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cHISU COUNTRY HEALTH INFORMATION SYSTEMS AND DATA USE

Malaria Bulletin Application

User Guide

July 2024

Country Health Information Systems and Data Use (CHISU) is USAID's flagship data and information system program to strengthen host country capacity and leadership to manage and use health information systems to improve evidence-based decision-making.

www.chisuprogram.org

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Contents

Acknowledgments i
Contents ii
Overview 1
Purpose 1
Technical specifications and installation 1
DHIS2 system requirements and application development 1
Pre-installation checklist 2
Installation instructions 3
User roles 6
Bug reporting and feature requests 6
Using the application 6
Admin functions 6
Bulletins list 7
Creating a new bulletin 8
Default generic templates 8
Template design and editing 9
Text editor functions 9
Insert dropdown functions 11
Resizing of charts and images in window 14
User settings for specific levels of access (i.e., national, subnational, etc.) 15
Updating charts before publishing 15
Importing templates from other DHIS2 instances 15
Tool navigation and use for Basic Users 16
User functions overview 16
Template downloading and viewing 16

Overview

Purpose

In 2022, the world saw an estimated 249 million malaria cases, with almost half the global population at risk.[1] Malaria bulletins are periodic publications produced by ministries of health (MOHs) to document and monitor countries' progress toward achieving targets set by their national malaria control strategies and the Millennium Development Goals for the reduction of malaria incidence and mortality. The MOHs develop the bulletins from routinely collected malaria data at both the community and the health facility levels. The Malaria Bulletin application (app) seeks to automate the process of malaria data mining, collation, and analysis and automatically produce and make available country-relevant information based on the different administrative levels in each country. The current malaria bulletin development process is largely manual, focused only at the national level, time-consuming, and error-prone. It involves many duplicative tasks from quarter to quarter with no reuse in algorithms and calculations developed to produce the bulletins.

The Malaria Bulletin app provides a generic template that can be imported into any country's health management information system (HMIS) that uses the District Health Information Software 2 (DHIS2). DHIS2, a global digital public good, is the web-based platform most commonly used as a country HMIS in more than 70 low- and middle-income countries. CHISU envisions this app will produce a generic, scalable, and robust bulletin that is configurable and adaptable to different country and subnational contexts. The app is imported as a third-party application that can connect to local malaria data sources and then be contextualized to inform the bulletin.

The audience for this guide includes both DHIS2 administrators who will install the app into DHIS2 and users of the Malaria Bulletin app.

Technical specifications and installation

DHIS2 system requirements and application development

We developed and tested the app DHIS2 version 2.40. The app should function in versions as early as 2.38, but please note that bug fixes and development are done in version 2.40. The minimum requirement for installing this app is to have an existing DHIS2 infrastructure. There is no minimum requirement for file sizes. However, as the size of the bulletins created in the app increases, you may need to increase the maximum "POST" limit on the web server, e.g., Nginx or Apache for the items to be stored in the DHIS2 data store.

[1] World Health Organization (WHO). 2024. "Malaria." WHO website: https://www.who.int/health-topics/malaria#tab=tab_1

We developed the app in ReactJS using the DHIS2 App Runtime Platform.
A development guide (README.md) is included in the repository. Visit https://github.com/JSI-CHISU/Automated-Bulletin to see the source code.

Pre-installation checklist

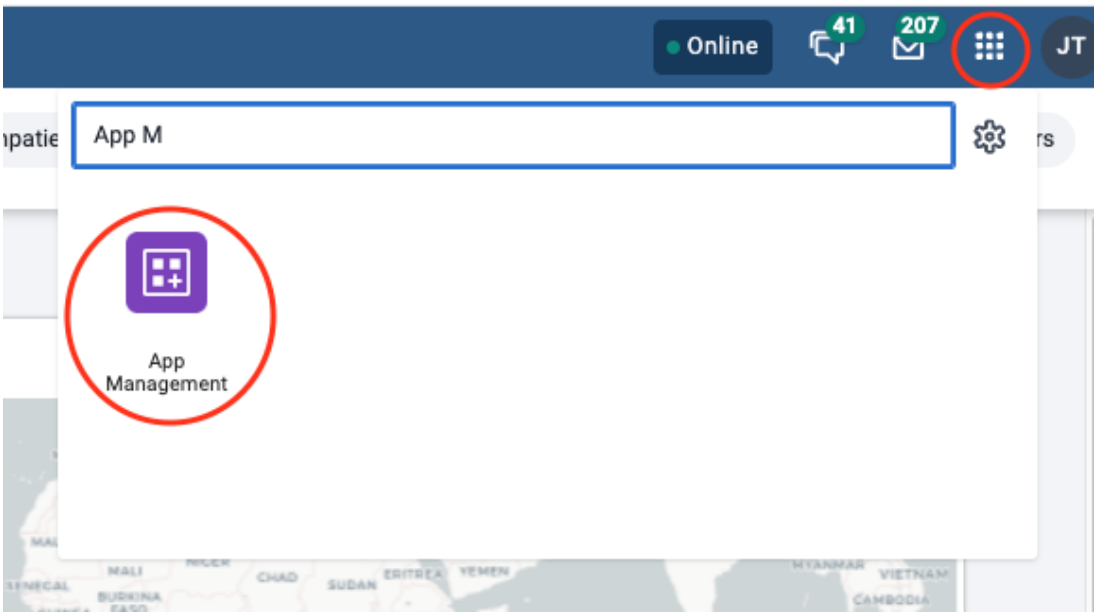
The requirements for installation are the following:

