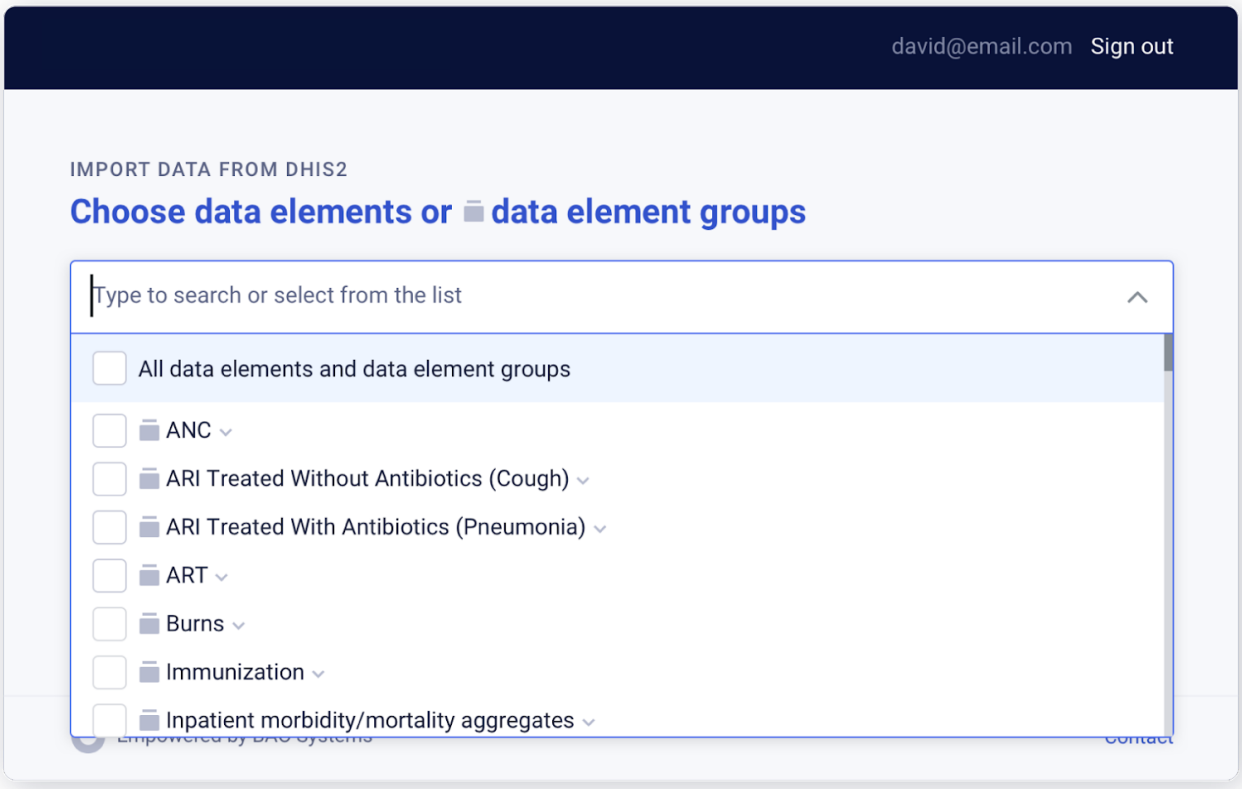
bao systems

# DHIS2-to-Tableau Connector

## User manual

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# Background

Funders are increasingly demanding robust data use for adaptive program management. While a number of global health and development NGOs implement DHIS2 to collect, manage, and visualize routine program data, users are increasingly demanding more advanced analytics capabilities beyond the software's core functionality. In addition, NGOs maintain multiple datasets that are housed in formats such as Excel, Access, ODK/Kobo/ONA, SQL, Sharepoint, Salesforce, etc. As a result, there is a growing demand for more robust data analytics platforms that enable data mashups from the variety of sources where data are stored and then support more advanced visualization features.

Tableau is one of several popular business intelligence ("BI") tools used by NGOs working in the global health and development sector. The use of Tableau for visualizing DHIS2 data is increasing among global health and development NGOs. Many users require support to efficiently exchange data between DHIS2 and Tableau. The DHIS2-to-Tableau Connector will enable users to:

- Seamlessly connection between Tableau Desktop and DHIS2;
- Create visualizations in Tableau for data element groups/data elements, for selected organizational units, within specific time periods;
- Establish a data model to maximize flexibility and create robust analytics;
- Interact with DHIS2 data on the Tableau desktop.

# Getting Started

## Installing Tableau Desktop

In order to use the Tableau desktop connector the user must own a Tableau desktop product license. Please reach out to Tableau directly if you don't currently own a license for this product. If you've purchased a product license, but do not yet have access to the Tableau desktop, you can download it via the following URL -https://www.tableau.com/support/releases.

All available versions work with the DHIS2 connector.

