Argus user guide

April 2019

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CONTENTS

1. Introduction

1.1 Purpose of the document

This document describes all the features of Argus Android client and Argus web platform. It is designed for end users and supervisors.

Detailed instructions to install, maintain and troubleshoot problems on Argus Android client and Argus web platform are available in the document “Argus installation and administration”.

Leaflets and posters are also available for the end users to provide the main instructions on how to use Argus Android client and Argus web platform.

1.2 Solution overview

The World Health Organization has developed Argus, an open source IT tool to support public health surveillance for early detection and response. It uses Short Message Service (SMS) technology for the transmission of information between the local healthcare facilities and all levels of the public health surveillance system via a mobile application (Figure 1). A web platform complements the application for data management and analysis (Figure 2).

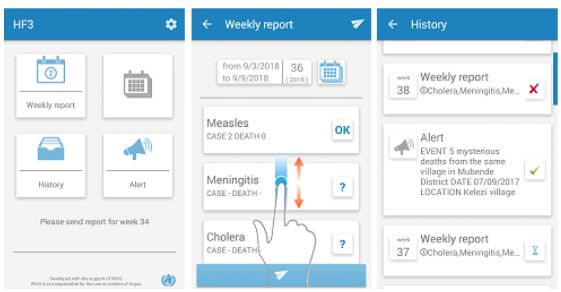


Figure 1. Argus Android Client for mobile phones

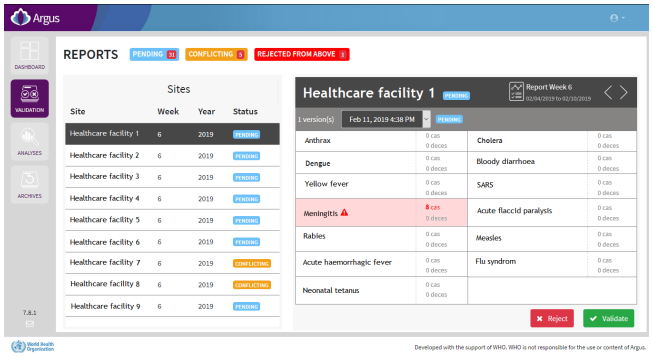


Figure 2. Argus web platform

Argus improves routine reporting quality and speed by reducing dependency on paper forms. It allows administrators to easily set up the public health events to be under surveillance, the variables to be collected, and the different levels of the public health surveillance system in charge of data validation and data analysis.

Argus is mainly designed to manage aggregated weekly reports of priority public health events. It also manages aggregated monthly reports of public health events, and alerts of unexpected public health events.

In practice, a central server located in the country collects the data sent by the healthcare facilities through SMS (Figure 3). The central server returns SMS to the healthcare facilities to acknowledge the reception of the data and posts the information on the internet through the Argus web platform for data management and analysis. When an alert of an unexpected public health event is received, this alert is forwarded to the personal mobile phone of a pre-specified list of contacts.