- Using a DHIS2 version that is greater than or equal to 2.40 (see note above about earlier versions)
- Being a DHIS2 user with
    - "Both Add/update user" and "add/update user role," or "Super user rights" so that they can create a user role (Bulletin_admin or Bulletin_viewer)
    - Access to App Management and ability to install DHIS2 webapps

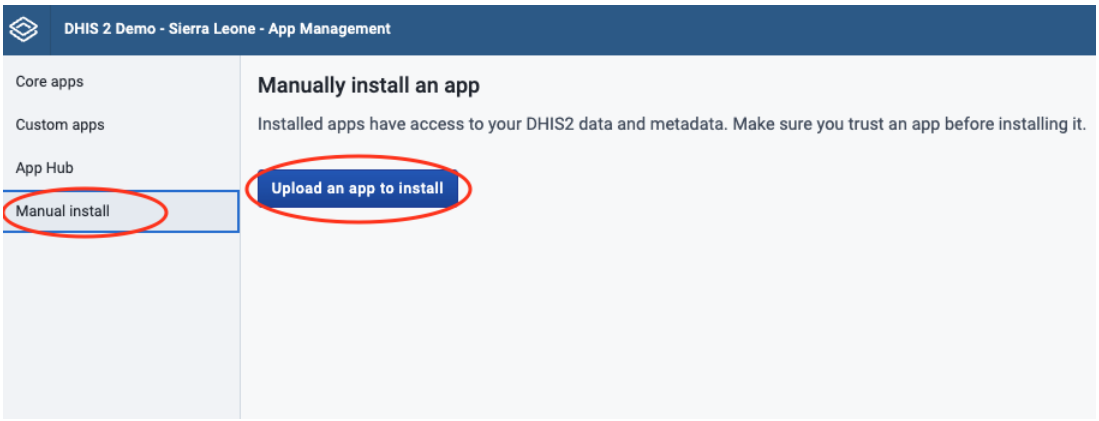
Installation instructions

1. To install the app in a DHIS2 instance, you will need to visit the malaria bulletin repository and download the zip file from the releases.

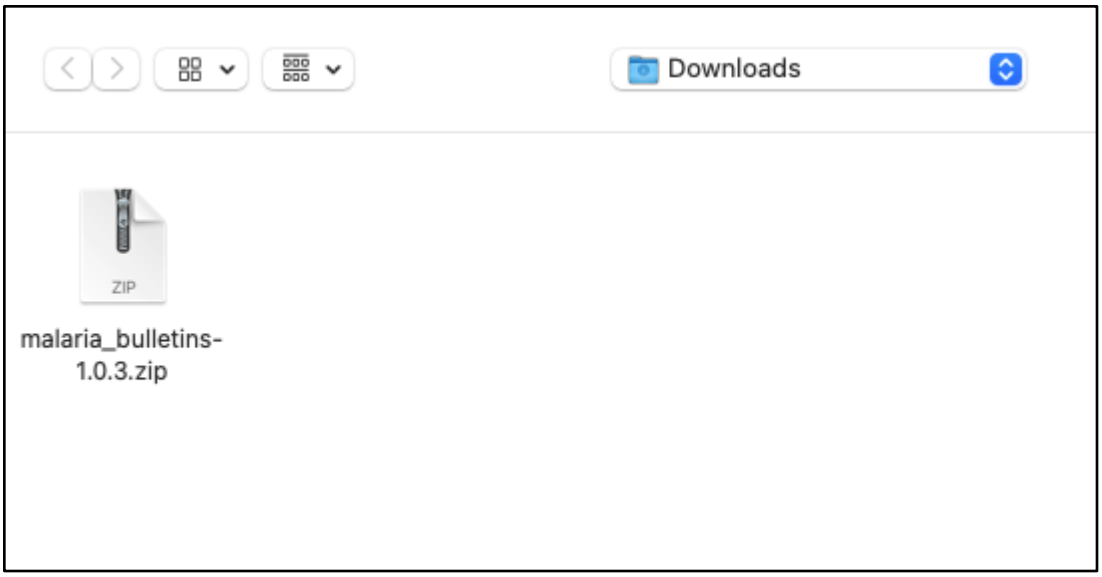
2. After downloading the Malaria Bulletin .zip file in your local directory, go to the main menu of your DHIS2 instance and search for the “App Management” application.