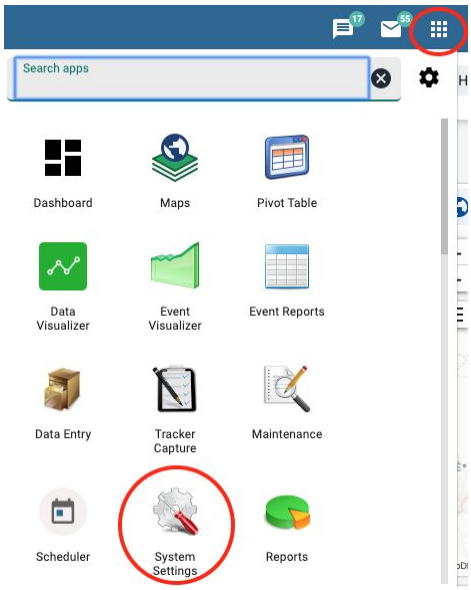
Unlike other integrations, the Tableau Connector does not require an app to be installed in DHIS2 although some configurations will be required on the DHIS2 server for the integration to work.

## Setting up the connector in DHIS2

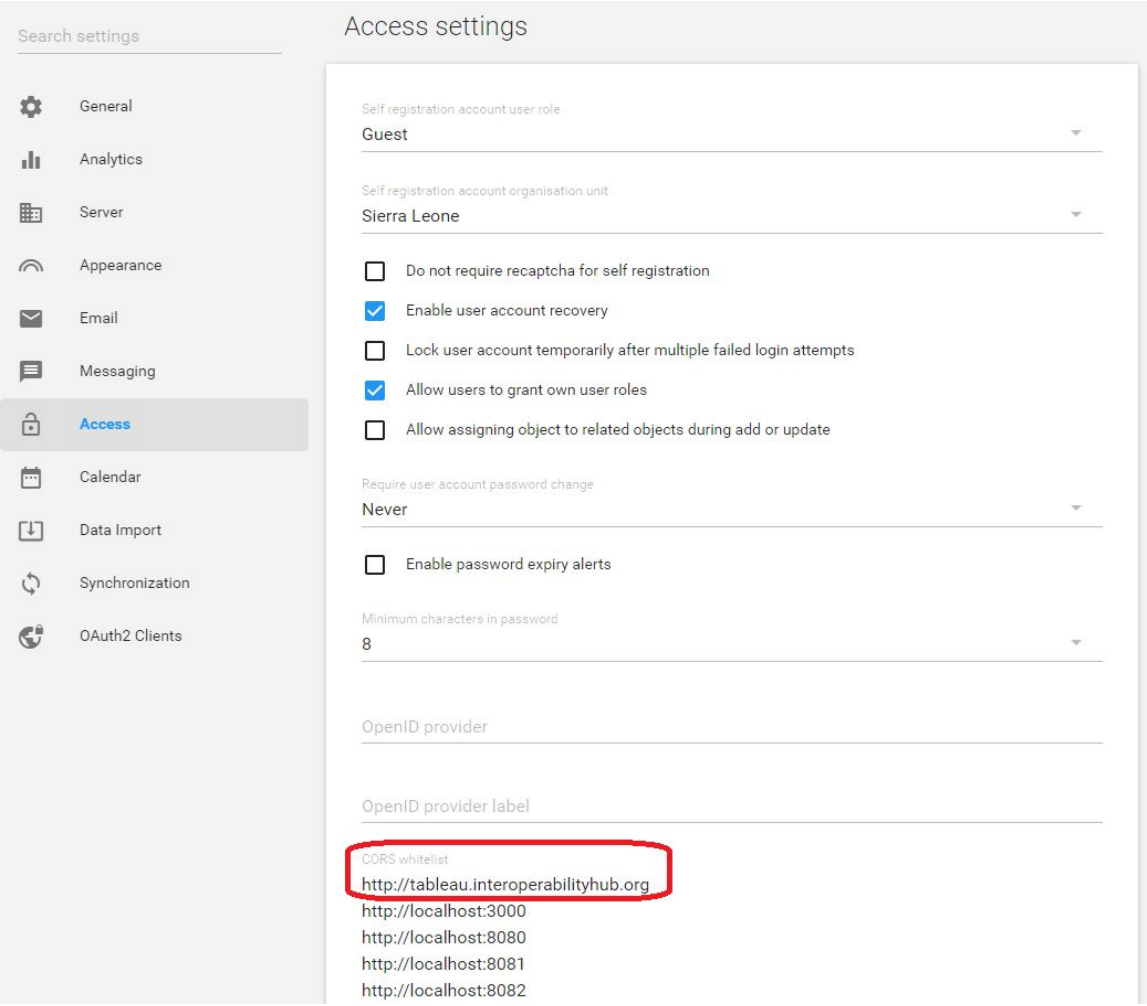
The connector is the means of communication between the DHIS2 server and Tableau Desktop .