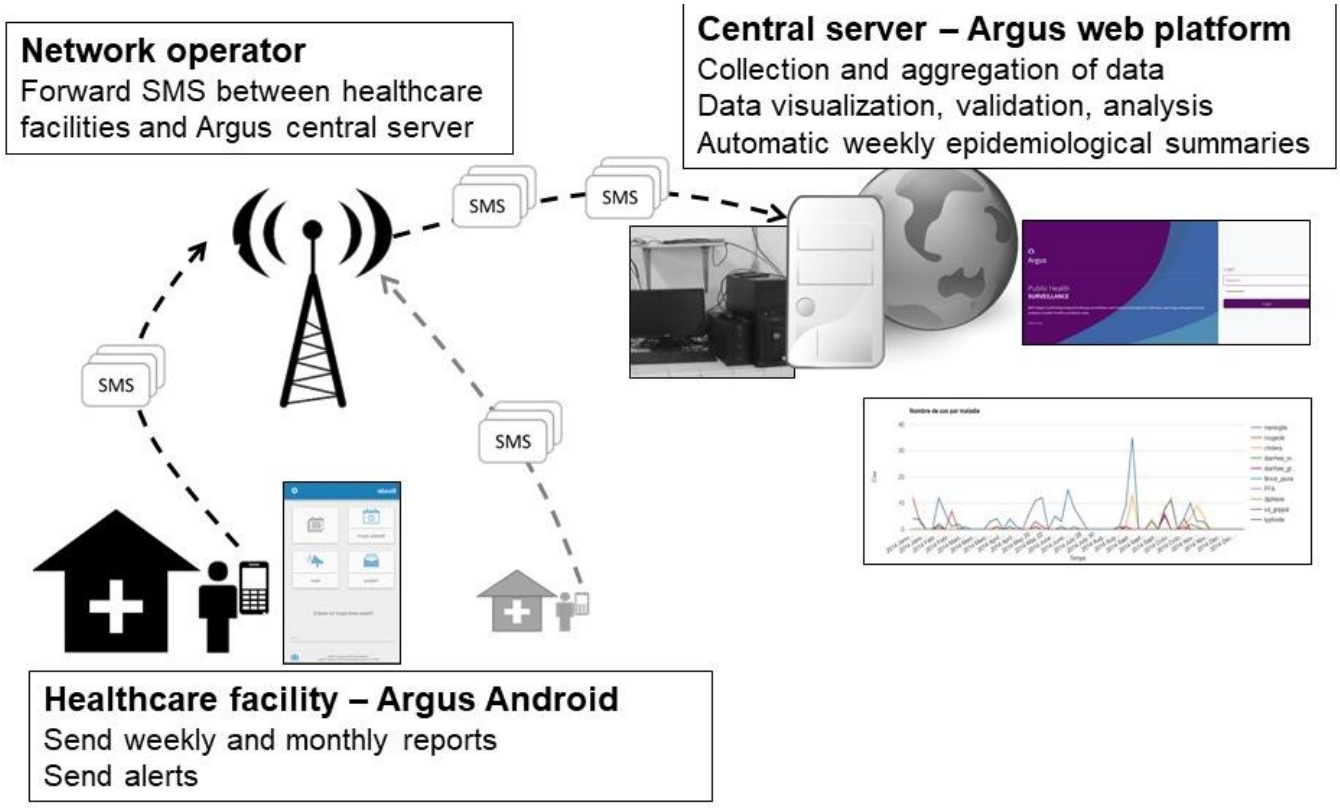


Figure 3. Flow of information with Argus

2. Argus Android client

Argus Android client enables healthcare facilities to:

- send through SMS their weekly aggregated report to the public health surveillance system;
- Send through SMS alerts of serious or unusual public health events to their supervisors.

To access the application, tap on its logo .

2.1 Home screen

The home screen is the center of the application (Figure 4), it provides access to the several functions offered by Argus Android client. Once installed, the application needs to be synchronized with the server (see section 2.6).

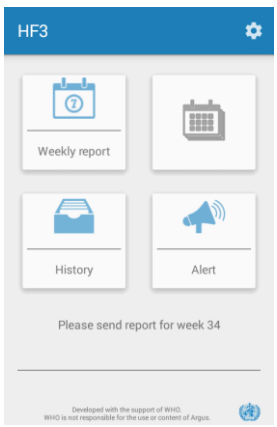


Figure 4. Argus Android Client - home screen

The home screen provides access to 5 functions:

- The top left icon allows sending weekly reports.
- The top right icon allows sending monthly reports.
- The bottom right icon allows to send alerts.
- The bottom left icon provides a history of reports and alerts sent and their reception status.
- The top right icon in the blue bar provides access to the settings.

Reminders and notifications appear at the bottom of the screen.

2.2 Weekly reports

The weekly report screen (Figure 5) is used to send weekly aggregated public health surveillance reports.

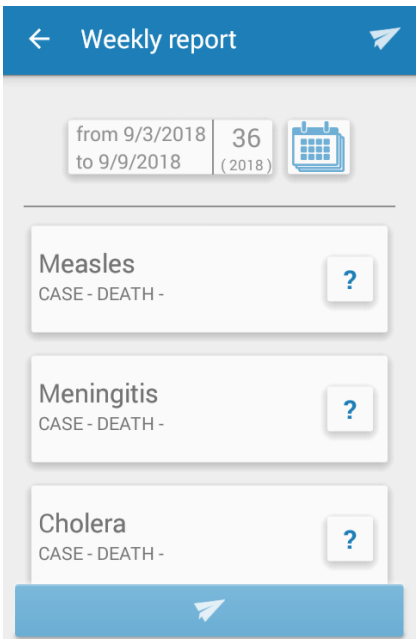


Figure 5. Weekly report screen

Before starting to fill the report, it is necessary to check the week for which the report will be sent. By default, the previous week is shown.

To change the week to be reported tap on the calendar (Figure 5) and select any day of the week to be reported (Figure 6).

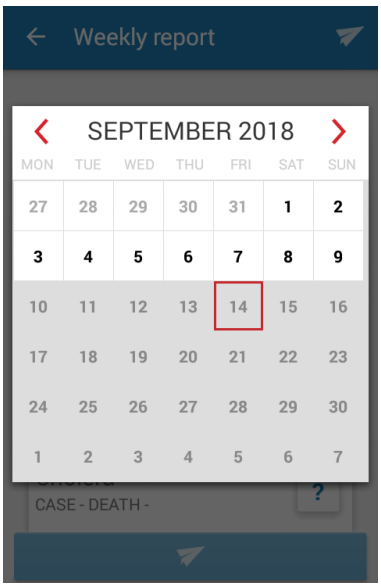


Figure 6. Selection of the week to be reported

To fill in the report: tap on each disease and condition to be reported (Figure 5) and enter the figures for each variable to be reported (Figure 7).

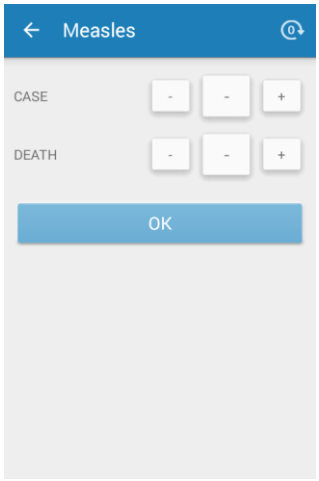


Figure 7. Fill in information for a specific disease or condition to be reported.

To fill in information (Figure 7), two modalities are available:

- Tap the keys « - » and « + »  .
- Tap the middle box to display a keyboard. 

If the value is "0" for all variables, the  icon on top right corner (Figure 7) is a shortcut to put 0 to all variables.

Once all values are entered for a specific disease or condition, tap "OK" to return to the list of diseases and conditions to be reported. You need to fill information for all diseases and conditions, you may need to scroll the screen to see all diseases and conditions (Figure 8).

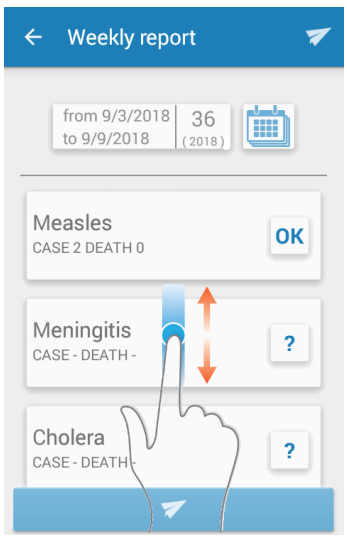


Figure 8. Fill information for the diseases and conditions to be reported.

