and the login screen to show, and then log in with username: admin and password: district
7) Now you will see a completely empty DHIS2 system and you should start by adding your users, organisational hierarchy, data elements, and datasets etc. Please refer to the other sections of the user manual for instructions on how to do this.

1.2.2. Downloading and installing the server version

The latest stable server version can be downloaded from this [website](#). For detailed information on how to install it please refer to the installation chapter in the implementation manual.

1.3. Logging on to DHIS2

Regardless of whether you have installed the server version of the desktop Live version, you will use a web-browser to log on to the application. DHIS2 should be compatible with most modern web-browsers, although you will need to ensure that Java Script is enabled.

To log on to the application just enter [http://localhost:8080/dhis](http://localhost:8080/dhis) if you are using the DHIS2 live package, or replace localhost with the name or IP address of the server where the server version is installed.

Once you have started DHIS2, either on-line or off-line, the displayed screen will prompt you to enter your registered user-name and password. After entering the required information click on log-in button to log into the application. The default user name and password are 'admin' and 'district'. They should be changed immediately upon logging on the first time.

You can select the language which you wish to display DHIS2 in from the "Change language" dialog box at the bottom of the screen. Not all languages may be available.

Should you have forgotten your password, you can click on the "Forgot password?" link. You must have informed DHIS2 of your email address and the server must be properly configured to send emails.

If you want to create your own account (and the server administrator allows this), simply click "Create an account" and follow the directions provided.

Once you have logged into DHIS2, refer to the specific sections in this manual for the different functionality which is available.

1.4. Logging out of DHIS2

Just click on the Profile and the click "Log out" the top-right corner of the DHIS2 menu.
1.5. Quick intro to designing a DHIS2 database

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 to be created in the DHIS2 database before it can be used. This can be done through the user interface and requires no programming or in-depth technical skills of the software, but does 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:

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

1.5.1. 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, e.g. having one or
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 a province) 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.

1.5.2. 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.

1.5.3. 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.

1.5.3.1. 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.

1.5.3.1.1. 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 in 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.

1.5.3.1.2. 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.

1.5.4. 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.

1.5.5. 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.

1.5.6. 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.
1.5.7. 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.

1.5.8. Charts and dashboard

One 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.
Chapter 2. Using the Data Entry app

2.1. 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.

2.2. 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**.

   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**.

5. 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.

6. 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.

   ![Validation](image)

7. (Optional) Correct validation violations.

   **Note**

   Zero (0) will delete the value if the data element has been configured to not store zeros.

8. 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.
2.3. 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.

2.4. 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.

Note

Zero (0) will delete the value if the data element has been configured to not store zeros,

5. Click Complete.
2.5. 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**.

2.6. 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**.
2.7. Create minimum maximum value range manually

1. In the Data Entry app, open a data entry form.
2. Double-click the field for which you want to set the minimum maximum value range.
3. Enter **Min limit** and **Max limit**.
4. Click **Save**.

   If values don't fall within the new value range the next time you enter data, the data entry cell will appear with an orange background.
5. (Optional) Type a comment to explain the reason for the discrepancy, for example an event at a facility which may have generated a large number of clients.
6. (Optional) Click **Save comment**.

   **Tip**

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

2.8. 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:

   ![You are online](image)

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

   ![You are offline, data will be stored locally](image)
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:

  ![dhis2](image)

  **dhis2**
  
  There is data stored locally, please upload to server
  
  **Upload**

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

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

  ![dhis2](image)

  **dhis2**
  
  Upload to Server was Successful

### 2.9. 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.
2.10. See also

- Control data quality
- Manage data sets and data entry forms
- Using the Maintenance app
Chapter 3. Control data quality

3.1. 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:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correctness</td>
<td>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.</td>
</tr>
<tr>
<td>Completeness</td>
<td>Data for all data elements for all reporting organisation units should have been submitted.</td>
</tr>
<tr>
<td>Consistency</td>
<td>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.</td>
</tr>
<tr>
<td>Timeliness</td>
<td>All data from all reporting organisation units should be submitted at the appointed time.</td>
</tr>
</tbody>
</table>

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

• 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).

• 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.

• By analysing data sets, that is, examine gaps in the data.

• By data triangulation, that is, comparing the same data or indicator from different sources.

3.2. Validation rule analysis

3.2.1. 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 3.1.**

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

3.2.2. Workflow

1. In the Maintenance app, create validation rules and validation rule groups.
2. (Optional) In the Maintenance app, create validation notifications.
3. 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).

3.2.3. 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.

Note

While running validation rule analysis automatically, any results not already persisted, will be persisted during this run. Persisted results can currently only be accessed trough the api.

1. Verify that you have created all the validation rules, validation rule groups and validation notifications you need.
2. Open the Data Administration app and click Scheduling.
3. If scheduling is active, click Stop.
4. In the Data monitoring section, select All daily.
5. Click Start.
3.2.4. 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.
6. (Optional) Select Persist new results to persist any non-persisted results found during the analysis.
7. Select a Parent organisation unit.
8. 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.

9. (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.

10(Optional) Click Download as PDF, Download as Excel or Download as CSV to download the validation violations list in PDF, Excel or CSV formats.

3.2.5. See also

- Manage validation rules
- Data Administration app

3.3. Standard deviation outlier analysis

3.3.1. About standard deviation outlier analysis

The standard deviation outlier analysis identifies values that are numerically distant from the rest of the data. The analysis is based on the standard normal distribution. The system calculates the average, based on values since the beginning of time, for one particular combination of organisation unit, data element, category option combination and attribute option combination. Outliers can occur by chance but often indicate a measurement error or a heavy-tailed distribution which leads to very high numbers. You should investigate measurement errors and try to correct them before you discard them from the analysis.

⚠️ Warning

It's not recommended to use tools or interpretations that assume a normal distribution for heavy-tailed distributions.

For example: the standard deviation outlier analysis is not an appropriate tool when you expect huge seasonal variations in the data.

3.3.2. Run a standard deviation outlier analysis

1. Open the Data Quality app and click Std dev outlier analysis.
2. Select **From date** and **To date**.
3. Select data set(s).
4. Select **Parent organisation unit**.

All children of the organisation unit will be included. The analysis is made on raw data "under" the parent organisation unit, not on aggregated data.

5. Select a number of standard deviations.

This refers to the number of standard deviations the data is allowed to deviate from the mean before it is classified as an outlier.

6. Click **Start**.

The analysis process duration depends on the amount of data that is being analysed. If there are standard deviations outliers, they will be presented in a list.

For each outlier, you'll see the data element, organisation unit, period, minimum value, actual value and maximum value. The minimum and maximum values refer to the border values derived from the number of standard deviations selected for the analysis.

![Std Dev Outlier Analysis](image)

### Tip

Click the star icon to mark an outlier value for further follow-up.

#### 3.3.3. Modify a standard deviation outlier value

You can modify an outlier value directly in the analysis result list:

1. In the value column, click inside the field that contains the value you want to change.
2. Enter a value and then navigate away from that field either by clicking tab or anywhere outside the field.

The system provides an alert if the value is still outside the defined minimum and maximum values, but the value will be saved in any case. The field will have a red background color if the value is outside the range, and a green if inside.
3.4. Minimum maximum outlier analysis

3.4.1. About minimum maximum value based outlier analysis

You can verify the data quality at the point of data entry by setting a minimum maximum value range for each data element. You create the value ranges manually or generate them automatically.

The auto-generated minimum maximum value range is suitable only for normally distributed data. DHIS2 will determine the arithmetic mean and standard deviation of all values for a given data element, category option, organisation unit and attribute combination. Then the system will calculate the minimum maximum value range based on the Data analysis std dev factor specified in the System Settings app.

For data which is highly-skewed or zero inflated (as is often the case with aggregate data), the values which DHIS2 auto-generates may not provide an accurate minimum maximum value range. This can lead to excessive false violations, for example if you analyse values related to seasonal diseases.

Note

Minimum maximum value ranges are calculated across all attribute combination options for a given data element, category option and organisation unit combination.

3.4.2. Workflow

1. Create a minimum maximum value range, either automatically or manually.
   • In the Data Administration app, you generate value ranges automatically.
   • In the Data Entry app, you set value ranges manually for each field.
2. In the Data Quality app, run the Min-max outlier analysis.

3.4.3. Configure a minimum maximum outlier analysis

3.4.3.1. Create minimum maximum value range automatically

Note

Auto-generated minimum maximum value ranges can be useful for many situations, but it’s recommended to verify that the data is actually normally distributed prior to using this function.

You generate minimum maximum value ranges calculated by data set in the Data Administration app. The new value ranges override any value ranges that the system has calculated previously.

1. Set the Data analysis std dev factor:
   a. Open the System Settings app, and click General.
- Control data quality

- Configure a minimum maximum outlier analysis

b. In the **Data analysis std dev factor** field, enter a value.

This sets the number of standard deviations to use in the outlier analysis. The default value is 2. A high value will catch less outlier values than a low value.

2. Open the **Data Administration** app and click **Min-max value generation**.
3. Select data set(s).
4. Select an **Organisation unit**.
5. Click **Generate**.

New minimum maximum value ranges for all data elements in the selected data sets for all organisation units (including descendants) of the selected organisation units are generated.