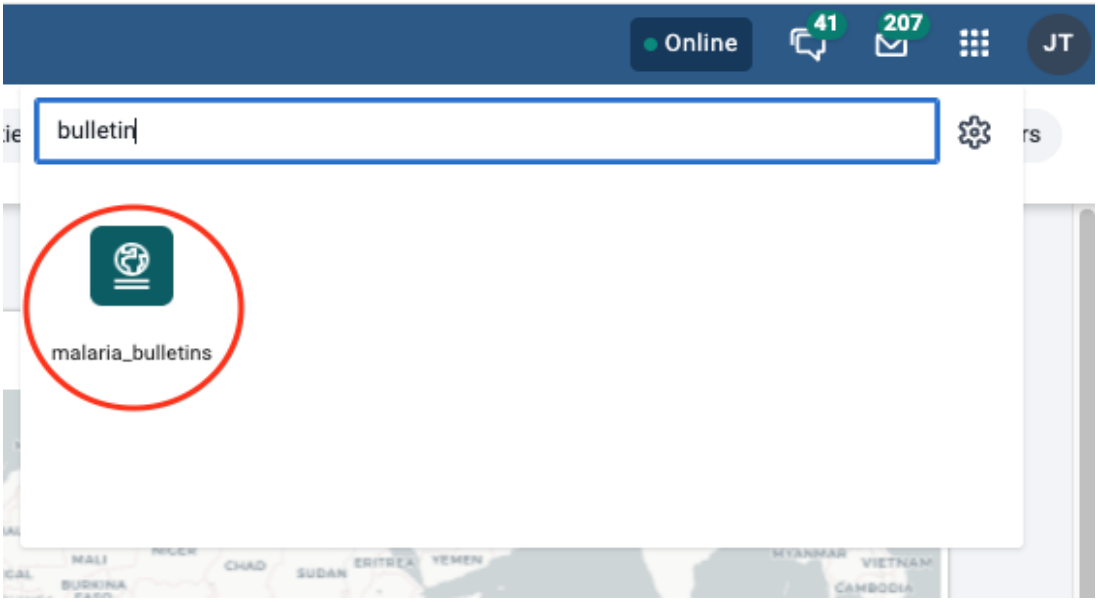
3. In the “App Management” application, go to the “Manual install” page, then click on the “Upload an app to install” button.



4. Select the .zip file from your local directory.

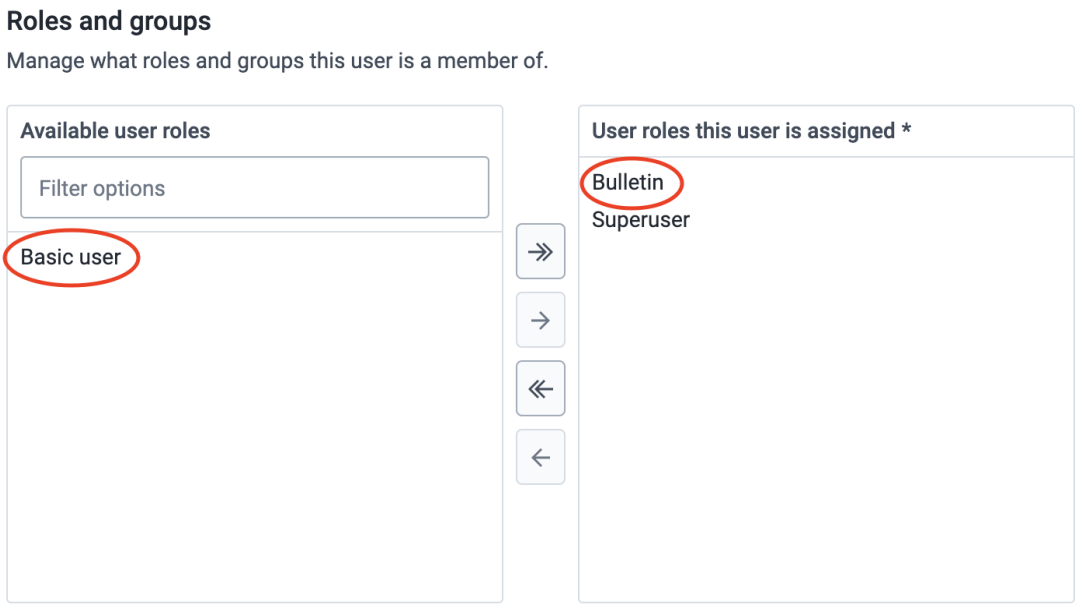


5. After uploading the file, the app will be automatically installed in your DHIS2 instance. You can return to the DHIS2 main menu and search for the Malaria Bulletin app to open it.



6. When the app is ready to use, make sure you give roles to different users according to their level of permissions.

7. Go to the DHIS2 user app and edit the concerned users or user groups as you would normally do. Then scroll down to the “Roles and Groups” sections and give the user or user group either the “Basic user” or “Bulletin” role. These roles are described in the User Roles section of this guide.



User roles

User roles (i.e., Basic User and Bulletin User) will be imported into DHIS2 upon importing the app. The previous section shows how you can select the user role for a user account.

Table 1 shows details of the two user roles and system authorities created for the app.

- The Bulletin user role has greater app access and abilities and is assigned the BULLETIN_ADMIN system authority.
- The Basic User user role has more limited access and abilities and is assigned the BULLETIN_VIEWER system authority.

When creating user accounts, select the user role(s) and appropriate organization units for data capture, data output, and search.