Once information is filled for all diseases and conditions, to send the report: tap on the send button located at the top right corner or at the bottom of the screen (Figure 8). This will display a summary of the report to be sent. Check the accuracy of the information, if the information is fully correct press “SEND” (Figure 9).

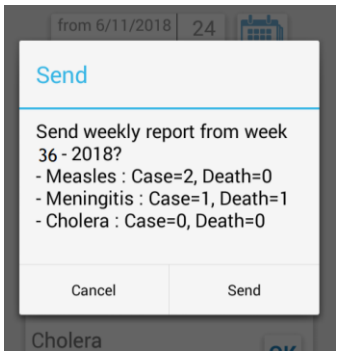


Figure 9. Summary of the weekly report to be sent.

When you send the report, a message “Weekly report sent” appears to confirm that the report has been sent (Figure 10).

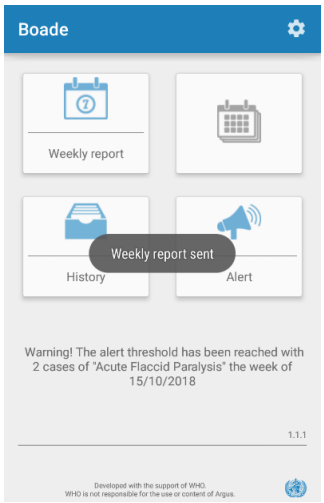


Figure 10. Report sent.

In practice, when a report is sent, Argus Android client sends to the server one SMS per disease and condition. This may lead to some delay in the full reception of the report, you need to go to the History screen to check the report has been well received (see section 2.5).

If you made a mistake on a report with Argus Android client, you can correct it by sending a new report for the same week. When trying to do so, the following message will appear to remind you a previous version was already sent: “Warning, the report for this date was already sent”. The new version will replace the previous version on the Argus server.

If a report was sent but not fully received, press the red cross in the History screen to resend it (see section 2.5).

2.3 Monthly reports

Functionalities and instructions are identical to the weekly reports, see section 2.2.

2.4 Alerts of serious or unexpected public health events

The alert screen (Figure 11) is used to send alerts of serious or unexpected events to the health authorities. Once an alert is received by the server it will be forwarded to the personal mobile phones of the supervisors.

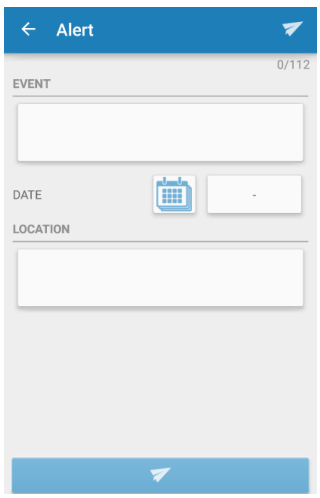


Figure 11. Alert screen.

To fill an alert, tap on the boxes to provide the requested information. You can let some variables blank. When all the information is provided, tap on the send button at the top right corner or at the bottom of the screen to send the alert. This will display a summary of the alert to be sent. Check the accuracy of the information, if the information is fully correct, press “SEND” (Figure 12).

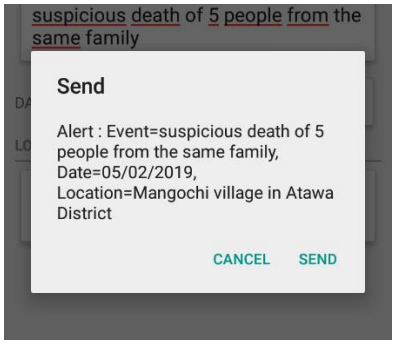


Figure 12. Summary of the alert before sending.

The number of characters that can be sent in an alert is limited. A counter is present at the top right of the screen (Figure 13). If the number of characters is exceeded, the counter at the top right of the screen turns red. It is necessary to shorten the text to be able to send the alert.

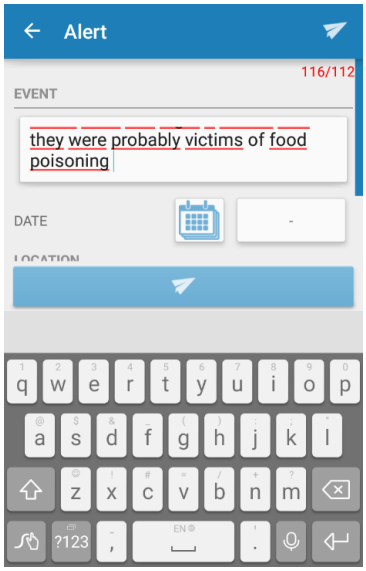


Figure 13. Alert screen with too many characters.

Accented and special characters are not allowed (e.g. :, !, -, é, è, ô, _, à).

2.5 History

The History screen displays in chronological order all the reports and alerts sent. It provides:

- their reception status; and
- warnings that alert thresholds have been crossed.

Icons provide information on the reception status of a report or alert (Figure 14):

- ✓: the report or alert has been fully received by the server;
- ⧗: the report or alert is currently being sent, confirmation of the reception is pending;
- ✗: the report or alert has not been fully received, it has to be sent again.

When a red cross appears, the report or alert needs to be sent again, to do this: tap on the red cross.