### 3.4.3.2. Create minimum maximum value range manually

1. In the **Data Entry** app, open a data entry form.
2. Double-click the field for which you want to set the minimum maximum value range.
3. Enter **Min limit** and **Max limit**.
4. Click **Save**.

If values don't fall within the new value range the next time you enter data, the data entry cell will appear with an orange background.

5. (Optional) Type a comment to explain the reason for the discrepancy, for example an event at a facility which may have generated a large number of clients.
6. (Optional) Click **Save comment**.

**Tip**

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

### 3.4.3.3. Delete minimum maximum value range

You can permanently delete all minimum maximum value ranges for selected data sets and organisation units in the **Data Administration** app.

1. Open the **Data Administration** app and click **Min-max value generation**.
2. Select data set(s).
3. Select an **Organisation unit**.
4. Click **Remove**.

### 3.4.4. Run a minimum maximum outlier analysis

1. Verify that you’ve created minimum maximum value ranges.
2. Open the **Data Quality** app and click **Min-max outlier analysis**.
3. Select **From date** and **To date**.
4. Select which data set(s) you want to include in the analysis.
5. Select **Parent organisation unit**.

   All children of the organisation unit will be included. The analysis is made on raw data "under" the parent organisation unit, not on aggregated data.

6. Click **Start**.

   The analysis process duration depends on the amount of data that is being analysed. If there are validation violations, they will be presented in a list.

7. (Optional) Click **Download as PDF, Download as Excel** or **Download as CSV** to download the list in PDF, Excel or CSV formats.
3.5. Follow-up analysis

3.5.1. About follow-up analysis

The follow-up analysis creates a list of all data values marked for follow-up. You can mark a data value for follow-up in the Data Entry app and in the result list you get from a standard deviation outlier or minimum maximum outlier analysis.

3.5.2. Create list of data values marked for follow-up

1. Open the Data Quality app and click Follow-up analysis.
2. Select an Organisation unit.

The analysis process duration depends on the amount of data that is being analysed. If there are data values marked for follow-up, they will be presented in a list.

3. (Optional) Click Download as PDF, Download as Excel or Download as CSV to download the validation violations list in PDF, Excel or CSV formats.

Tip

Click the star icon to remove the follow-up tag from the data value.
Chapter 4. Using reporting functionality

4.1. 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.

4.2. Using standard reports

You access the available reports by navigating to Apps->Reports. In the report menu in the left bar, click Standard Report. A list of all pre-defined reports will appear in the main window.
**Standard reports**

You run/view a report by clicking on the name of the report and then selecting "Create" from the contextual menu. If there are any pre-defined parameters, you will see a report parameter window where you must fill in the values needed for orgunit and/or reporting month, depending on what has been defined in the underlying report table(s). Click on "Get Report" when you are ready. The report will either appear directly in your browser or be available as a PDF file for download, depending on your browser settings for handling PDF files. You can save the file and keep it locally on your computer for later use.

4.3. 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 dataset 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.
4.4. 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.

4.5. 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.
4.6. 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. The select the orgunit group set that you want to use, typically these are Type, Ownership, Rural/Urban, but can be any user-defined orgunit group set. The 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.

**Orgunit distribution report**
4.7. Generate analytics tables

DHIS2 generates database tables which the system then uses as basis for various analytics functions. These tables are also valuable if you write advanced SQL reports. In the Reports app, you can execute the tables immediately or schedule them to be executed at regular intervals. This means that you can refresh recent analytics on demand and see updated pivot tables without waiting for all of the past years data to re-process.

Note

You can also generate the tables through the web API. This task is typically performed by a system administrator.

1. Open the Reports app and click Analytics.
2. Select the parts of the analytics process you want to skip:
   - Skip generation of resource tables
   - Skip generation of aggregate data and completeness data
   - Skip generation of event data
   - Skip generation of enrollment data
3. Select Number of last years of data to include.
4. Click Start export.
Chapter 5. Analyze data in pivot tables

5.1. 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. You will be prompted with a warning if your requested table exceeds a particular size. From this prompt, you can either cancel the request or continue building the table. 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.

5.2. 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 5.1. Example pivot table with data elements as columns and periods as rows.**

In this example, indicators are listed as columns and periods as rows.
5.2.1. 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

<table>
<thead>
<tr>
<th>Data dimension type</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicators</td>
<td>An indicator is a calculated formula based on data elements.</td>
<td>Coverage of immunization across a specific district.</td>
</tr>
<tr>
<td>Data elements</td>
<td>Represents the phenomenon for which data has been captured.</td>
<td>Number of malaria cases; number of BCG doses given.</td>
</tr>
</tbody>
</table>
| Data sets           | A collection of data elements grouped for data collection. You can select:  
• **Reporting rates**: the percentage of actual 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 | Reporting rates for immunization and morbidity forms. |
## Data dimension type

<table>
<thead>
<tr>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>within a number of days after the reporting period.</td>
<td>Average weight and height for children in a nutrition program.</td>
</tr>
<tr>
<td><strong>Expected reports</strong>: the number of expected reports based on organisation units where the data set and the reporting frequency has been assigned.</td>
<td>Average BMI score for children in a nutrition program.</td>
</tr>
</tbody>
</table>

### Event data items

A data element that is part of a program representing events that have been captured.

### Program indicators

A calculated formula based on data elements in a program representing events.

---

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 checkboxes next to each period. The main advantage of using relative periods is that when you save a pivot table favorite, it will stay updated with the latest data as time goes by without the need for constantly updating it.

For the organisation unit dimension 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 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.

5.2.2. 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.**

5.3. 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. Set the options as required.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Show column totals</strong></td>
<td>Displays total values in the table for each row and column, as well as a total for all values in the table.</td>
</tr>
<tr>
<td><strong>Show row totals</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Show column sub-totals</strong></td>
<td>Displays subtotals in the table for each dimension.</td>
</tr>
<tr>
<td><strong>Show row sub-totals</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Show dimension labels</strong></td>
<td>Shows the dimension names as part of the pivot tables.</td>
</tr>
<tr>
<td><strong>Hide empty rows</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Hide empty columns</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Skip rounding</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Aggregation type</strong></td>
<td>The default aggregation operator can be over-ridden here, by selecting a different aggregation operator. Some of the aggregation types are <em>Count</em>, <em>Min</em> and <em>Max</em>.</td>
</tr>
<tr>
<td><strong>Number type</strong></td>
<td>Sets the type of value you want to display in the pivot table: <em>Value</em>, <em>Percentage of row</em> or <em>Percentage of column</em>.</td>
</tr>
<tr>
<td></td>
<td>The options <strong>Percentage of row</strong> and <strong>Percentage of column</strong> 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,</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Measure criteria</strong></td>
<td>Allows for the data to be filtered on the server side.</td>
</tr>
<tr>
<td><strong>Events</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Include only completed events</strong></td>
<td>Includes only completed events in the aggregation process. This is useful for example to exclude partial events in indicator calculations.</td>
</tr>
<tr>
<td><strong>Organisation units</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Show hierarchy</strong></td>
<td>Shows the name of all ancestors for organisation units, for example &quot;Sierra Leone / Bombali / Tamabaka / Sanya CHP&quot; for Sanya 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 <strong>Show hierarchy</strong>, 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.</td>
</tr>
<tr>
<td><strong>Legend</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Apply legend</strong></td>
<td>Applies a legend to the values. This mean that you can apply a colour to the values. Select <strong>By data item</strong> to color the table cells individually according to each data element or indicator. You configure legends in the <strong>Maintenance</strong> app.</td>
</tr>
<tr>
<td><strong>Style</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Colors the text or background of cells in pivot tables based on the selected legend.</td>
</tr>
</tbody>
</table>
### Option

<table>
<thead>
<tr>
<th><strong>Style</strong></th>
<th><strong>Display density</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>You can use this option for scorecards to identify high and low values at a glance.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Font size</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Controls the size of the table text font. You can set it to Large, Normal or Small.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Digit group separator</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Controls which character to separate groups of digits or &quot;thousands&quot;. You can set it to Comma, Space or None.</td>
</tr>
</tbody>
</table>

### General

<table>
<thead>
<tr>
<th><strong>Table title</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type a title here to display it above the table.</td>
</tr>
</tbody>
</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.

<table>
<thead>
<tr>
<th><strong>Reporting period</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Controls whether to ask user to enter a report period.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Organisation unit</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Controls whether to ask user to enter an organisation unit.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Parent organisation unit</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Controls whether to ask user to enter a parent organisation unit.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Include regression</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Includes a column with regression values to the pivot table.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Include cumulative</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Includes a column with cumulative values to the pivot table.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Sort order</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Controls the sort order of the values.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Top limit</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Controls the maximum number of rows to include in the pivot table.</td>
</tr>
</tbody>
</table>

5. Click **Update**.

### 5.4. 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.
5.4.1. 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.

5.4.2. Save a favorite
1. Click **Favorites > Save as**.
2. Enter a **Name** and a **Description** for your favorite.
3. Click **Save**.

5.4.3. Rename a favorite
1. Click **Favorites > Rename**.
2. Enter the new name for your favorite.
3. Click **Update**.

5.4.4. 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 also mention other users with '@username'. Start by typing '@' plus the first letters of the username or real name and a mentioning bar will display the available users. Mentioned users will receive an internal DHIS2 message with the interpretation or comment. You can see the interpretation 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.
   - **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**.
5. Click **Share**.