To set up the connector in DHIS2:

1. Hover over (or click) the Apps button in the upper right corner on the header bar, and then click the System Settings icon:

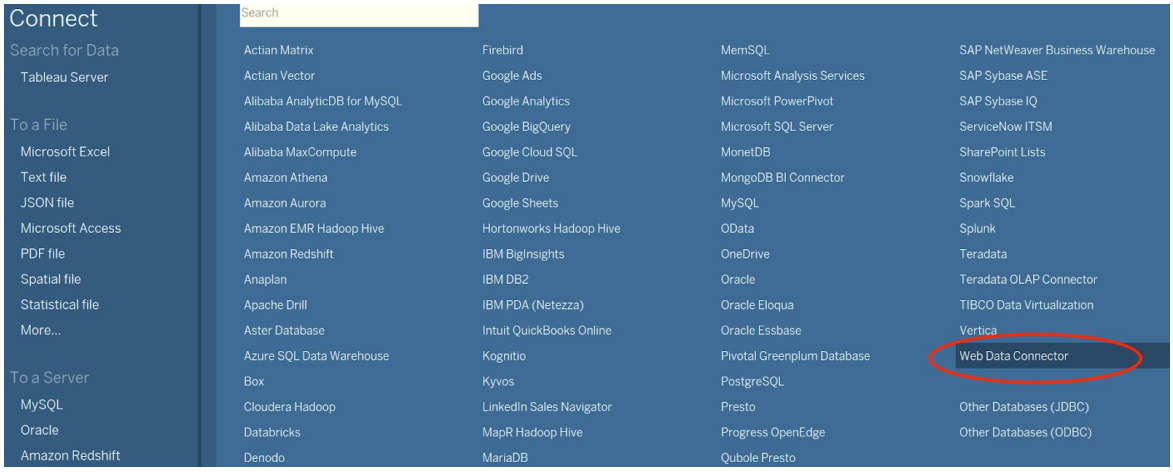


2. In the Access section, scroll down to the CORS Whitelist, and add the Tableau Connector server URL: http://tableau.interoperabilityhub.org .