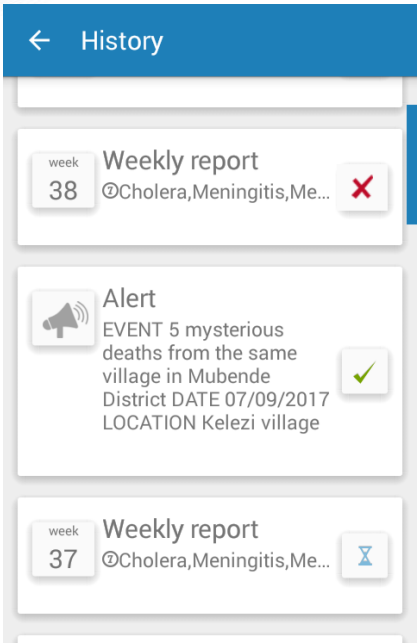


Figure 14. History page with reception status of sent reports and alerts.

A threshold can be defined for a specific variable (i.e. "value") of a specific reported disease or condition ("disease"). Its purpose is to notify users when the threshold of a reported variable has been reached for a specific disease, in a specific area, for a specific week or month. This can help in timely identifying a situation presenting a public health risk.

If a public health event exceeds an alert threshold, a message is sent to the application. This is displayed in red in the history (Figure 15).

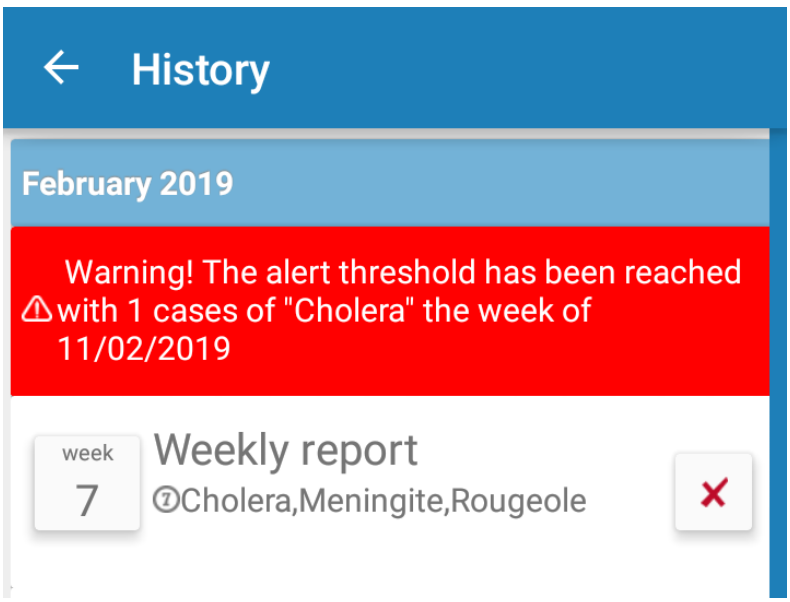


Figure 15. Alert threshold reached for the number of cases of Cholera.

2.6 Configuration

The default password to access the Settings is: “argus”. You can modify it in the settings. Fom the application home screen, tap on the top right icon to access the settings screen.

Each Argus Android Client application will exchange SMS with a predefined phone with Argus Android Gateway installed. At first, it is needed to enter in the settings the “Phone server number” (Figure 16), this is the number in international format (e.g. +4100000000) of the specific Argus Android Gateway that will exchange SMS with the Argus Android Client application.

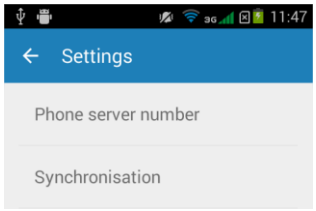


Figure 16. Argus Android Client settings screen

You can select the language to be used by Argus Android Client, note that it does not apply to the language of the diseases/conditions to be reported. Other options in the settings should not be used as they are mainly experimental.

Each Argus Android Client application needs to be synchronized with the Argus Server:

- In the Argus Android Client “Settings” screen, tap “Synchronization” (Figure 16).
- In the synchronization screen, tap the “Sync” button.
- The synchronization starts, it can take up to one.
- Once synchronization is done, Argus Android Client will restart automatically and will be ready to send reports and alerts.

2.7 Common issues and solutions

- **The phone does not turn on**: plug the phone, let it charge for 10 min, try to turn it on again.
- **The message « No network available » is displayed**: check the mobile phone signal at the top of the screen; if there is no signal: send the report later or from a different location. If there is a signal: it is likely that there is no credit left, contact your supervisor.
- **The message « Your phone number isn’t declared in the system » is displayed**: contact your supervisor.
- **The message «Complete all required fields » is displayed**: there is missing information for at least one disease; complete the report.
- **You have sent a report or an alert containing errors**: send a new report or alert to replace the previous one.

- **Despite multiple attempts to send the report, a red cross still appears in the history screen**: contact your supervisor.
- **The message « Maximum character number exceeded, » is displayed before sending an alert**: there are too many characters in the alert, you need to remove some text. The number of authorized characters appears on the top right corner of the alert screen.
- **A red cross is displayed for an alert in the history screen**: contact your supervisor.

3. Argus web platform

3.1 Logic and structure of the system

3.1.1 Structure of the system

The main structure within the Argus system is based on a tree hierarchy of "sites". This hierarchy typically represents the geographical and/or administrative subdivisions within the country (Figure 17):

- Report and alert data are sent from healthcare facilities at the bottom of the hierarchy (peripheral sites).
- Data then flow up through the upper level sites (e.g. first through the district, then the region, then it reaches the central level).
- At each level of the system, data from weekly or monthly reports are aggregated and validated, for example:
    - The district will validate or reject reports from its "child" healthcare facilities (i.e. healthcare facilities in its area of responsibility).
    - An aggregated report for the district is created and is to be validated or rejected by the parent region (i.e. the region in charge of the district).
    - An aggregated report for the region is created and is to be validated or rejected by the central level.