Table 1: Application user roles

Database user role(s)	Description and expected abilities	System authorities for user role
Bulletin	User with ability to create, design, edit, clone, publish, and delete bulletins.	BULLETIN_ADMIN
Basic User	User with ability to view and download bulletins.	BULLETIN_VIEWER

Bug reporting and feature requests

Please email bulletins@jsi.com to notify our team of any bugs or feature requests. In the future, we will set up a Github repository to capture these notifications.

Using the application

The major functions of the Malaria Bulletin app are template creation, editing, cloning, publishing, deleting, and downloading. The latter function—downloading—will be the only function available to Basic Users, whereas all other functions will be available to Bulletin Admin Users.

Admin functions

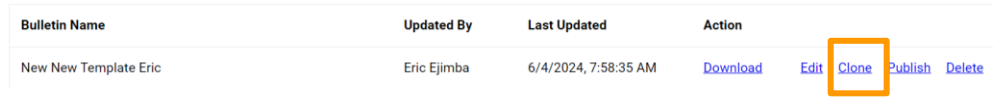
Users with the Bulletin user role, or Admin Users, are able to perform all major functions of bulletin development, including creating new templates; editing, cloning, or deleting existing templates; and publishing bulletins.

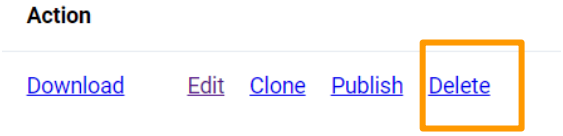
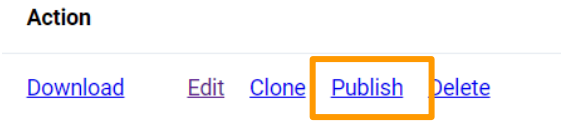
Bulletins list

When an admin enters the app, they will see a list of templates under development and published bulletins. Each of the templates and bulletins in the list will show the user who last updated it, the date and time of the last update, and a set of actions that can be taken for that template or bulletin.

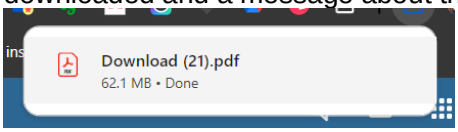
Table 2 below shows how to perform each of these functions in the app.

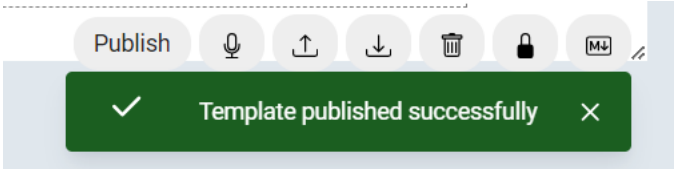
Table 2: Descriptions of template and bulletin actions

<table>
<tr>
<td>Cloning a template</td>
<td>To the right of a template, under the “Action” column, select the “Clone” button.
 

Afterward, a copy of the template will appear at the top of the bulletin list. The word “copy” will appear in the name of the new copy along with the timestamp.
</td>
</tr>
<tr>
<td>Deleting a template</td>
<td>To the right of a template, under the “Action” column, select the “Delete” button.
 
</td>
</tr>
<tr>
<td>Publishing a bulletin</td>
<td>To the right of a template, under the “Action” column, select the “Publish” button.
 

Afterward, the text window will open. Scroll down to the bottom, and select “Publish” again in the bottom right toolbar. When scrolling through, make sure to double-check the content is finalized and good to publish.

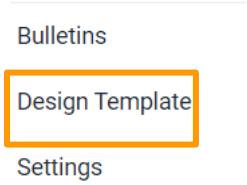
After selecting “Publish” the second time, a PDF file of the bulletin should be downloaded and a message about the published template should appear.
 

 
</td>
</tr>
</table>

	Note that once a template is published as a bulletin, that bulletin becomes static and any data charts will no longer update. The data charts will reflect what was current at the time the template was published. When an Admin selects “Edit” on a published bulletin, the status of the template will thereafter change to “Not Published,” and the user can edit the template as usual. The charts will also update to the current point in time.
Develop template using markup language	 Use this button to enable the development of the bulletin template using markup language. This is useful for developers to quickly develop templates based on markup language instead of normal word documents.