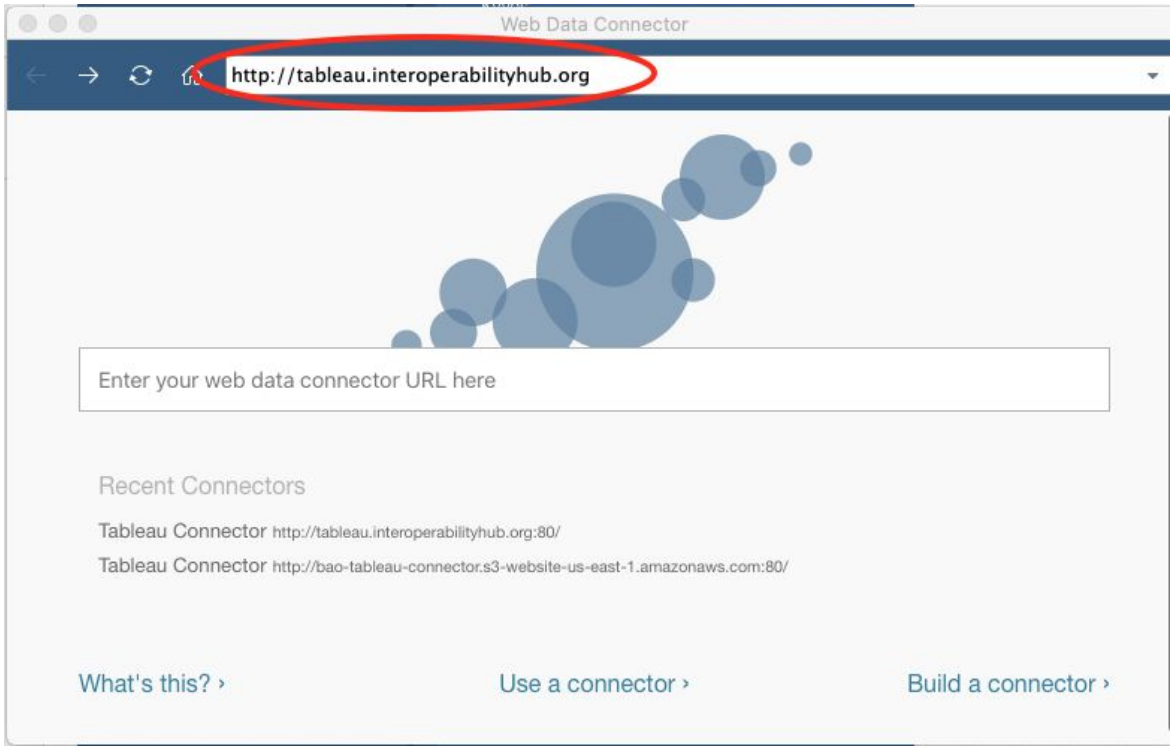


## Setting up the connector in Tableau Desktop

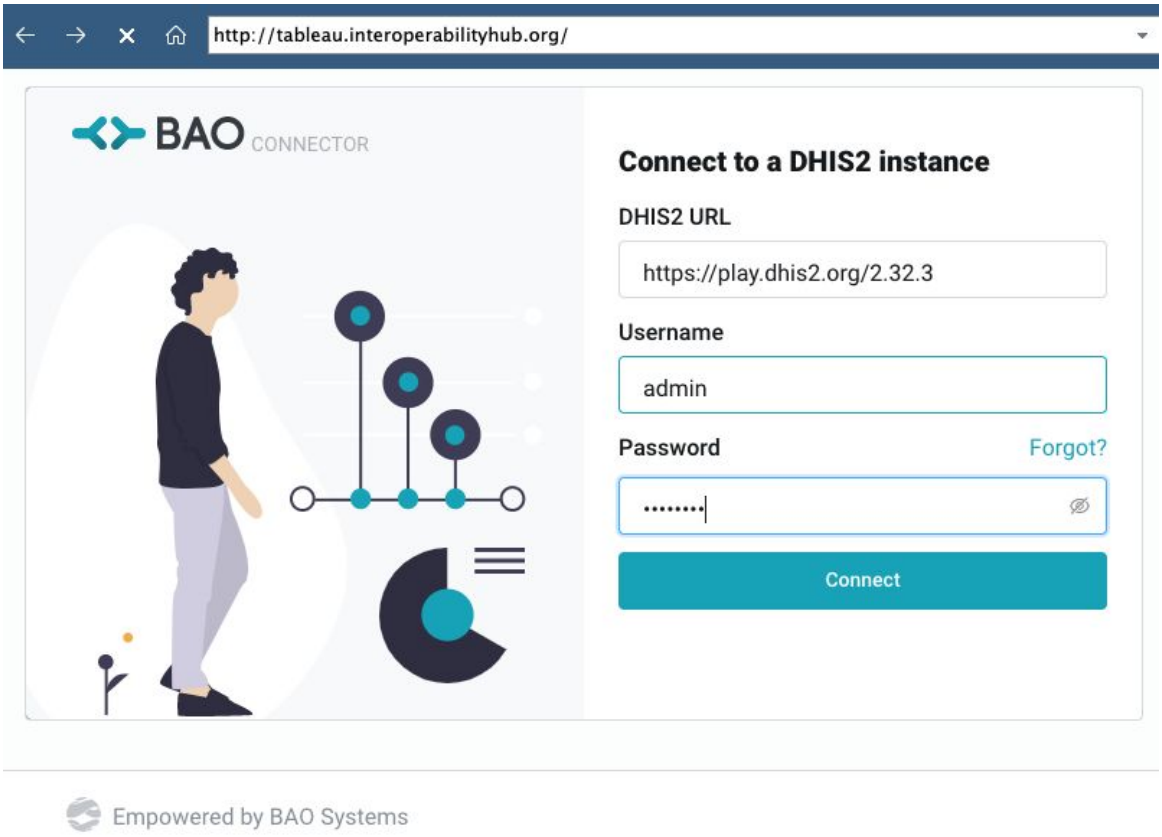
1. Open the Tableau desktop application.
2. On the left ribbon, in the section “To a server” click “More” and select the “Web Data Connector" from the list.




3. After selecting Web Data Connector, copy and paste the Tableau Connector server URL- http://tableau.interoperabilityhub.org in the web data connector URL field.



4. The Tableau connector requires you to enter the DHIS2 URL from which to pull data and appropriate credentials. Use the same user credentials that you would normally enter to access your DHIS2 instance.




5. When the connection is successfully established, the user will have access to the Tableau connector and will be able to import multiple data elements and dimensions from the DHIS2 server. The next chapter provides the data details needed by the connector.

# Data analysis

## DHIS2 Data Dimensions

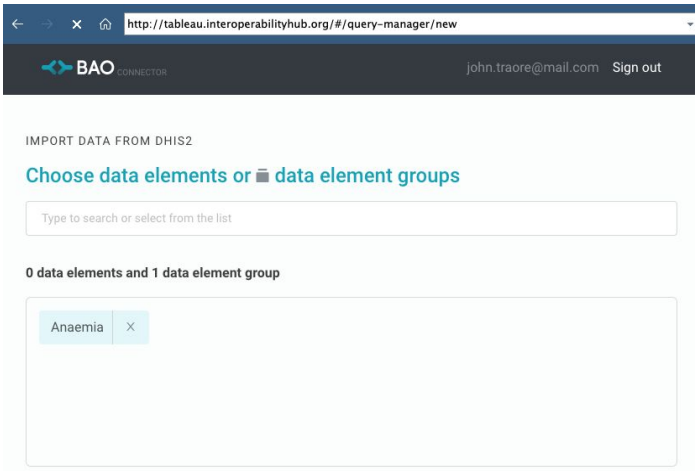
Data values in DHIS2 are described by a minimum of three dimensions. These dimensions form the core building blocks of the data model:

1. Data: data element and data element groups, the “what” dimension.
2. Period: time period in which data occured, the “when” dimension.
3. Organisation unit: geographic location, the where dimension.

Data values may also be associated with custom dimensions consisting of attributes. A common use of this dimension is to describe data values which are reported by multiple partners in the same location for the same data element and time period or to describe any disaggregation such as age, sex or facility type. In principle, it can be used as a "free-form" dimension, to describe multiple observations of the same phenomena at the same place and time. All these dimensions, and data values, are part of the data that the Tableau connector allows the import to DHIS2, and in this chapter, we will do a walkthrough on how to import these dimensions into Tableau desktop.