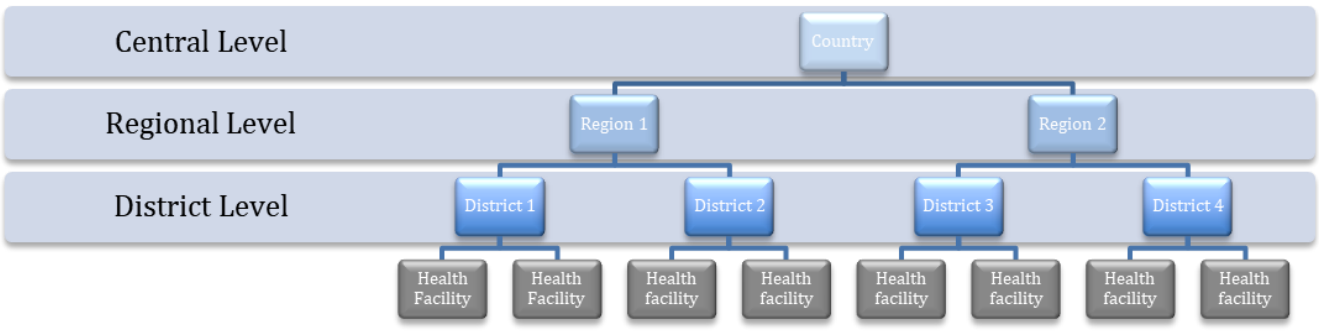


Figure 17. Example of structure of the Argus system.

The number of levels in the system is not limited and depends on the country.

3.1.2 Responsibilities at each level

The peripheral sites (usually healthcare facilities) are in charge of sending alerts and weekly or monthly reports through SMS using Argus Android Client application. The sites at the levels above healthcare facilities are in charge of:

- validating or rejecting received reports from their child sites (for example in Figure 16 District 1 and District 2 are the child sites of Region 1);
- reviewing the data analyses for their area of responsibility to check if there is any epidemiological threat requiring a rapid response.

3.1.3 New version of a report

At the first intermediate level (e.g. district level in Figure 16), a new version of a report is created when the peripheral level (i.e. healthcare facility) sends a modified version of a report for a given week.

At the other levels (e.g. regional and central level in Figure 16), a new version of an aggregated report is created when reports are validated or rejected at the levels below.

3.1.4 Status of reports and validation cascade

Weekly reports on Argus web platform can have five status:

- PENDING: a new report is available and needs to be validated or rejected.
- VALIDATED: the report is validated.
- REJECTED: the report has been rejected.
- CONFLICTING: since last validation or rejection, a new version of the report has been received.
- REJECTED FROM ABOVE: an aggregated report containing this report has been rejected at an above level.

When a new version of a report is created (see section 3.1.3), the status of the report will be changed as follows:

- If the report status was “pending”: the new version will replace the previous version that will never again appear on the platform.
- If the report status was “validated”, “rejected”, or “rejected from above”: the report will appear as “conflicting”, the new and the previous versions will appear on the platform.
- If the report status was “conflicting”: its status will stay “conflicting” and the new version will replace the previous version that was not yet validated or rejected, only the newer version and the previously validated or rejected version will appear on the platform.

3.1.5 Data taken into account

Only data from validated healthcare facility reports is taken into account in the analyses. The rules to take data from a healthcare facility into account in the analyses are as follows:

- Pending report: data is not taken into account.
- Validated report: data is taken into account.
- Rejected report: data is not taken into account.
- Conflicting report: data from the previous validated version is taken into account until a new version is validated.
- Rejected from above: data is not taken into account.

3.1.6 Completeness and timeliness for data reporting and data validation

The indicators displayed on Argus web platform are computed using the following formulas:

- Completeness of data reporting: number of received reports / number of expected reports.
- Timeliness of data reporting: number of received reports on time / number of expected reports.
- Completeness of the data validation process: number of reports validated or rejected / number of reports received.
- Timeliness of the data validation process: number of reports validated or rejected on time / number of reports received on time.

3.2 Login and navigation

To access Argus web platform:

- Open a web browser.
- Go to the Argus web platform address: http://IP_ADDRESS/argus.
- Enter your username and password (Figure 18).
- Click on “Login”.

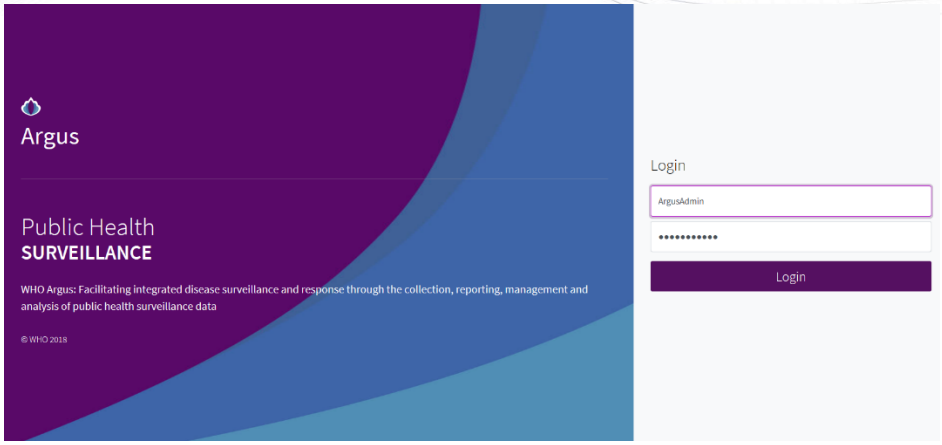


Figure 18. Argus web platform - Login page

The navigation bar on the left of Argus web platform permits to navigate to its four main pages (Figure 19):

- **Dashboard**: access an administrative and epidemiological dashboard providing a snapshot of the situation across the country.
- **Validation**: validate or reject the reports received.
- **Analyses**: download weekly epidemiological summaries and perform tailored analyses.
- **Archives:** browse all reports at all levels of the system.