5.4.5. Subscribe to a favorite
When you are subscribed to a favorite, you receive internal messages whenever another user likes/creates/updates an interpretation or creates/update an interpretation comment of this favorite.
1. Open a favorite.
2. Click >>> in the top right of the workspace.
3. Click on the upper-right bell icon to subscribe to this favorite.

5.4.6. 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".

5.4.7. Delete a favorite
1. Click **Favorites > Delete**.
2. Click **OK**.

5.4.8. 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.

5.5. Download data from a pivot table

5.5.1. Download table layout data format
To download the data in the current pivot table:
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.

5.5.2. 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

<table>
<thead>
<tr>
<th>Format</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSON</td>
<td>Click JSON</td>
<td>Downloads JSON format based on ID property. You can also download JSON format based on Code or Name property.</td>
</tr>
<tr>
<td>XML</td>
<td>Click XML</td>
<td>Downloads XML format based on ID property. You can also download XML format based on Code or Name property.</td>
</tr>
<tr>
<td>Microsoft Excel</td>
<td>Click Microsoft Excel</td>
<td>Downloads XML format based on ID property. You can also download Microsoft Excel format based on Code or Name property.</td>
</tr>
<tr>
<td>CSV</td>
<td>Click CSV</td>
<td>Downloads CSV format based on ID property. You can also download CSV format based on Code or Name property.</td>
</tr>
<tr>
<td>JRXML</td>
<td>Put the cursor on Advanced and click JRXML</td>
<td>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 DHIS2.</td>
</tr>
<tr>
<td>Raw data SQL</td>
<td>Put the cursor on Advanced and click Raw data SQL</td>
<td>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.</td>
</tr>
</tbody>
</table>

### 5.5.3. 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.
5.6. 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.

5.7. 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.

5.7.1. Open a pivot table as a chart

1. Click **Chart > Open this table as chart**.

Your current pivot table opens as a chart.

5.7.2. 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.

![Table with values and icons for chart and map options]

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**.

5.7.3. Open a pivot table as a map

1. Click **Chart > Open this table as map**

Your current pivot table opens as a map.
5.7.4. 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.
Chapter 6. Using the Data Visualizer app

6.1. 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

- 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.
- 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.

6.2. 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.
6.3. Select a chart type

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

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

<table>
<thead>
<tr>
<th>Chart type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column chart</td>
<td>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.</td>
</tr>
<tr>
<td>Stacked column chart</td>
<td>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.</td>
</tr>
<tr>
<td>Bar chart</td>
<td>Same as column chart, only with horizontal bars.</td>
</tr>
<tr>
<td>Stacked bar chart</td>
<td>Same as stacked column chart, only with horizontal bars.</td>
</tr>
<tr>
<td>Line chart</td>
<td>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.</td>
</tr>
<tr>
<td>Area chart</td>
<td>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.</td>
</tr>
<tr>
<td>Pie chart</td>
<td>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.</td>
</tr>
<tr>
<td>Radar chart</td>
<td>Displays data on axes starting from the same point. Also known as spider chart.</td>
</tr>
<tr>
<td>Speedometer chart</td>
<td>Semi-circle chart which displays values out of 100 %. Also referred to as a gauge chart.</td>
</tr>
</tbody>
</table>

2. Click Update.

6.4. 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:

- Double-click a dimension item name.
- Highlight one or several dimension items and click the single-arrow.
- To select all dimension items in a list, click the double-arrow.
- To clear dimension items, use the arrows or double-click the names in the Selected list.

6.4.1. 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.

6.4.2. 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.

6.4.3. 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.

6.4.4. 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.

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

• 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.

### 6.4.5. Select organisation units

1. Click **Organisation units**.
2. Click the gearbox icon.
3. Select a **Selection mode** and an organisation unit.

There are three different selection modes:

<table>
<thead>
<tr>
<th>Selection mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Select organisation units</strong></td>
<td>Lets you select the organisation units you want to appear in the chart from the organization tree.</td>
</tr>
<tr>
<td></td>
<td>Select <strong>User org unit</strong> to disable the organisation unit tree and only select the organisation unit that is related to your profile.</td>
</tr>
<tr>
<td></td>
<td>Select <strong>User sub-units</strong> to disable the organisation unit tree and only select the sub-units of the organisation unit that is related to your profile.</td>
</tr>
<tr>
<td></td>
<td>Select <strong>User sub-x2-units</strong> to disable the organisation unit tree and only select organisation units two levels down from the organisation unit that is related to your profile.</td>
</tr>
<tr>
<td></td>
<td>This functionality is useful for administrators to create a meaningful &quot;system&quot; favorite. With this option checked all users find their respective organisation unit when they open the favorite.</td>
</tr>
<tr>
<td><strong>Select levels</strong></td>
<td>Lets you select all organisation units at one or more levels, for example national or district level.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Select groups</strong></td>
<td>Lets you select all organisation units inside one or several groups and parent organisation units at the same time, for example hospitals or chiefdoms.</td>
</tr>
</tbody>
</table>

4. Click **Update**.

### 6.4.6. 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.

### 6.5. 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.

6.6. Change the display of your chart

1. Click **Options**.
2. Set the options as required.

**Table 6.3. Chart options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data</strong></td>
<td><strong>Show values</strong></td>
</tr>
<tr>
<td></td>
<td>Shows the values above the series in the chart.</td>
</tr>
<tr>
<td>Use 100% stacked</td>
<td>Displays 100 % stacked values in column charts.</td>
</tr>
<tr>
<td>values</td>
<td></td>
</tr>
<tr>
<td>Use cumulative values</td>
<td>Displays cumulative values in line charts.</td>
</tr>
<tr>
<td>Hide empty categories</td>
<td>Hides the category items with no data from the chart.</td>
</tr>
<tr>
<td></td>
<td><strong>None</strong>: doesn't hide any of the empty categories</td>
</tr>
<tr>
<td></td>
<td><strong>Before first</strong>: hides missing values only before the first value</td>
</tr>
</tbody>
</table>
### Option

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>After last: hides missing values only after the last value</td>
</tr>
<tr>
<td>Before first and after last: hides missing values only before the first value and after the last value</td>
</tr>
<tr>
<td>All: hides all missing values</td>
</tr>
<tr>
<td>This is useful for example when you create column and bar charts.</td>
</tr>
</tbody>
</table>

### Option

<table>
<thead>
<tr>
<th>Trend line</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

### Option

<table>
<thead>
<tr>
<th>Target line value/title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays a horizontal line at the given domain value. Useful for example when you want to compare your performance to the current target.</td>
</tr>
</tbody>
</table>

### Option

<table>
<thead>
<tr>
<th>Base line value/title</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

### Option

<table>
<thead>
<tr>
<th>Sort order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allows you to sort the values on your chart from either low to high or high to low.</td>
</tr>
</tbody>
</table>

### Option

<table>
<thead>
<tr>
<th>Aggregation type</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

### Option

<table>
<thead>
<tr>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>Include only completed events</td>
</tr>
<tr>
<td>Includes only completed events in the aggregation process. This is useful when you want for example to exclude partial events in indicator calculations.</td>
</tr>
</tbody>
</table>

### Option

<table>
<thead>
<tr>
<th>Axes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range axis min/max</td>
</tr>
<tr>
<td>Defines the maximum and minimum value which will be visible on the range axis.</td>
</tr>
<tr>
<td>Range axis tick steps</td>
</tr>
<tr>
<td>Defines the number of ticks which will be visible on the range axis.</td>
</tr>
<tr>
<td>Range axis decimals</td>
</tr>
<tr>
<td>Defines the number of decimals which will be used for range axis values.</td>
</tr>
</tbody>
</table>

### Option

<table>
<thead>
<tr>
<th>Range axis title</th>
</tr>
</thead>
</table>
| Type a title here to display a label next to the range axis (also referred to as the Y axis). Useful when you 
### Option | Description
--- | ---
**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.

| **Style** | **No space between columns/bars** | Removes the space between the columns or bars in the chart. Useful for displaying the chart as an EPI curve.

| **General** | **Hide chart legend** | Hides the legend and leaves more room for the chart itself.

| **General** | **Hide chart title** | Hides the title (default or custom) of your chart.

| **General** | **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.

| **General** | **Hide chart subtitle** | Hides the subtitle of your chart.

| **General** | **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.

3. Click **Update**.

### 6.7. 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.

### 6.7.1. 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.

### 6.7.2. Save a favorite

1. Click **Favorites > Save as**.
2. Enter a **Name** and a **Description** for your favorite.
3. Click **Save**.
6.7.3. Rename a favorite

1. Click **Favorites > Rename**.
2. Enter the new name for your favorite.
3. Click **Update**.

6.7.4. 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 also mention other users with '@username'. Start by typing '@' plus the first letters of the username or real name and a mentioning bar will display the available users. Mentioned users will receive an internal DHIS2 message with the interpretation or comment. You can see the interpretation 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.
   - **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**.
5. Click **Share**.

6.7.5. Subscribe to a favorite

When you are subscribed to a favorite, you receive internal messages whenever another user likes/creates/updates an interpretation or creates/update an interpretation comment of this favorite.