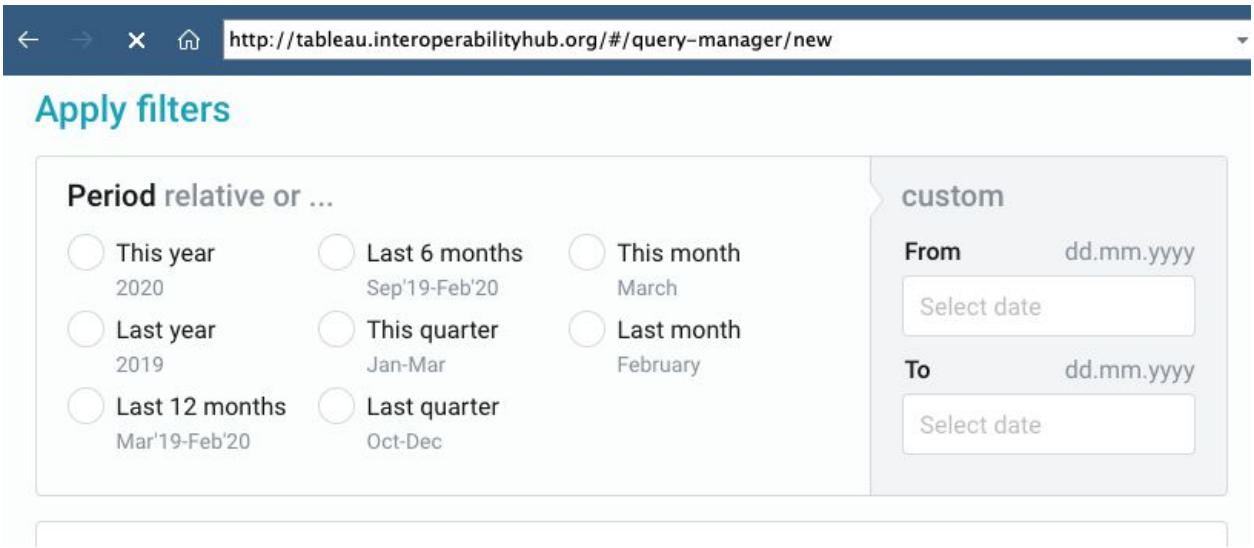
### The “what” dimension

The “what” data dimension is represented in DHIS2 by the data elements and data element groups. The user can select either single or multiple data elements/data element groups to import from DHIS2 to Tableau desktop. Once the data element group has been selected, the summary of the data elements will be displayed.



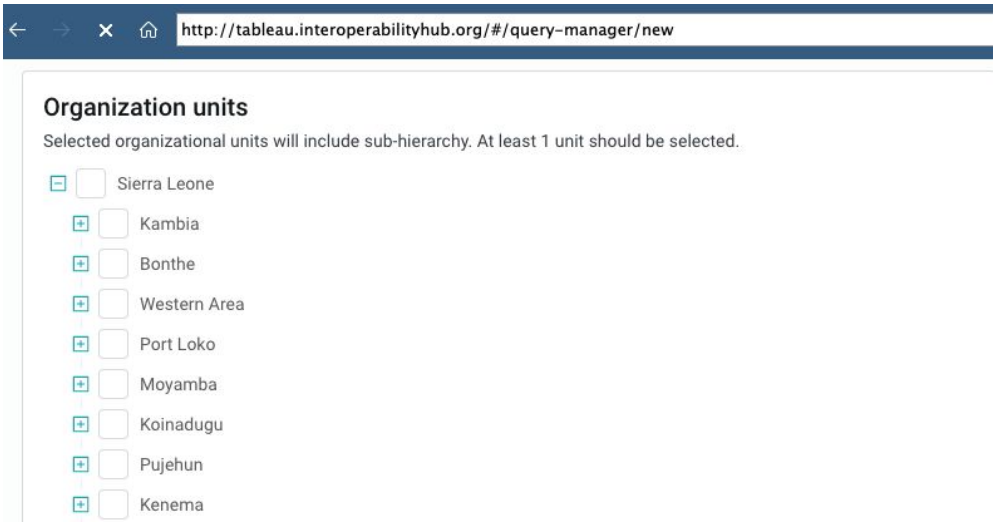
## The “when” dimension

The “when” dimension is the period. The period dimension becomes important when analysing data over time, when looking at cumulative data, when creating quarterly or annual aggregated reports, or when doing analysis that combines data with different characteristics like monthly routine data, annual census/population data or six-monthly staff data. The period dimension can be selected in the interface within defined timeframes or custom entered as shown below.