Figure 19. Navigation bar of the Argus web platform.

3.3 Validation

Once connected to the Argus web platform, you will see all the reports needing to be validated or rejected. The interface shows a three-column layout (Figure 20):

- Left Column: navigation bar.
- Middle Column: list of reports to be validated or rejected.
- Right Column: details of the report to be validated or rejected.

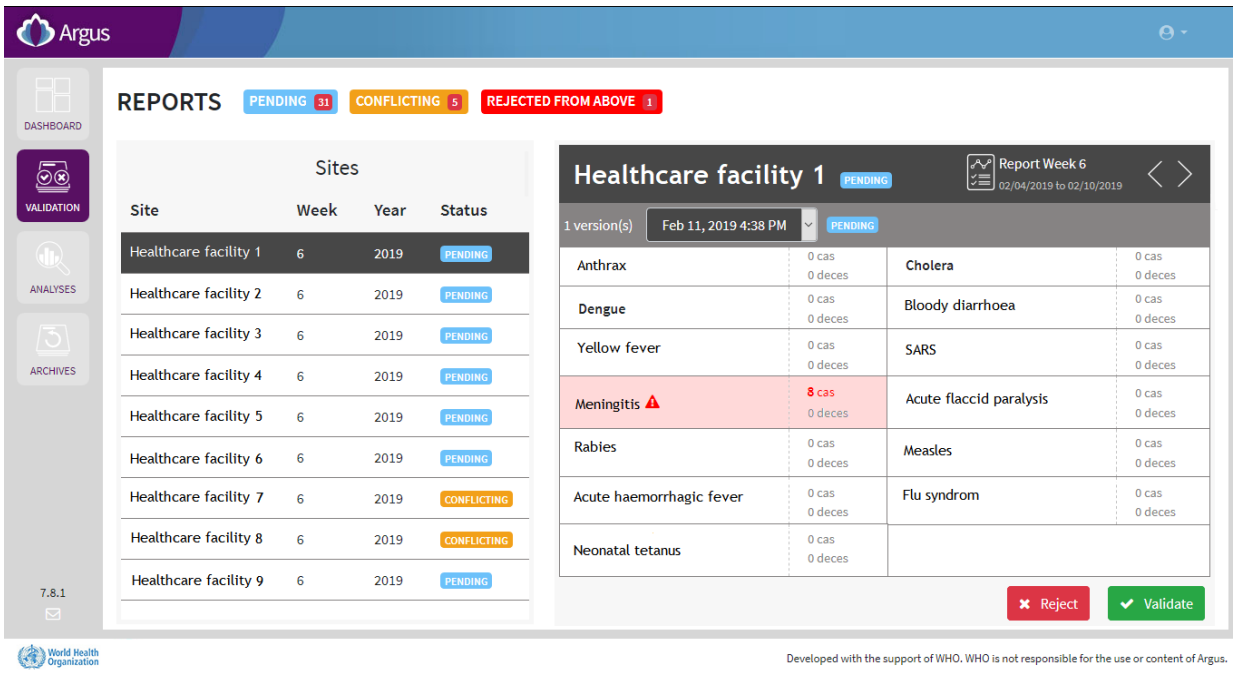


Figure 20. Argus web platform - validation page

Alert thresholds have been defined for diseases and conditions under weekly surveillance. If a threshold is reached, the disease is highlighted (Figure 19). You need to perform urgently an assessment of the situation.

To validate or reject a report, click on the “Validate” or “Reject” button. Once a report is validated or rejected, it will disappear from the validation page.

A report can only be validated once all the information has been received from the healthcare facility (i.e. all SMS have been received). Meanwhile, the report appears as “incomplete”.

If after two hours the report is still incomplete, reject the report and ask the healthcare facility to send the report again (using the red cross on Argus Android client as described in section 2.5).

For conflicting reports, you will see several versions of a report (Figure 21), only the last version of a report can be validated or rejected. When a new version is received, the modifications with the previous version are shown with bold arrows to indicate increasing or decreasing figures.

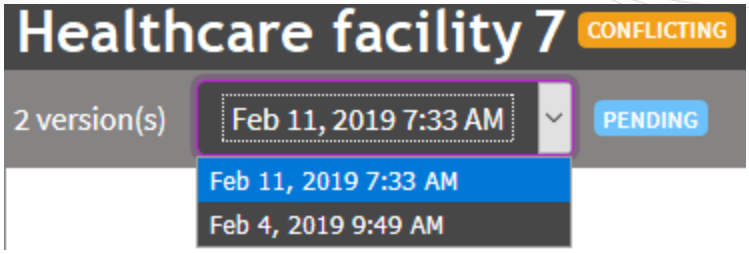


Figure 21. Several versions of a report.

As described in section 3.1.1, aggregated reports are created at the intermediate and central levels of the system. For aggregated reports, there is mention of the completeness of the aggregated report (i.e. how many validated reports from the peripheral level have been aggregated) (Figure 22).