1. Open a favorite.
2. Click ‘>>>’ in the top right of the workspace.
3. Click on the upper-right bell icon to subscribe to this favorite.

6.7.6. 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".

6.7.7. Delete a favorite

1. Click **Favorites > Delete**.
2. Click **OK**.
6.7.8. 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.

6.8. 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.

6.9. Download chart data source

You can download the data source behind a chart in JSON, XML, Excel, CSV, JRXML 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>
<thead>
<tr>
<th>Table 6.4. Available formats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format</td>
</tr>
<tr>
<td>JSON</td>
</tr>
<tr>
<td>XML</td>
</tr>
<tr>
<td>Microsoft Excel</td>
</tr>
<tr>
<td>CSV</td>
</tr>
</tbody>
</table>
### 6.10. 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**.

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

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

### 6.11. Open a chart as a pivot table or as a map

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

---

<table>
<thead>
<tr>
<th>Format</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JRXML</td>
<td>Put the cursor on <strong>Advanced</strong> and click <strong>JRXML</strong></td>
<td>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.</td>
</tr>
<tr>
<td>Raw data SQL</td>
<td>Put the cursor on <strong>Advanced</strong> and click <strong>Raw data SQL</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>
Chapter 7. Using the GIS app

7.1. 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

- The icons in the top left of the workspace represent the map layers. They are the starting point of the GIS app.
- The panel on the right side of the workspace shows an overview of the layers:
  - 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.
  - If you want to increase or reduce the opacity of a layer, use the up and down arrows for the selected layer.
  - Use the map legends when you create a thematic map. A legend explains the link between values and colors on your map.
  - Zoom to content automatically adjusts the zoom level and map center position to put the data on your map in focus.
  - To view information for an event, simply click the event.
  - Right-click to display the longitude and latitude of the map.

7.2. Create a new thematic map

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

### 7.3. 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**

![Event layer screenshot](image)

#### 7.3.1. Create or modify event layer

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

2. Click **Edit layer**.

3. 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.

4. Select any data element or attribute from this list as part of your query.
Using the GIS app

- 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.
   - Fixed period: In the **Period** field, select **Start/end dates** and fill in a start date and an end date.
   - 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:
   - 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.
   - Select or clear **Clustering** to group nearby events.
   - Go to **Style** to select a color for the cluster points or change the radius of clusters (between 1 and 20).

8. Click **Update**.

#### 7.3.2. 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**.
4. Clear Group nearby events check box.
5. Click Update.

7.3.3. 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.

7.3.4. Modify information in event pop-up windows

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.

7.3.5. Clear event layer

To clear all data in a map:
1. In the top menu, click the event layer icon.
2. Click Clear.

7.4. 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.
7.4.1. 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**.

7.4.2. 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.

7.4.3. Clear facility layer

To clear all data in a facility layer:

1. In the top menu, click the facility layer icon.
2. Click **Clear**.

7.5. Manage facilities in a layer

You can have facilities in **Facility**, **Boundary** and **Thematic** layers.
7.5.1. 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.

7.5.2. 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.

7.5.3. Display facility information

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

**Table 7.1. View organisation unit information**

<table>
<thead>
<tr>
<th>Function</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>View information for the current period</td>
<td>1. Click a facility.</td>
</tr>
<tr>
<td>View information for a selected period</td>
<td>1. Right-click a facility and click <strong>Show information</strong>.</td>
</tr>
<tr>
<td></td>
<td>2. In the <strong>Infrastructural data</strong> section, select a period.</td>
</tr>
</tbody>
</table>

**Note**

You configure the displayed infrastructural data in the **System Settings** app.

7.6. 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.
7.6.1. 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.
   - 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.
   - 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. See also **Aggregation operators**.
8. Click **Update**.

7.6.2. 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**.

### 7.6.3. 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**.

   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.

### 7.6.4. 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.

### 7.6.5. 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**.

### 7.7. 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**
7.7.1. 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**.

7.7.2. 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.

7.7.3. 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.

7.7.4. Clear boundary layer

To clear data in a boundary layer:

1. In the top menu, click the boundary layer icon.
2. Click **Clear**.
### 7.8. 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:

- **Elevation**: Metres above sea level
- **Nighttime lights**: Lights from cities, towns, and other sites with persistent lighting, including gas flares (from 2013)
- **Population density**: Population in 100 x 100 m grid cells (from 2010)
- **Temperature, population and land cover at any location.**

Right-click on the layers to view more information, for example temperature and elevation.

#### 7.8.1. 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**.

### 7.9. Add external map layers

1. In the top menu, click the **External layer** icon.

2. Click **Edit** to add a new layer.

3. Select a layer from the list.

![External layer selection](image)

4. 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**

![First-order administrative boundaries](image)
Example 2: Aerial imagery of Dar-es-Salaam

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

Example 4: World time zones

Note

To define external map layers, see the Maintenance app documentation.
7.10. 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.

7.10.1. Save a map as a favorite

When you have created a map it is convenient to save it as a favorite:
1. Click Favorites.
   The Manage favorites dialog box opens.
2. Click Add new.
   The Create new favorite dialog box opens.
3. In the text field, type the name you want to give your pivot table.
4. Click Create.
   Your favorite is added to the list.

7.10.2. Open a favorite
1. Click Favorites.
   The Manage favorites dialog box opens.
2. 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.
3. Click the name.

7.10.3. 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.
   The Rename favorite dialog box opens.
4. Type the new name and click **Update**.

### 7.10.4. 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.

   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.

### 7.10.5. 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**.

### 7.10.6. 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**.
7.10.7. 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.

7.11. 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.

7.12. 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.

7.13. 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 left 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.

7.14. 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.

7.15. 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.

7.16. 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.

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

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

7.17. See also
• Manage legends
Chapter 8. Using the Maps app

8.1. About the Maps app

The Maps App is introduced in release 2.29 and serves as a replacement of the GIS App offering a more intuitive and user-friendly interface.

With the Maps 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 users and groups.

Note

To use predefined legends in the Maps app, you need to create them first in the Maintenance app.

Here’s an overview of the Maps app workspace

- The **layer panel** on the left side of the workspace shows an overview of the layers for the current map:
  - As layers are added, using the **(+)** Add layer button, they are arranged and managed in this panel.
  - The **basemap** is always shown in the panel. The default basemap is OSM Light and is selected by default. OpenStreetMap Detailed, Google Streets and Google Hybrid are also available. You can use these maps as background maps and layers. Switch between them by selecting the desired image.
  - The small arrow button to the right of the layer panel, at the top, allows the panel to be hidden or shown.
- The **File** button near the top left allows you to open and save maps:
  - **New** will clear any existing map layers to create a new map.
Using the Maps app

Open will display a dialog box with a list of existing maps where they be opened, renamed, shared and deleted. The title of the current map is displayed in the header bar above the File button.

Save will save any changes to the current map.

Save as will save the current map with a new name.

Rename allows you to change the name and/or description of the current map.

Translate allows you to translate the name and/or description of the current map.

Share will open a dialog where the current map can be shared with everyone or a group of users.

Get link will provide a direct link to the current map.

Delete deletes the current map.

- The Interpretations button at top right opens an interpretations panel on the right side of the workspace. The button is only clickable if the map is saved.
- Details shows information about the current map.
- Interpretations allows you to view, add, edit and share interpretations about the current map.

- The + and - buttons on the map allow you to zoom in and out of the map respectively. The mouse scroll wheel can also be used for altering the zoom.
- Zoom to content (bounded magnifying glass symbol) automatically adjusts the zoom level and map center position to put the data on your map in focus.
- Search (magnifying glass symbol) allows searching for and jumping to a location on the map.
- The ruler button allows you to find the distance between two locations on the map.
- To view information for an event, simply click the event.
- Right-click on the map to display the longitude and latitude of that location.
- The home icon on the top right of the workspace will take you back to the DHIS2 dashboard.
- The About button will display system version information.

Basemaps

Basemap layers are represented by layer cards in the layer panel such as:
Along the top of the basemap card from left to right are:

- The title of the selected basemap
- An eye symbol for toggling the visibility of the layer
- An arrow symbol to collapse and expand the basemap card

In the middle of the basemap card is the list of available basemaps. The current basemap is highlighted.

Along the bottom of the basemap card is:

- A slider for modifying the layer transparency

### 8.2. Create a new map

You can create a new thematic map by adding one or more different layers in the **DHIS2 Maps** app.

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

2. Click the (+) Add layer button in the top left. You are presented with the layer selection dialog:

3. Select a layer to add to the current map. Possible options are:
   - **Events**
   - **Tracked entities**
   - **Facilities**
   - **Thematic**
   - **Boundaries**

   In addition, there are several layers provided by Google Earth Engine and other services:
   - Population density
   - Elevation
   - Temperature
   - Precipitation
   - Landcover

   **Labels overlay** is an external layer defined in the database used for the above example.
8.3. 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.

Example of an event layer

Event layers are represented by layer cards in the layer panel such as:

Along the top of the event card from left to right are:
- A grab field to allow dragging and re-ordering layers with the mouse
- The title and period associated with the layer
- An eye symbol for toggling the visibility of the layer
- An arrow symbol to collapse and expand the event card

In the middle of the event card is a legend indicating the styling of the layer.