Creating a new bulletin

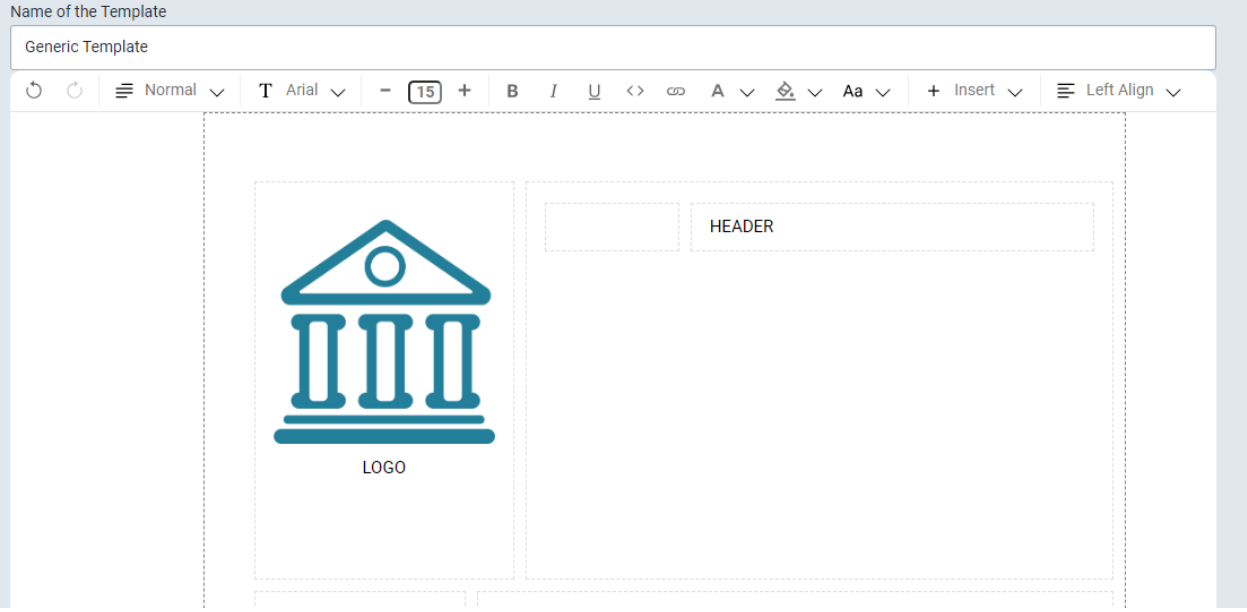
From the left-hand menu, select “Design Template.” This will open a new page with a blank template to begin populating.



Default generic templates

A generic template is available in the Github repository. To import this template into the app, download the template to a local machine then go to “Design Template.” From the Design Template page, import the generic template file using the import functionality described in the “Importing templates from other DHIS2 instances” section. Once the template is imported, click “Save Changes” and return to the bulletins list.

The bulletin list will now contain starter generic template that users can clone and modify when designing a new template. To use a generic template, “Clone” the template first to keep a clean copy available for future use. See the generic templates below.



Template design and editing

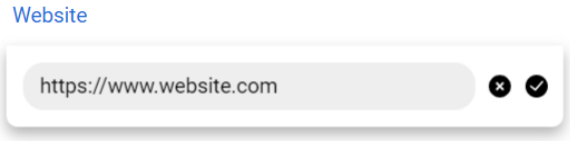
Text editor functions

When an Admin User selects “Design Template” from the left-hand bar, or selects “Edit” next to an existing bulletin from the bulletin list, a text editor window will appear. Located at the top of this window is the text formatting toolbar (shown below).

This toolbar contains many basic functions one would find in basic text editing or word processing applications. The functions of the toolbar are listed in Table 3.

Table 3: Toolbar functions

Toolbar icon	Description
Normal	**Heading styles**: This drop-down contains several text style options, including three heading styles, normal text styles, bullet and numbered lists, check lists, quote indentation, and a code block option.
Arial	**Font indicator**: This box displays the font style for the text. The drop-down contains six different fonts.
15	**Text size**: This box displays the size of the text. Click the “+” or “-” to increase or decrease size. A user can also type the desired font size into the font size box.
B I U	**Bold, italics, and underline**: Highlight text to format and then click the appropriate format option for the desired output. Shorthands also work in the application: Ctrl + B for bold, Ctrl + I for italics, and Ctrl+U for underline.

	Code block insert: To insert code or a code block, click the code block button and then paste your code into the text window.
	Hyperlink: Highlight text to format with a hyperlink. Click the hyperlink button, and paste the URL in the box that appears. 
	Text color picker: Text color can be selected in three ways. First, highlight the text to be formatted. Then, from the drop-down menu: 1) select a preset color, 2) paste the hex code for a specific color, or 3) select a color from the palette.
	Highlight color picker: Text highlight color can be selected in three ways. First, highlight the text to be formatted. Then, from the drop-down menu: 1) select a preset color, 2) paste the hex code for a specific color, or 3) select a color from the palette.
	Font effects: This drop-down contains additional font effects including strikethrough, superscript, subscript, and clear formatting. Highlight the text to be formatted and click an option from the drop-down menu for the desired output.
	Additional functions menu: This drop-down contains non-text formatting actions that can be added to the template, such as inserting an image, table, and page breaks, among others. This menu is explained in more detail later in this guide.
	Text alignment and indentation: This drop-down contains options for alignment, including left, right, center, justify, start, and end. There are also outdent and indent options.

Insert dropdown functions

The “Insert” dropdown in the text editor toolbar contains options for adding a variety of additional content into the template, including charts and maps, column sections, and page breaks, among others. Table 4 describes each of the “Insert” options available to users.