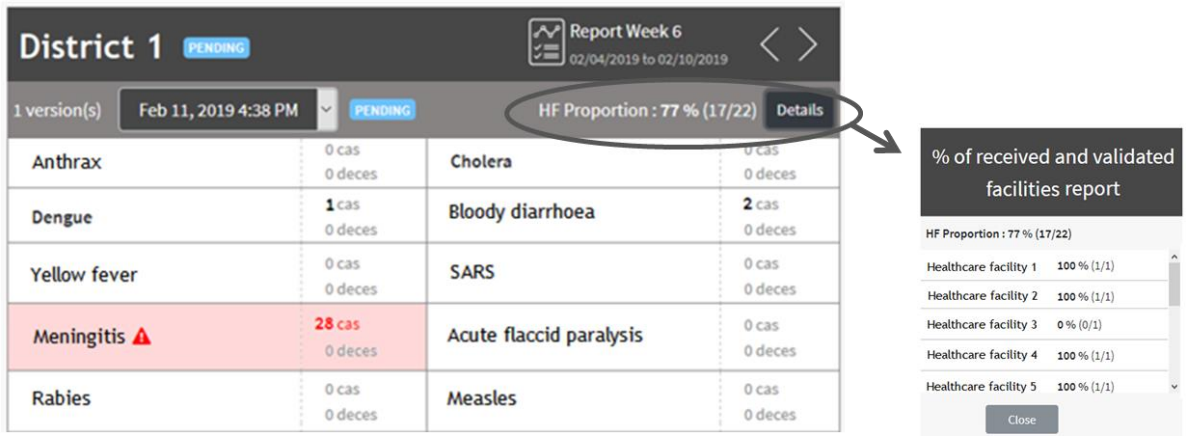


Figure 22. Aggregation details.

Once all reports have been validated or rejected, you will be asked to download the epidemiological situation summary for your area. Download it and check if there is an epidemiological threat requiring a rapid response (Figure 23).

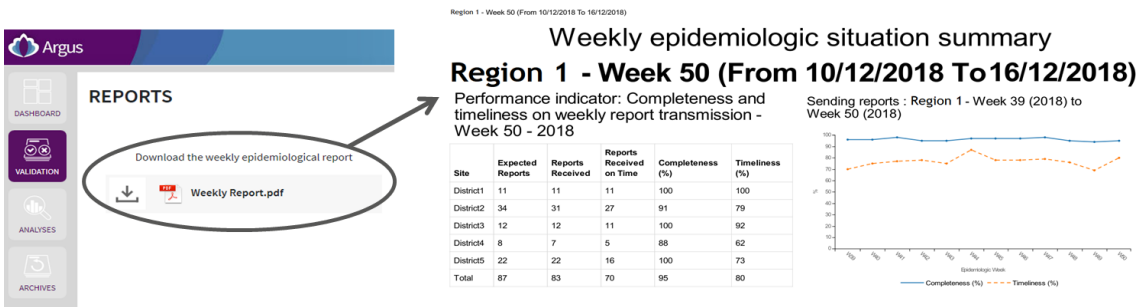


Figure 23. Download the weekly epidemiological summary.

3.4 Analyses

Only data from validated healthcare facility reports is taken into account in the analyses (see section 3.1.5).

From the analyses page, you can download weekly epidemiological summaries for a specific site and week, and perform tailored analyses for a specific site and period.

Each user has specific rights on the Argus web platform, check with your administrator what you are allowed to do in the platform.

3.4.1 Select the site and period of interest

To select the site and period of interest (Figure 24):

- Click on “Show filters” on the top right corner of the page.
- A selection panel appears:
  - Click in the box below “Period” to choose the period of interest.
  - Click on the box below “Site” to choose the site of interest, one box will appear for each level of the system.
  - Click on the “Apply” button.

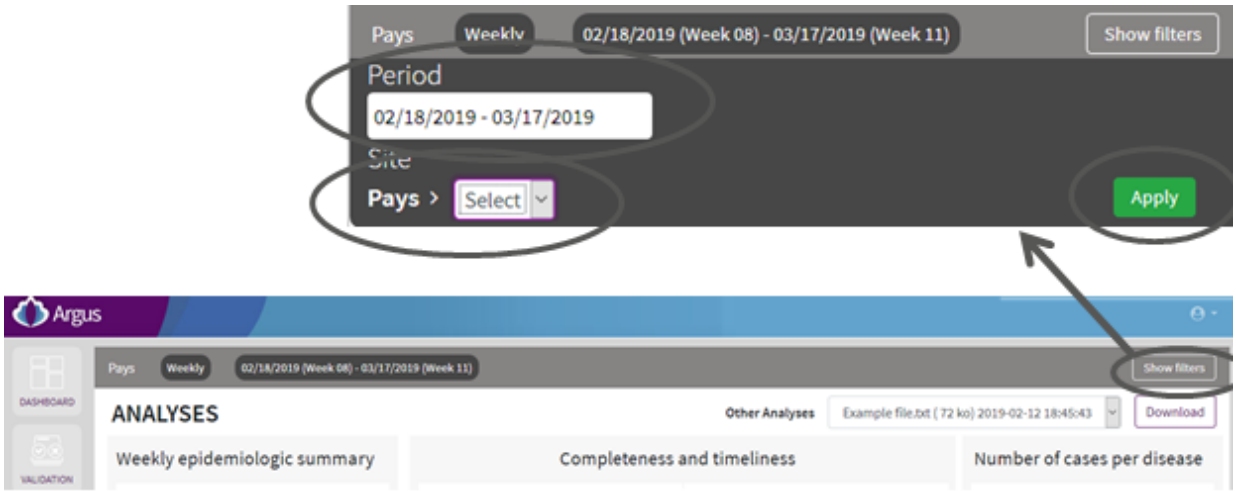


Figure 24. Selection of the site and period of interest

3.4.2 Weekly epidemiological summary

To download a specific weekly epidemiological summary (Figure 25):

- Select the site of interest as described in section 3.4.1.
- Select the year and week of interest as shown in Figure 24.
- Click on the download button.