Along the bottom of the event card from left to right are:
- An edit (pencil) button to open the layer configuration dialog
• A slider for modifying the layer transparency
• A delete (trash can) icon to remove the layer from the current thematic map.

8.3.1. Create an event layer

To create an event layer, choose Events on the Add layer selection. This opens the Events layer configuration dialog.

1. In the DATA tab:

   • Select a program and then select a program stage. The Stage field is only shown once a program is selected.

     If there is only one stage available for the selected program, the stage is automatically selected.

   • 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.

2. In the PERIOD tab:

   • select the time span for when the events took place. You can select either a fixed period or a relative period.

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

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

3. In the FILTER tab:
• Click ADD FILTER and select an available data item to add a new filter to the data set.

• For data item 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 item 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.

Multiple filters may be added. Click the X on the far right of the filter to remove it.

4. In the **ORG UNITS** tab:

• Select the organisation units you want to include in the layer. It is possible to select either

  • One or more specific organisation units, or

  • A relative level in the organisation unit hierarchy, with respect to the user. By selecting a **User organisation unit** the map data will appear differently for users at different levels in the organisation unit hierarchy.

5. In the **STYLE** tab:
• Select **Group events** to group nearby events (cluster), or **View all events** to display events individually.

• Select a **color** for the event or cluster points.

• Select the **radius** (between 1 and 20) for the events.

• Select **Show buffer** to display visual buffer around each event. The radius of the buffer can be modified here. This option is only available if you select **View all events** above.

6. Click **ADD LAYER**.

### 8.3.2. Modify an event layer

1. In the layer panel, click the edit (pencil) icon on the event layer card.

2. Modify the setting on the DATA, PERIOD, FILTER, ORG UNIT and STYLE tabs as desired.

3. Click **UPDATE LAYER**.

### 8.3.3. Modify information in event pop-up windows

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.

8.3.4. Clear event layer

To clear all event layer data in a map:
1. In the layer panel, click the delete (trash can) icon on the event layer card.

The layer is removed from the current map.

8.4. Manage tracked entity layers

The tracked entity layer displays the geographical location of tracked entities registered in the DHIS2. Provided that tracked entities have associated point or polygon coordinates, you can explore these on a map.

Example of a tracked entity layer

Tracked entity layers are represented by layer cards in the layer panel such as:

Along the top of the tracked entity card from left to right are:
- A grab field to allow dragging and re-ordering layers with the mouse.
- The title and period associated with the layer.
- An eye symbol for toggling the visibility of the layer.
Using the Maps app

Create a tracked entity layer

- An arrow symbol to collapse and expand the tracked entity card.

In the middle of the tracked entity card is a legend indicating the styling of the layer.

Along the bottom of the tracked entity card from left to right are:
- An edit (pencil) button to open the layer configuration dialog.
- A slider for modifying the layer transparency.
- A delete (trash can) icon to remove the layer from the current map.

8.4.1. Create a tracked entity layer

To create an tracked entity layer, choose Tracked entities on the Add layer selection. This opens the Tracked entity layer configuration dialog.

1. In the DATA tab:

   ![Edit tracked entity layer](image)

   - Select the Tracked Entity Type you want to show on the map.
   - Select a Program where the tracked entities belong.
   - Set the Program status to be Active or Completed.
   - Set the Follow up status of the tracked entity for the given program.

2. In the PERIOD tab:

   ![Edit tracked entity layer](image)

   - If no program is selected, you can set start and end dates when the tracked entities were last updated.
   - If a program is selected, you can set start and end dates for the program period.

3. In the ORG UNITS tab:
• Select the organisation units you want to include in the layer. You have 3 selection modes:
  • Selected only: Include tracked entities belonging to selected org units only.
  • Selected and below: Included tracked entities in and right below selected org units.
  • Selected and all below: Included tracked entities in and all below selected org units.

4. In the **STYLE** tab:

- Select a **color** for the tracked entities points and polygons.
- Select the **point size** (radius between 1 and 20) for the points.
- Select **Show buffer** to display visual buffer around each tracked entity. The buffer distance in meters can be modified here.

5. Click **ADD/UPDATE LAYER**.

### 8.4.2. Modify a tracked entity layer

1. In the layer panel, click the edit (pencil) icon on the tracked entity layer card.
2. Modify the setting on the **DATA**, **PERIOD**, **ORG UNIT** and **STYLE** tabs as desired.
3. Click **UPDATE LAYER**.

### 8.4.3. Clear a tracked entity layer

To clear a tracked entity layer from a map:
1. In the layer panel, click the delete (trash can) icon on the tracked entity layer card.

The layer is removed from the current map.
8.5. 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.*

**Example of a facility layer**

Facility layers are represented by layer cards in the layer panel such as:

Along the top of the facilities card from left to right are:
- A grab field to allow dragging and re-ordering layers with the mouse
- The **Facilities** title
- An eye symbol for toggling the visibility of the layer
- An arrow symbol to collapse and expand the facilities card

In the middle of the facilities card is a legend indicating the group set representation.
Along the bottom of the facilities card from left to right are:

- An edit (pencil) button to open the layer configuration dialog
- A data table toggle button to show or hide the data table associated with the layer
- A slider for modifying the layer transparency
- A delete (trash can) icon to remove the layer from the current thematic map.

8.5.1. Create a facility layer

To create facility layer, choose Facilities on the Add layer selection. This opens the Facility layer configuration dialog.

1. In the GROUP SET tab:

   - Select a Group set from the list of organisation unit group sets defined for your DHIS2 instance.

2. In the ORGANISATION UNITS tab

   - Select the organisation unit level(s) and/or group(s) from the selection fields on the right hand side.
   - Select the organisation units you want to include in the layer. It is possible to select either
     - One or more specific organisation units, or
     - A relative level in the organisation unit hierarchy, with respect to the user. By selecting a User organisation unit the map data will appear differently for users at different levels in the organisation unit hierarchy.

3. In the STYLE tab:
• select any styling you wish to apply to the facilities.

  Show labels  Allows labels to be shown on the layer. Font size, weight and color can be modified here.

  Show buffer  Allows a visual buffer to be displayed on the layer around each facility. The radius of the buffer can be modified here.

4. Click **ADD LAYER**.

### 8.5.2. Create or modify a facility layer

1. In the layer panel, click the edit (pencil) icon on the facility layer card.

2. Modify the setting on the GROUP SET, ORGANISATION UNITS and STYLE tabs as desired.

3. Click **UPDATE LAYER**.

### 8.5.3. Filter values in a facility layer

Facility layers have a **data table** option that can be toggled on or off from the facility layer card.
Example of a facility layer showing the data table

The data table displays the data forming the facility layer.
- clicking on a title will sort the table based on that column; toggling between ascending and descending.
- entering text or expressions into the filter fields below the titles will apply those filters to the data, and the display will adjust according to the filter. The filters are applied as follows:

  NAME   filter by name containing the given text
  ID     filter by IDs containing the given text
  TYPE   filter by GIS display types containing the given text

Note
Data table filters are temporary and are not saved with the map layers as part of the favourite.

8.5.4. Search for a facility
The NAME filter field in the data table provides an effective way of searching for individual facilities.

8.5.5. Remove facility layer
To clear all data in a facility layer:
1. In the layer panel, click the delete (trash can) icon on the facility layer card.
   The layer is removed from the current map.

8.5.6. Manage facilities in a layer
You can have facilities in Facility, Boundary and Thematic layers.
8.5.6.1. 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.

8.5.6.2. Swap longitude and latitude of a facility

1. Right-click a facility and click **Swap longitude/latitude**.

This is useful if a user inverted latitude and longitude coordinates when creating the organisation unit.

8.5.6.3. Display facility information

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

**Table 8.1. View organisation unit information**

<table>
<thead>
<tr>
<th>Function</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>View information for the current period</td>
<td>1. Click a facility.</td>
</tr>
<tr>
<td>View information for a selected period</td>
<td>1. Right-click a facility and click <strong>Show information</strong>.</td>
</tr>
<tr>
<td></td>
<td>2. In the <strong>Infrastructural data</strong> section, select a period.</td>
</tr>
</tbody>
</table>

**Note**

You configure the displayed infrastructural data in the **System Settings** app.

8.6. Manage thematic layers

*Thematic maps* represent spatial variation of geographic distributions. Select your desired combination of indicator/data element, period and 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.
**Example of a thematic map**

Thematic layers are represented by layer *cards* in the layer panel such as:

![Thematic card example](image)

Along the top of the thematic card from left to right are:
- A grab field to allow dragging and re-ordering layers with the mouse
- The title and period associated with the layer
- An eye symbol for toggling the visibility of the layer
- An arrow symbol to collapse and expand the thematic card

In the middle of the thematic card is a legend indicating the value ranges displayed on the layer.

Along the bottom of the thematic card from left to right are:
- An edit (pencil) button to open the layer configuration dialog
- A **data table** toggle button to show or hide the data table associated with the layer
- A slider for modifying the layer transparency
- A delete (trash can) icon to remove the layer from the current thematic map.
8.6.1. Create a thematic layer

To create an event layer, choose **Thematic** on the **Add layer** selection. This opens the Events layer configuration dialog.