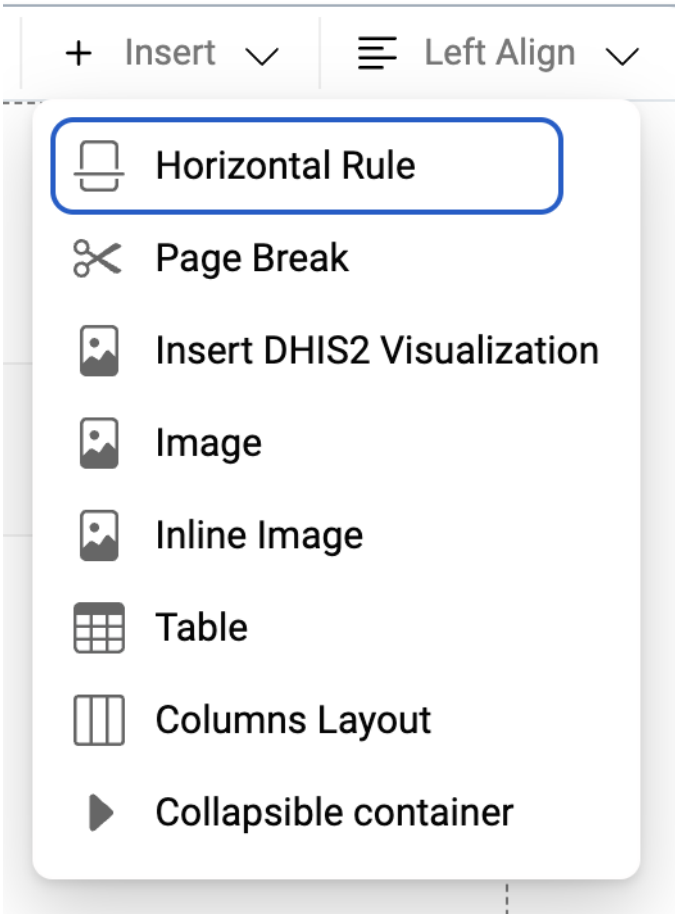
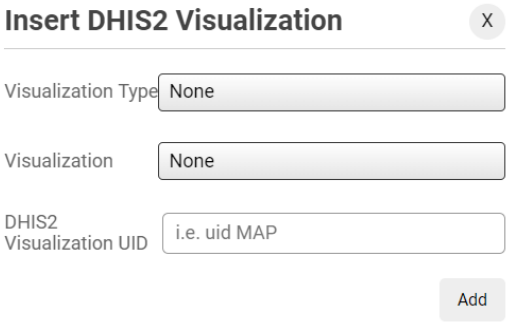
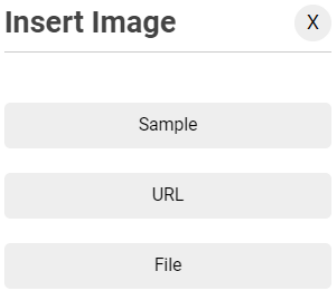
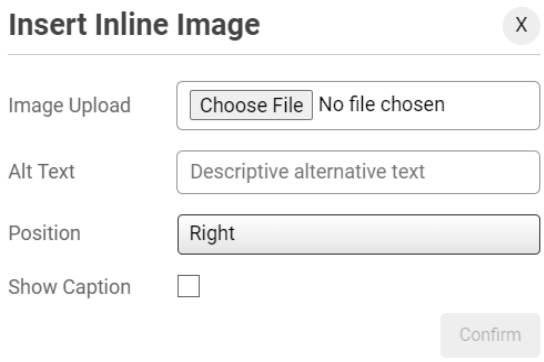
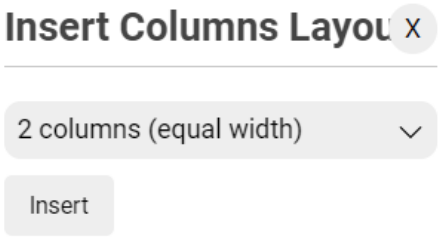
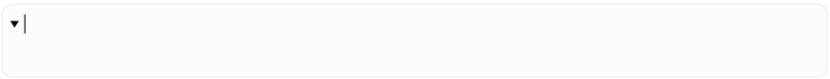