## The “where” dimension

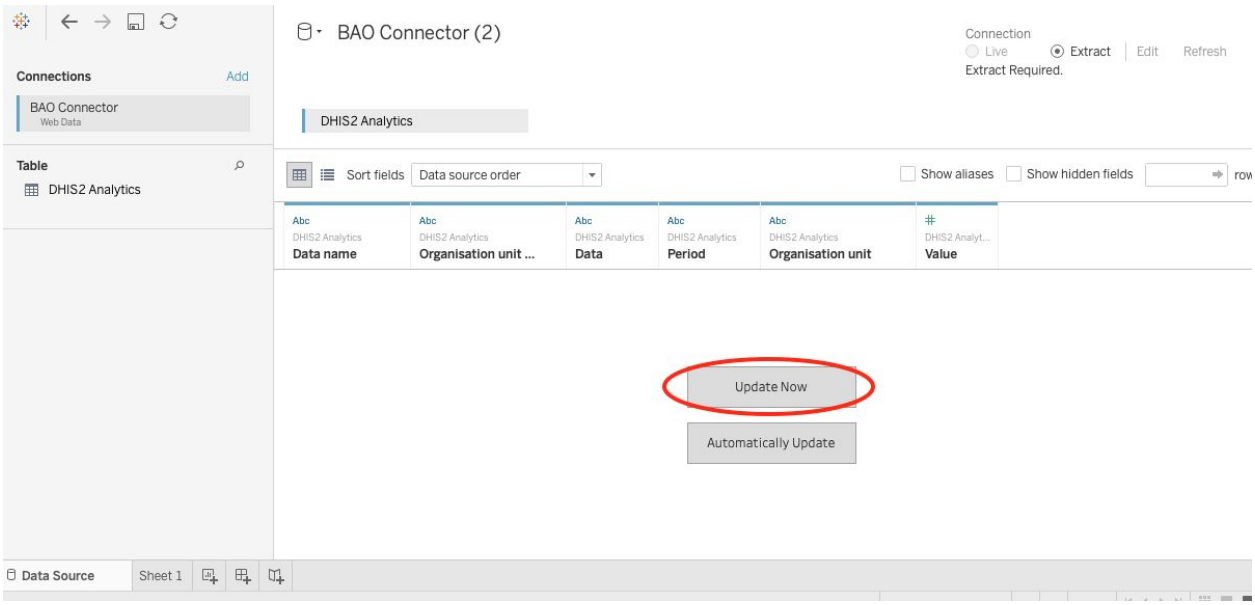
The organization units, the “where” data dimension, typically represents in DHIS2 a location. Organization units (OUs) are represented in a default hierarchy, usually the default administrative hierarchy of a country or region, and are assigned an organizational level. The connector will show all OU’s available on the DHIS2 instance. The user will be able to either select in the connector the national level, which includes by default the sub-national levels in the hierarchy or specific sub-national levels for data analysis.



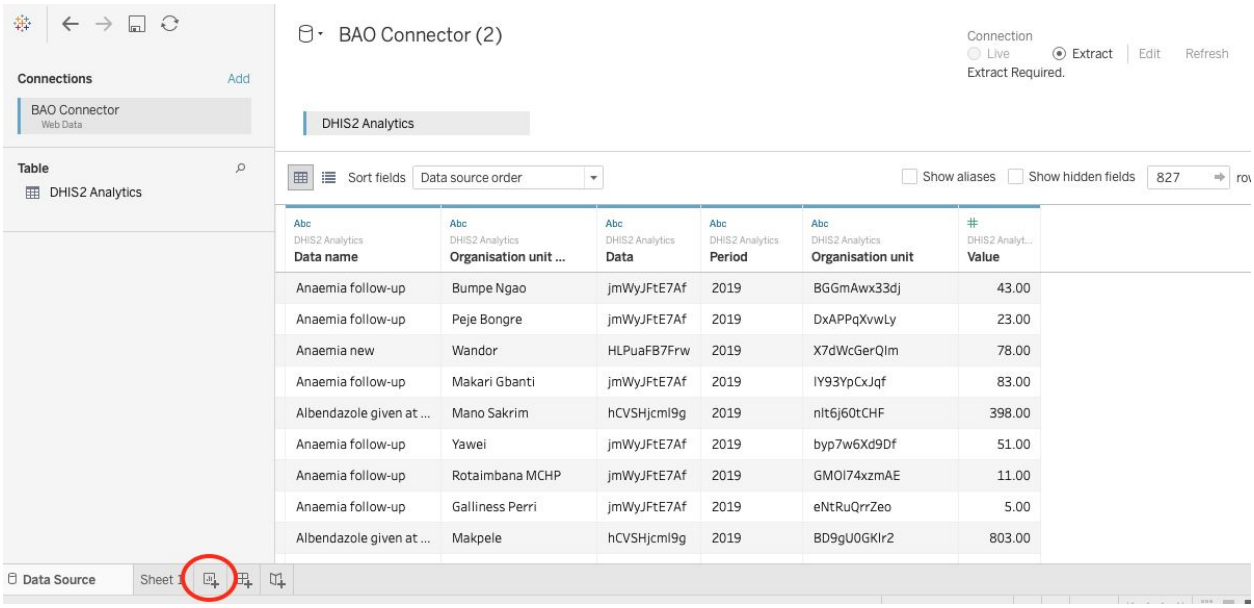

After all of the data dimensions are selected, click import to initiate the data import to the Tableau Desktop. This will save the data and its dimensions on the user's desktop and will be accessible from Tableau Desktop.

## Tableau Desktop - Data Analysis

Once the import is complete, the user is prompted to the Data Source page of the Tableau Desktop. The first step is to update the data that has been transferred via the connector by clicking Update Now,  as shown below.



All fields will now be available in the Tableau Desktop. To start producing visualizations with this data you will need to create a New Worksheet.