1. In the **DATA** tab:

   ![Image](image_url)

   • Select a data type and then select respectively the group and the target element. The available fields depend on the type of item selected.

   • Select a value from the **Aggregation type** field for the data values to be shown on the map. By default, “By data element” is selected. Alternative values are: Count; Average; Sum; Standard deviation; Variance; Min; Max. See also **Aggregation operators**.

2. In the **PERIOD** tab:

   ![Image](image_url)

   • select the time span over which the thematic data is aggregated. You can select either a fixed period or a relative period.

   **Fixed period**
   
   In the **Period type** field select period length, then select the target in the **Period** field.

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

3. In the **ORG UNITS** tab:
• Select the organisation units you want to include in the layer. It is possible to select either
  • One or more specific organisation units, or
  • A relative level in the organisation unit hierarchy, with respect to the user. By selecting
    a User organisation unit the map data will appear differently for users at different
    levels in the organisation unit hierarchy.

4. In the **STYLE** tab:

• Select either **Automatic** or **Predefined** legend.
  • 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 the range of each interval will be **highest data value - lowest
    data value / number of classes**
    
    Equal counts the legend creator will try to distribute the organisation units evenly.
  • If you have facilities in your thematic layer, you can set the radius for minimum
    and maximum values by changing the values in the **Low size** and **High size** boxes
    respectively.

5. Click **ADD LAYER**.

8.6.2. **Modify a thematic layer**

1. In the layer panel, click the edit (pencil) icon on the thematic layer card.
2. Modify the setting on the **DATA**, **PERIOD**, **ORG UNITS** and **STYLE** tabs as desired.
3. Click **UPDATE LAYER**.

### 8.6.3. Filter values in a thematic layer

Thematic layers have a **data table** option that can be toggled on or off from the thematic layer card.

**Example of a thematic map showing the data table**

![Thematic Map Data Table](image)

The data table displays the data forming the thematic layer.

- clicking on a title will sort the table based on that column; toggling between ascending and descending.
- entering text or expressions into the filter fields below the titles will apply those filters to the data, and the display will adjust according to the filter. The filters are applied as follows:

  - **NAME** filter by name containing the given text
  - **VALUE** filter values by given numbers and/or ranges, for example: 2,>3&<8
  - **LEGEND** filter by legend containing the given text
  - **RANGE** filter by ranges containing the given text
  - **LEVEL** filter level by numbers and/or ranges, for example: 2,>3&<8
  - **PARENT** filter by parent names containing the given text
  - **ID** filter by IDs containing the given text
  - **TYPE** filter by GIS display types containing the given text
  - **COLOR** filter by color names containing the given text
Example of filtering by name in the data table

<table>
<thead>
<tr>
<th>INDEX</th>
<th>NAME</th>
<th>VALUE</th>
<th>LEVEL</th>
<th>NAME</th>
<th>LEVEL</th>
<th>PMETH</th>
<th>ID</th>
<th>TYPE</th>
<th>COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Dhaka</td>
<td>122.1</td>
<td>116.7</td>
<td>295.4</td>
<td>1</td>
<td>80</td>
<td>177483284735</td>
<td>MultiPolygon</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Dhaka City</td>
<td>65.3</td>
<td>65.8</td>
<td>80</td>
<td>1</td>
<td>80</td>
<td>177483284735</td>
<td>MultiPolygon</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Gerefa</td>
<td>162.2</td>
<td>116.7</td>
<td>295.4</td>
<td>1</td>
<td>80</td>
<td>177483284735</td>
<td>MultiPolygon</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Gokkon</td>
<td>126.4</td>
<td>116.7</td>
<td>295.4</td>
<td>1</td>
<td>80</td>
<td>177483284735</td>
<td>MultiPolygon</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Hama Bank</td>
<td>122.0</td>
<td>116.7</td>
<td>295.4</td>
<td>1</td>
<td>80</td>
<td>177483284735</td>
<td>MultiPolygon</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Kalungi</td>
<td>120.2</td>
<td>116.7</td>
<td>295.4</td>
<td>1</td>
<td>80</td>
<td>177483284735</td>
<td>MultiPolygon</td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>Korogga</td>
<td>162</td>
<td>116.7</td>
<td>295.4</td>
<td>1</td>
<td>80</td>
<td>177483284735</td>
<td>MultiPolygon</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Kongbala</td>
<td>135</td>
<td>94.8</td>
<td>118.7</td>
<td>3</td>
<td>80</td>
<td>177483284735</td>
<td>MultiPolygon</td>
<td></td>
</tr>
</tbody>
</table>

**Note**

Data table filters are temporary and are not saved with the map layers as part of the favourite.

8.6.4. Search for an organisation unit

The NAME filter field in the data table provides an effective way of searching for individual organisation units.

8.6.5. 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 one level** or **Drill down one level**.

The drill down option is disabled if you are on the lowest level or if there are no coordinates available on the level below. Likewise the drill up option is disabled from the highest level.

8.6.6. Remove thematic layer

To clear all data in a thematic layer:

1. In the layer panel, click the delete (trash can) icon on the thematic layer card.

The layer is removed from the current map.
8.7. Manage boundary layers

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

**Boundary layer**

Boundary layers are represented by layer cards in the layer panel such as:

Along the top of the boundary card from left to right are:
- A grab field to allow dragging and re-ordering layers with the mouse
- The **Boundaries** title
- An eye symbol for toggling the visibility of the layer
- An arrow symbol to collapse and expand the boundary card

Along the bottom of the boundary card from left to right are:
- An edit (pencil) button to open the layer configuration dialog
- A **data table** toggle button to show or hide the data table associated with the layer
- A slider for modifying the layer transparency
- A delete (trash can) icon to remove the layer from the current thematic map.

8.7.1. Create a boundary layer

To create boundary layer, choose **Boundaries** on the **Add layer** selection. This opens the Boundary layer configuration dialog.

1. In the **ORGANISATION UNITS** tab
• select the organisation unit level(s) and/or group(s) from the selection fields on the right hand side.

• Select the organisation units you want to include in the layer. It is possible to select either
  • One or more specific organisation units, or
  • A relative level in the organisation unit hierarchy, with respect to the user. By selecting a User organisation unit the map data will appear differently for users at different
    levels in the organisation unit hierarchy.

2. In the STYLE tab:

• select any styling you wish to apply to the boundaries.
  Show labels  Allows labels to be shown on the layer. Font size and weight can be modified here.
  Point radius  Sets the base radius when point type elements, such as facilities, are presented on the boundary layer.

3. Click **ADD LAYER**.

### 8.7.2. Modify a boundary layer

1. In the layer panel, click the edit (pencil) icon on the boundary layer card.
2. Modify the setting on the ORGANISATION UNITS and STYLE tabs as desired.
3. Click **UPDATE LAYER**.
8.7.3. Filter values in a boundary layer

Boundary layers have a **data table** option that can be toggled on or off from the boundary layer card.

**Example of a boundary layer showing the data table**

The data table displays the data forming the boundary layer.
- clicking on a title will sort the table based on that column; toggling between ascending and descending.
- entering text or expressions into the filter fields below the titles will apply those filters to the data, and the display will adjust according to the filter. The filters are applied as follows:

<table>
<thead>
<tr>
<th>NAME</th>
<th>LEVEL</th>
<th>PARENT</th>
<th>ID</th>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berga</td>
<td>3</td>
<td>Bo</td>
<td>D72ourg012G</td>
<td>MultiPolygon</td>
</tr>
<tr>
<td>Bombe Selawre</td>
<td>3</td>
<td>Bombe</td>
<td>H02310y6Y5Y</td>
<td>MultiPolygon</td>
</tr>
<tr>
<td>36</td>
<td>Bos</td>
<td>6</td>
<td>NhcreesbOp2</td>
<td>MultiPolygon</td>
</tr>
<tr>
<td>51</td>
<td>Gondar</td>
<td>3</td>
<td>Tana</td>
<td>Nh22E0w5H</td>
</tr>
<tr>
<td>41</td>
<td>Jekima</td>
<td>3</td>
<td>Go</td>
<td>Nh2AP0etQ</td>
</tr>
<tr>
<td>50</td>
<td>Korgasso</td>
<td>3</td>
<td>Mogombe</td>
<td>ZG24Hert9w</td>
</tr>
<tr>
<td>59</td>
<td>Kombone</td>
<td>3</td>
<td>Jharp320BM</td>
<td>MultiPolygon</td>
</tr>
<tr>
<td>66</td>
<td>Kpehe</td>
<td>3</td>
<td>Mogombe</td>
<td>Jh2424be00th</td>
</tr>
</tbody>
</table>

**Note**

Data table filters are temporary and are not saved with the map layers as part of the favourite.

8.7.4. Search for an organisational unit

The NAME filter field in the data table provides an effective way of searching for individual organisational units displayed in the boundary layer.

8.7.5. Navigate between organisation hierarchies

You can modify the target of the boundary layer in the hierarchy without using the level/parent user interface.
1. Right-click one of the boundaries.
2. Select **Drill up one level** or **Drill down one level**.

The drill down option is disabled if you are on the lowest level. Likewise the drill up option is disabled from the highest level.