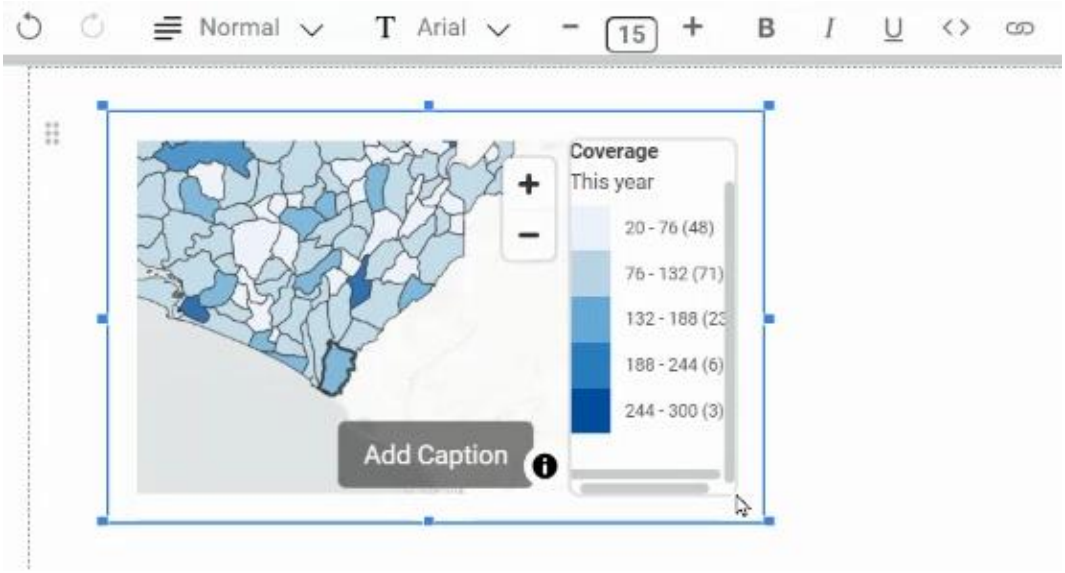
Table 4: Insert option functions

Insert option	Description
Horizontal Rule	This option will input a light gray horizontal line on the page.
Page Break	This option will input a page break on the page, indicating the start of a new page.
Insert DHIS2 Visualization	This option will open up a chart chooser, where the user can select a visualization to add to the page.  Before adding a chart to the text editor, consider your audience and the organization unit level of data to be shared. If a chart is set to "By user org unit," the chart will filter organization units to reflect the organization units configured for the Admin user account. If a particular geography is important for the chart, select a specific organization unit from the hierarchy.
Image	This option allows the user to input an image on the page. Users can insert a sample image, an image from a URL, or upload an image from their computer. 
Inline Image	This option allows the user to input an image and specify its position on the page.

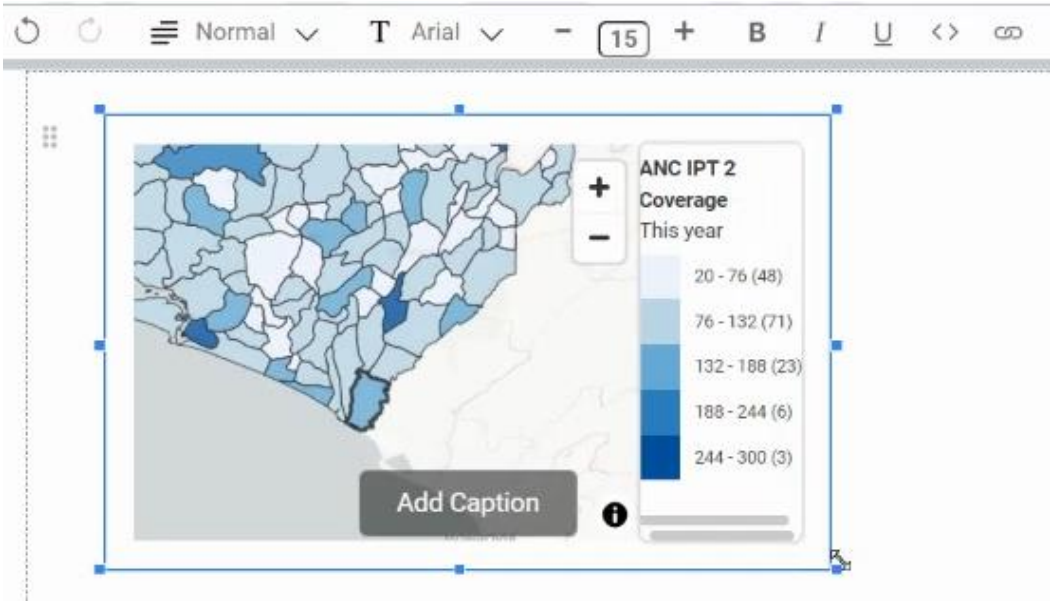
	
Table	This option will input a table based on the number of rows and columns indicated by the user.
Columns Layout	This option allows the user to select a column layout for page content. 
Collapsible container	This option allows the user to add content in a collapsible container. 

Resizing of charts and images in window

To resize a chart or image in the text window, hover the cursor near an edge or corner of the image until the arrow icon (↖) is shown. Then, left click until the light blue lines appear around the image.



Next, hover the cursor over one corner of the light blue bow until the double-headed arrow icon (⤡) appears. Next, left click, hold, and drag outward until the image meets the desired size.



User settings for specific levels of access (i.e., national, subnational, etc.)