After the query runs all data into the sheet, the user can now add dimensions and measures to the columns, rows, and filter fields, as applicable for the required analysis.

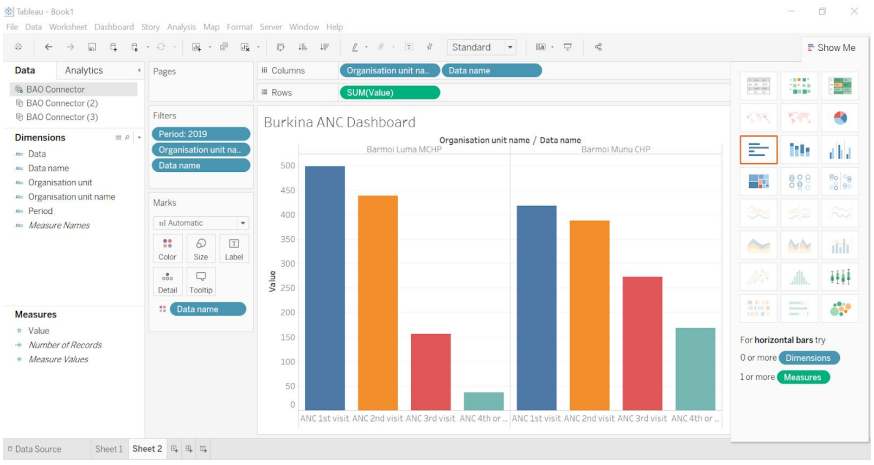
*The dimensions listed in the left-hand sidebar represent:*

**Data** = data elements UID

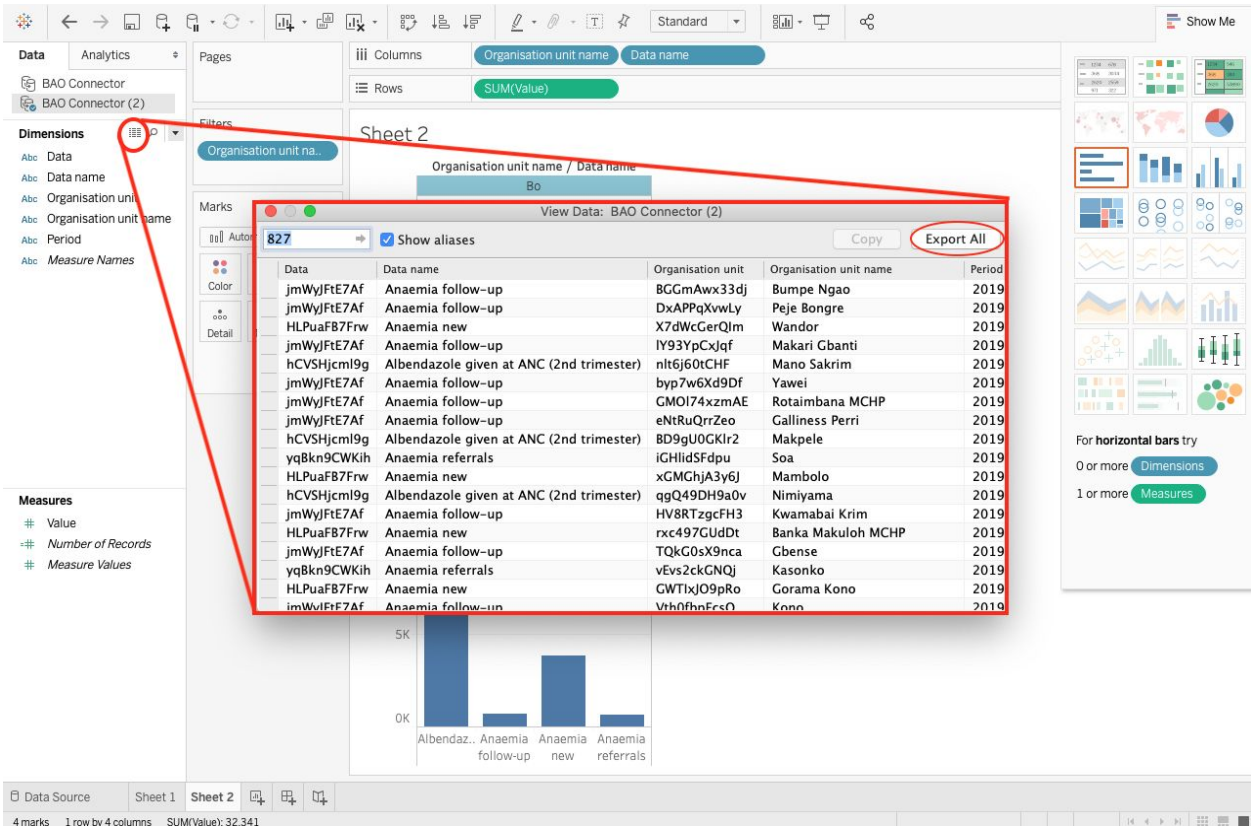
**Data name** = data elements name

**Organisation unit** = Orgunit UID

**Organisation unit name** = Organisation unit name



For a deep dive into the data source (with ID details) that are imported from DHIS2, click the View Data button, on the data dimensions panel. This data can be also exported to a .CSV format.