### 8.7.6. Remove boundary layer

To clear all data in a boundary layer:

1. In the layer panel, click the delete (trash can) icon on the boundary layer card.

The layer is removed from the current map.

### 8.8. Manage Earth Engine layer

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

- Population density estimates with national totals adjusted to match UN population division estimates. Population in 100 x 100 m grid cells (from 2010).
- Elevation above sea-level. You can adjust the min and max values so it better represents the terrain in your region.
- Temperature: Land surface temperatures collected from satellite. Blank spots will appear in areas with a persistent cloud cover.
- Precipitation collected from satellite and weather stations on the ground. The values are in millimeters within 5 days periods. Updated monthly, during the 3rd week of the following month.
- Land cover: 17 distinct landcover types collected from satellites.
- Nighttime lights: Lights from cities, towns, and other sites with persistent lighting, including gas flares (from 2013).
8.8.1. Create an Earth Engine layer

To create an Earth Engine layer, choose the desired layer from the Add layer selection. This opens the layer configuration dialog.

1. In the STYLE tab

- Modify the parameters specific to the layer type.
- Adjust the legend range, steps and colors, as desired.

2. Click ADD LAYER.

8.9. Add external map layers

External map layers are represented as either:

Basemaps These are available in the basemap card in the layers panel and are selected as any other basemap.

Overlays These are available in the Add layer selection. Unlike basemaps, overlays can be placed above or below any other overlay layers.

Overlay layers are represented by additional layer cards in the layer panel such as:

Along the top of the overlay card from left to right are:
- A grab field to allow dragging and re-ordering layers with the mouse
- The title of the external map layer
- An eye symbol for toggling the visibility of the layer
- An arrow symbol to collapse and expand the overlay card

Along the bottom of the overlay card from left to right are:
- A slider for modifying the layer transparency
- A delete (trash can) icon to remove the layer from the current thematic map.
Here are some examples of external layers:

**Example 1: Dark basemap with nighttime lights from Google Earth Engine**

![Example 1: Dark basemap with nighttime lights from Google Earth Engine](image1)

**Example 2: Terrain basemap**

![Example 2: Terrain basemap](image2)

**Example 3: Aerial imagery of Dar-es-Salaam**

![Example 3: Aerial imagery of Dar-es-Salaam](image3)

**Note**

To define external map layers, see the ???.

### 8.10. File menu

Use the **File menu** to manage your maps. Several menu items will be disabled until you open or save a map.

Saving your maps 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 layer configurations as a favorite.
8.10.1. Create a new map

Click File > New.

NB! This will clear the current map layers you have without saving.

8.10.2. Open a new map

1. Click File > Open. A dialog box opens with a list of maps.

2. Find the favorite you want to open. You can either use < and > or the search field to find a saved map. The list is filtered on every character that you enter. You can filter the list by selecting Show all, Created by me or Created by others.

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

8.10.3. Save a map

When you have created a map it is convenient to save it for later use:

1. Click File > Save.

2. Enter a Name (required) and a Description (optional) the first time you save a map.

3. Click SAVE.

8.10.4. Save a copy of a map

1. Click File > Save as...

2. Enter a Name (required) and a Description (optional) for the map.

3. Click SAVE.
8.10.5. Rename a map
1. Click **File > Rename**.
2. Enter a new **Name** and/or **Description** for your map.
3. Click **RENAME**. The map is updated.

You can also rename maps without opening them:
1. Click **File > Open**. A dialog box opens with a list of maps.
2. Find the map you want to rename. You can either use < and > or the search field.
3. Click the more options icon (three dots) at the right of the map row, and select **Rename**.
4. Follow the steps above.

8.10.6. Translate a map
1. Click **File > Translate**.
2. Select the **Locale** (language) your translation.
3. Enter a translated **Name** and **Description**. The original text will show below the field.
4. Click **SAVE**.

8.10.7. Modify sharing settings for a map

After you have created a map and saved it, you can share the map with everyone or a user group. To modify the sharing settings:
1. Click **File > Share**. The sharing settings dialog opens.
2. In the text box, search for the name of the user or group you want to share your favorite with and select it.
   
   The chosen user or group is added to the list of recipients.

   Repeat the step to add more user groups.
3. If you want to allow external access, select the corresponding box.
4. For each user group, choose an access setting. The options are:
   • None (for default groups only, as they cannot be removed)
   • Can view
   • Can edit and view
5. Click **CLOSE** to close the dialog.

You can also rename maps without opening them:
1. Click **File > Open**. A dialog box opens with a list of maps.
2. Find the map you want to share. You can either use < and > or the search field.
3. Click the more options icon (three dots) at the right of the map row, and select **Share**.
4. Follow the steps above.

8.10.8. Get the link to a map
1. Click **File > Get link**. A link dialog opens.
2. Copy the link.

8.10.9. Delete a map
1. Click **File > Delete**. A confirmation dialog is displayed.
2. Click **DELETE** to confirm that you want to delete the favorite. Your map is deleted and the layers are cleared from the view.
You can also delete maps without opening them:
1. Click **File > Open**. A dialog box opens with a list of maps.
2. Find the map you want to delete. You can either use < and > or the search field.
3. Click the more options icon (three dots) at the right of the map row, and select **Delete**.
4. Follow step 2 above.

### 8.11. Map interpretations

An interpretation is a description of a map at a given period. This information is visible in the **Dashboard app**. Click **Interpretations** in the top right of the workspace to open the interpretations panel. The button is only clickable if the map is saved.

**The interpretations panel shown on the right side of the workspace**

#### 8.11.1. 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 **Interpretations** in the top right of the workspace to open the interpretations panel.
3. Click an interpretation. Your map displays the data and the date based on when the interpretation was created. To view other interpretations, click them.

#### 8.11.2. Write interpretation for a map

To create an interpretation, you first need to create a map and save it. If you've shared your map with other people, the interpretation you write is visible to those people.
1. Open a favorite with interpretations.
2. Click **Interpretations** in the top right of the workspace to open the interpretations panel.
3. Click + to write a new interpretations.
4. In the text field, type a comment, question or interpretation. You can also mention other users with '@username'. Start by typing '@' plus the first letters of the username or real
name and a mentioning bar will display the available users. Mentioned users will receive an internal DHIS2 message with the interpretation or comment. You can see the interpretation in the Dashboard app.

5. Click SAVE if you want your interpretation to have the same sharing settings as the map.

   Click SAVE & SHARE if you want to change the sharing settings (see below) for your interpretation.

8.11.3. Change sharing settings for an interpretation

1. Click an interpretation (see how to view an interpretation above).
2. Click Share below the interpretation. The sharing settings dialog opens.
3. Search for and add a users and user groups that you want to share your map with.
4. Change sharing settings for the users you want to modify:
   • Can edit and view: Everyone can view and edit the object.
   • Can view only: Everyone can view the object.
   • No access: The public won't have access to the object. This setting is only applicable to Public access.
5. Click CLOSE when sharing settings are updated.

8.12. 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.

8.13. Search for a location

The place search function allows you to search for almost any location or address. 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 Maps 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.

8.14. 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 (ruler) icon and click Create new measurement.
2. Add points to the map.
3. Click Finish measurement.

8.15. Get the latitude and longitude at any location
   Right-click a point on the map and select Show longitude/latitude. The values display in a pop-up window.

8.16. See also
   - Manage legends
Chapter 9. Managing dashboards

9.1. 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 9.1.

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

9.2. Dashboard and control bar

Dashboards have a title, description, and any number of dashboard items. The dashboard items can be of many different types, including charts, maps, reports, tables, resources, messages, and text items. Above the dashboard is the control bar, which shows all your available dashboards, including a dashboard search field, and a + button for creating a new dashboard.

The dashboard has two modes: view and edit/create. When you first log in to DHIS2, your most recently used dashboard will be displayed in view mode, if you are on the same computer as you were previously. If you are using a different computer, then the first starred dashboard will be displayed. If there are no starred dashboards, then the first dashboard will be displayed. Starred dashboards always show first in the dashboard list.

The screenshot below shows a dashboard called "Antenatal Care", which has been populated with charts and maps.
9.2.1. **Searching in the list of dashboards**

You can search for a specific dashboard using the search field in the upper left of the control bar entitled “Search for a dashboard”. The search is case insensitive, and as you type, the list of dashboards will filter down to those that match your search text.

9.2.2. **Customizing the height of the control bar**

You can set a specific height for the dashboards control bar by down-clicking and dragging the bottom edge of the control bar. When you finish dragging, the new height will be set. Clicking on **SHOW MORE** will expand the control bar to its maximum height (10 "rows"). Clicking on **SHOW LESS** will reset the height to your customized height.

9.3. **Creating a dashboard**

To create a new dashboard, click the green + button in the left corner of the control bar to go into create mode. Add a title in the title field, and optionally a description in the description field.

![Create mode](image)

9.3.1. **Adding items to the dashboard**

Add items to the dashboard by searching from the item selector in the upper right part of the dashboard area. Available items include:

- Pivot tables
- Charts
- Maps
- Event reports
- Event charts
- Report
- Resources
- Apps
- Email
- Text boxes
- Spacer
The list of items in the dropdown initially displays the first 5 available from each category, based on the search text you enter. Email, text boxes and spacer items are also found in the dropdown. To view more items, click on **SEE MORE**, and the list for that type will be extended to 15 items. If you still do not find the item you want, try typing a more specific search text.