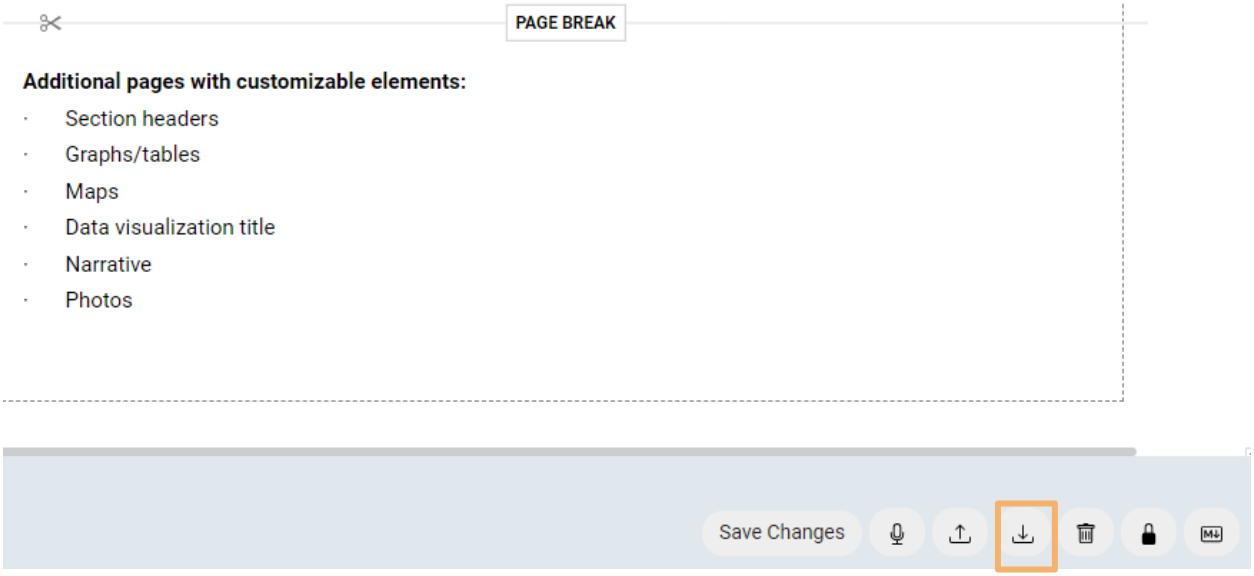
The data available in the charts, tables, and maps pulled into the bulletin template will be viewable based on the permissions associated with each user's native DHIS2 permissions. Therefore, if a user does not have permission to view certain data, the data will not be viewable in the charts within the editable template. Before publishing a template, consider your audience and the organization unit level of data to be shared. If a chart is set to "By user org unit," the chart will filter organization units to reflect the organization units configured for the Admin user account. If a particular geography is important for the chart, select a specific organization unit from the hierarchy for the chart. Once a bulletin is published, the data in the PDF of the bulletin is static and therefore viewable by anyone who has access to the Malaria Bulletins app.

Updating charts before publishing

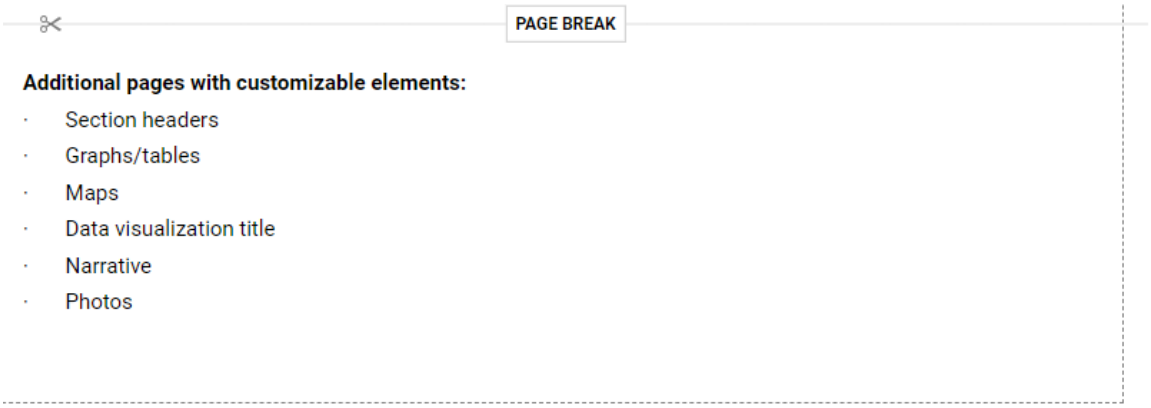
Charts, tables, and maps in a template will keep updating until the template is published as a bulletin. Once the template is published, all content becomes static and charts and maps will no longer update with new data. All data in charts or maps will reflect what was current at the point in time that the bulletin was published. When an Admin selects "Edit" on a published bulletin, the status of the template will change to "Not Published," and the user can edit the template as usual. The charts will also update to the current point in time.

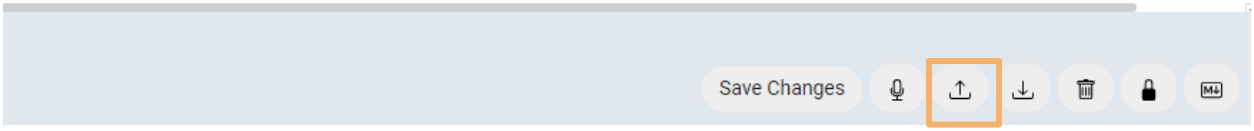
Importing templates from other DHIS2 instances

Templates can be downloaded from the text editor by clicking the down arrow at the bottom of the text editor.



This will generate a file in your local directory that ends in ".Lexical"; this template can be imported into other DHIS2 instances that have the Malaria Bulletins app installed. To import this template into the app, go to the Design Template page to start a new template. Click the up arrow at the bottom of the text editor and select the downloaded ".Lexical" file from your local directory. The template will then appear in the text editor.





Tool navigation and use for Basic Users

User functions overview

The functions available to Basic Users are limited to template viewing and downloading.

Template downloading and viewing

Downloading a bulletin	To the right of a template, under the “Action” column, select the “Download” button. **Action** Download

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