The Data can be represented graphically in multiple ways. The Show Me function in the Tableau Desktop allows the user to produce multiple graphical representations based on the selected data. Below, the chart selection there is guidance to let the user know how many measures or dimensions are necessary to build a graph.

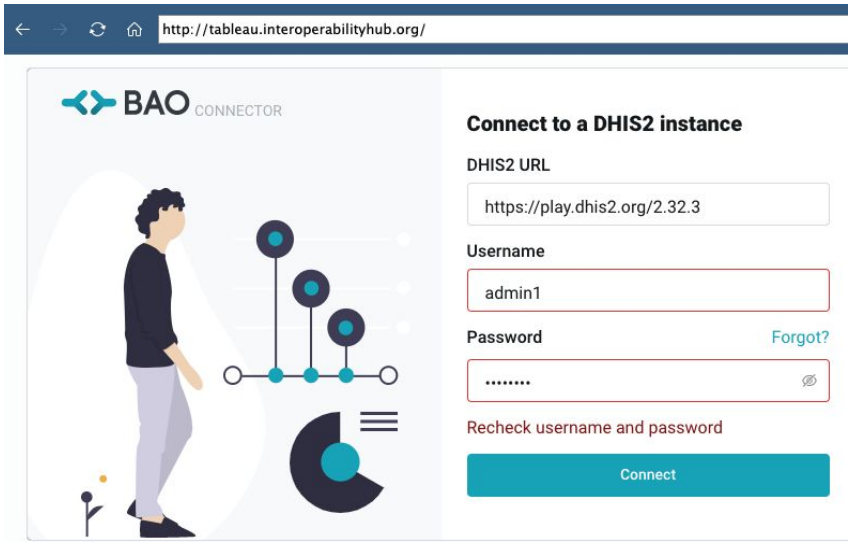
For more details on how to use the Tableau Desktop, consult the Tableau Desktop Guide available on the Tableau website.

# Troubleshooting

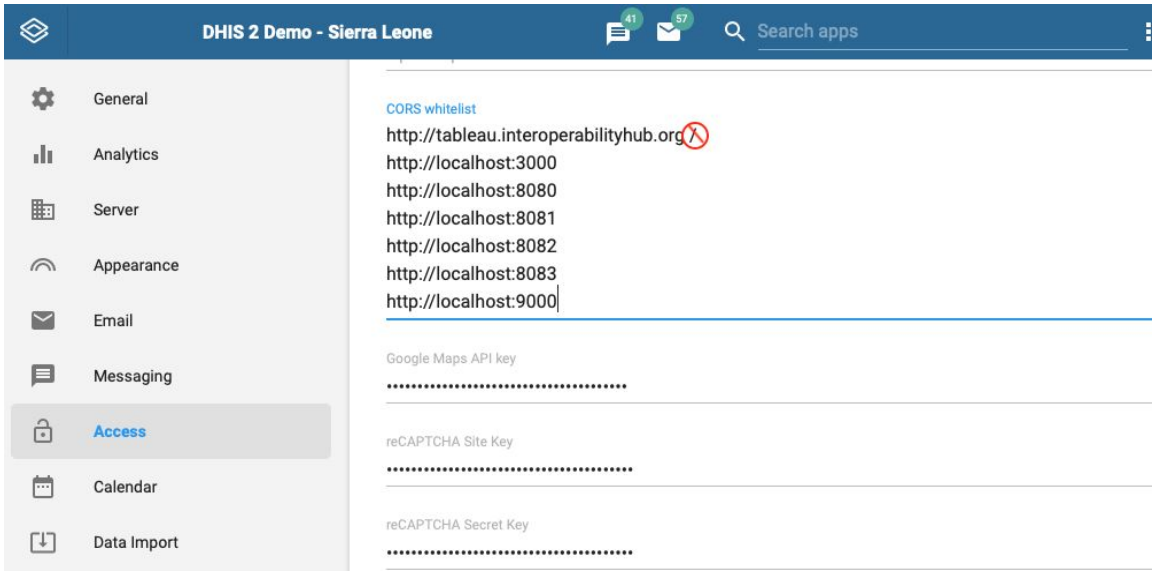
Common issues that might occur when the BAO Tableau Connector is attempting to establish a connection with DHIS2 server, include:

- Unsuccessful connection. Always check to ensure you are adding the correct DHIS2 URL.

- Incorrect credentials. Always check that you are using the correct username and password, for the given DHIS2 URL that you are using for this interface.



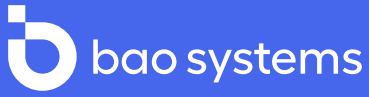
- On the DHIS2 server, items in the CORS whitelist cannot include "/" or spaces after the server url. If they are included, the connector will not work. Refer to Chapter 1.2.




## Roadmap

As with other software, there is often the case for continuing to build out new features and functionality. In each release, we will introduce innovative features to the Tableau Connector. This is what we currently have on our roadmap:

- Add more dimensions to the interface
- Apply a filter to the Data elements group to select specific categories or attributes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