Once you select an item, it will be added to the top left position of the dashboard. The added items can be moved using the mouse by down-clicking on the item and dragging it to the desired position. It can also be resized with the mouse by down-clicking on the drag handle in the lower right corner of the item and dragging to the desired size.

**9.3.1.1. Spacer items**

The dashboard is configured with the "anti-gravity" setting for positioning items. This means that items will "rise" upwards until they run into another item. In order to force empty vertical space between items (like an empty row), you can add spacer items to the dashboard. They are only visible in edit/create mode. In view mode, they are not displayed, but take up the defined space.

**Spacer in edit/create mode:**
9.3.2. Removing items

Remove items by clicking on the red trash can at the upper right of the item. Be aware that because of the "anti-gravity" setting in the dashboard, when you remove an item, the items that are positioned below the removed item will "rise" upwards.

9.3.3. Saving the dashboard

When creating or editing a dashboard, changes are only saved when you click **SAVE CHANGES** button in the dashboard edit bar at the top of the page. If you don't want to save your changes,
click the **EXIT WITHOUT SAVING** button to the upper right. You will then be returned to view mode with the dashboard you were previously viewing.

### 9.4. Editing an existing dashboard

If you have access rights to edit the currently active dashboard, there will be an **EDIT** button to the right of the dashboard title in view mode. Click on this button to enter edit mode.

Refer to the above section about creating dashboards for information on adding and removing items to the dashboard.

#### 9.4.1. Translating dashboard title and description

You can add translations for dashboard title and description while in edit mode. The dialog provides a list of languages to translate to, and shows the original dashboard title underneath the name input field.

1. Click on the **TRANSLATE** button located above the dashboard
2. Select the language you wish to add a translation for.
3. Add the title and/or description, and click **SAVE**

#### 9.4.2. Deleting a dashboard

If you have access to delete the dashboard, then there will be a **DELETE** button located above the dashboard, when in edit mode. A confirmation dialog will first be displayed to confirm that you want to delete the dashboard.
9.5. Viewing a dashboard

When in view mode, you can toggle showing the description, star a dashboard, apply a dashboard filter, and share the dashboard with other users and groups.

To view the description, click on the i button to the right of the title.

9.5.1. Starred dashboards

Your starred dashboards are listed first in the list of dashboards. To star a dashboard, click on the star button to the right of the title. When the star is “filled”, that means the dashboard is starred. Starring a dashboard only applies to you, not other users.

9.5.2. Filtering a dashboard

To filter the dashboard by organisation unit, click on the FILTER button to the right of the dashboard title. Select the organisation units you want to apply to the dashboard. This only affects you, no other users. The only dashboard items that are impacted by the organisation unit filter are visualization items (pivot table, chart, map) that have their organisation unit configured to "User org unit". If you reload the dashboard, the filter will be cleared.

9.5.3. Dashboard items with charts, pivot tables and maps

9.5.3.1. Switching between visualizations

Dashboard items showing charts, pivot tables and maps can be toggled between these visualizations. Click on the buttons in the upper right corner of the item to toggle between visualizations.
9.5.4. Interpretations

You can write interpretations for the chart, pivot table, map, event report, and event chart items. Click on the interpretations button, and the item will be expanded vertically underneath to show the interpretations and replies. You can like an interpretation, reply to an interpretation, and add your own interpretation. You can edit or delete your own interpretations and replies, and if you have moderator access, you can delete others’ interpretations.

It is possible to format the text with **bold**, *italic* by using the Markdown style markers * and _ for **bold** and *italic* respectively. Keyboard shortcuts are also available: Ctrl/Cmd + B and Ctrl/Cmd + I. A limited set of smilies is supported and can be used by typing one of the following character combination: :) :-) :( :-( :+1 :-1. URLs are automatically detected and converted into a clickable link.

9.5.5. Sharing a dashboard

In order to share a dashboard with user groups, click on the SHARE button to the right of the dashboard title to display the dashboard sharing settings options. To share the dashboard with specific users or user groups, type in the name in the input field 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 that 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.

You can provide users with the url of the dashboard, allowing them to navigate directly to the dashboard. To get the dashboard url, just access the dashboard in view mode, and copy the browser url. For example, the url to the Antenatal Care dashboard in play.dhis2.org/demo is:

**Example 9.2.**

https://play.dhis2.org/demo/dhis-web-dashboard/#/nghVCwtyzi
Chapter 10. Messaging

10.1. 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 called the feedback recipient 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.

In addition to the user-to-user and feedback messages, depending on your configuration the system will also send you system-generated messages. These messages could be triggered by different events, including system or background job failures and validation analysis results. Feedback handling tools are also available for validation results and the priority will be set to the importance of the validation rule violated.

To visit the app click message icon in header bar or find the Messaging app in the app search box.

**Note**

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

With 2.30 we introduced a new messaging app which offers a richer messaging experience. Specifically:

- Switch between list view and compact view by clicking the icon in the top right corner. This enables the user to view messages in two different views. The list view is simplistic and gives a good overview of all messages and is especially suited for feedback and validation messages. The compact view is a modern way of view messages where the user has more information in one view, hence viewing and replying several messages is easier. The first screenshot in this section displays list view, while the screenshot in section Read a message displays the compact view.
- A new search field is added which enables the user to search for messages. The search filters messages on different message attributes; subject, text and senders. This implies that you are able to narrow down the message conversation list by entering a search.
- A auto refresh feature is added so that the app fetches new messages at a set interval, every 5 minutes. This feature is disabled by default.
• For every message conversation you are able to add participants to the conversation. This is very useful if you want input on that particular conversation or if someone should also see the information. It is not possible to delete participants from a conversation.
1. Click **Compose**.

2. Define who you want to receive the message. You can send a message to organisation units, users and user groups.
   - In the **To** field you can search for organisation units, users and user groups and select the wished recipients.

3. Type a subject and a message.

4. Click **Send**.
10.3. Read a message

New version of DHIS2 is available!

Participants

Tracore  me

Message from me

EXAMPLE.PDF (0.20 MB)

Get the new version of DHIS2.

Message

EXAMPLE_REPLY.PDF (0.20 MB)

REPLY  DISCARD  UPLOAD ATTACHMENT
1. Select the appropriate message type to the left.
2. Click a message.

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

10.4. Create a feedback message
1. Follow the steps as for creating a message, only selecting **Feedback message** instead of entering recipients.
2. The message will be created as a feedback message and will appear in all of the specified users' **Ticket** folder.

10.5. Attachments

With 2.31 we introduced attachments to messages. When creating or replying to a message conversation you have the possibility to add attachments. Currently there are no limitations to type or size of the file.

10.6. Manage validation and feedback messages

**Note**

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

With the new app you manage extended tools for tickets and validation messages through the icon menu which appears when viewing a message or checking of messages in the conversation list.

<table>
<thead>
<tr>
<th>All messages selected</th>
<th>All messages selected and extended choice picker selected</th>
</tr>
</thead>
</table>

You'll receive feedback messages to your **Ticket** folder and validation messages to your **Validation** folder. For feedback and validation messages you've the following options in addition to the messages options:

**Table 10.1. Feedback handling tools**

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Priority</strong></td>
<td>You can mark a feedback/validation message with different priorities: <strong>None</strong>, <strong>Low</strong>, <strong>Medium</strong> or <strong>High</strong>. Setting the priority makes it easier to keep track of which feedback message you need resolved first, and which feedback messages that can wait.</td>
</tr>
</tbody>
</table>
### 10.7. 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.

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Status</strong></td>
<td>All feedback/validation messages get the status <strong>Open</strong> when created.</td>
</tr>
<tr>
<td></td>
<td>To keep track of existing feedback messages, you can change the status to <strong>Pending, Invalid</strong> or <strong>Solved</strong>.</td>
</tr>
<tr>
<td></td>
<td>You can filter feedback/validation messages based on their status with the two drop down menus in the internal header bar.</td>
</tr>
<tr>
<td><strong>Assigned to</strong></td>
<td>You can assign a feedback message to any member of the user group that is set up to handle feedback messages.</td>
</tr>
<tr>
<td></td>
<td>You can assign a validation message to any user in the system.</td>
</tr>
<tr>
<td></td>
<td>- means that you haven't assigned a user to the feedback message.</td>
</tr>
<tr>
<td><strong>Internal reply</strong></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>To send a reply that within the feedback handling user group, click <strong>INTERNAL REPLY</strong>.</td>
</tr>
</tbody>
</table>
Chapter 11. Set user account preferences

In **User settings**, you can change the display language of DHIS2 and the language of the database. The database language is the translated content of the metadata, such as data elements and indicators. You can also choose a display style, and enable or disable SMS and email notifications. If you wish to, you can choose to display a short name, such as "Joe" in the analysis modules, rather than your full name.

In **User profile**, you can add personal information to your profile such as your email address, mobile phone number, date of birth, profile picture and more. When you send messages, the person receiving the message can see these profile details. You can also provide account names for various direct messaging services, which will be used by the system.

In **Account settings**, you can reset your password and setup 2-Factor authentication. Setting up 2-Factor authentication will require you to download the Google Authenticator app on your mobile device.