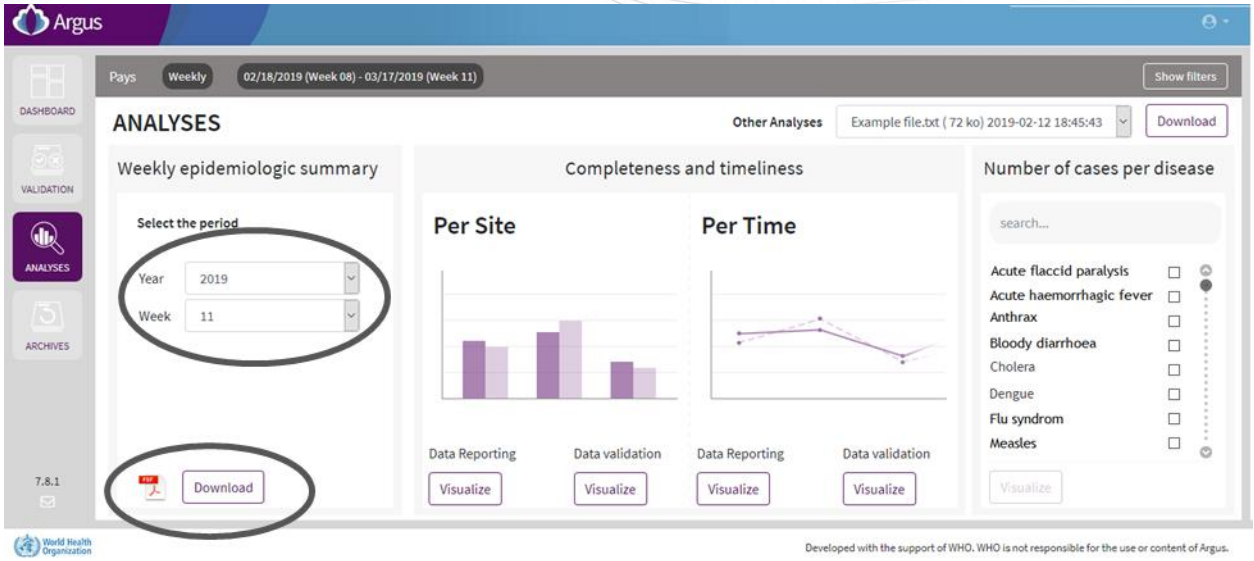


Figure 25. Download a specific weekly epidemiological summary.

3.4.3 Tailored analyses

You can create tailored graphics and tables for the following indicators: completeness and timeliness of data reporting and data validation, and evolution of the number of cases of a disease or condition (Figure 26). To do so:

- Select the site and period of interest as described in section 3.4.1.
- Select the type analysis to be performed (Figure 26).
- A page will appear with the results of the analysis (Figure 27), it is composed of a graph and a table. You can export the results of the analysis clicking on the "Export" button.

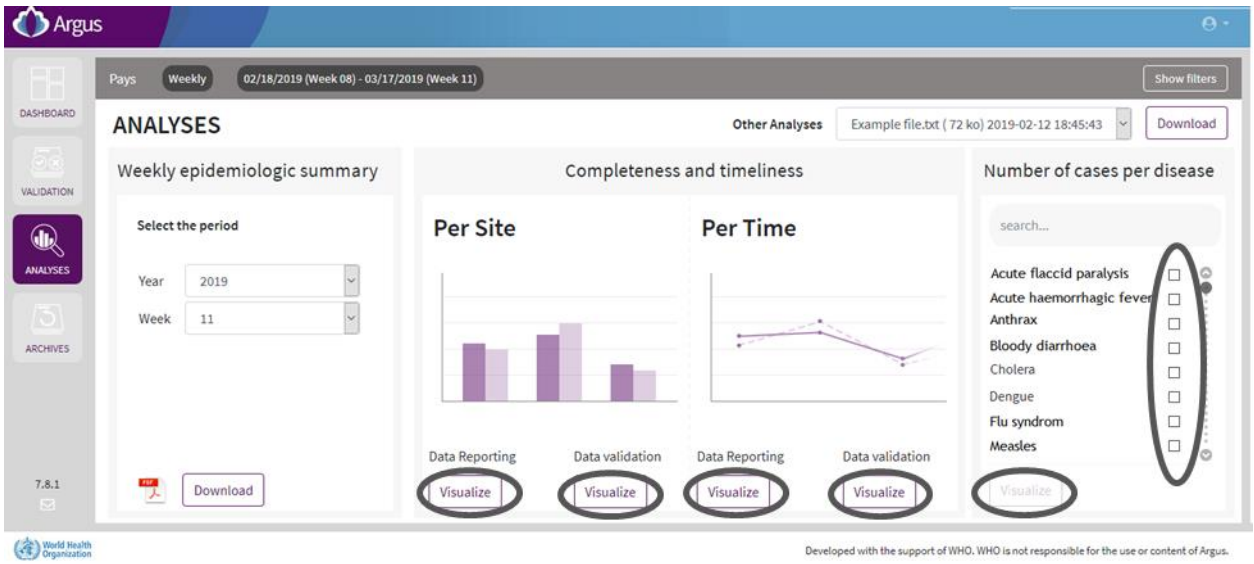
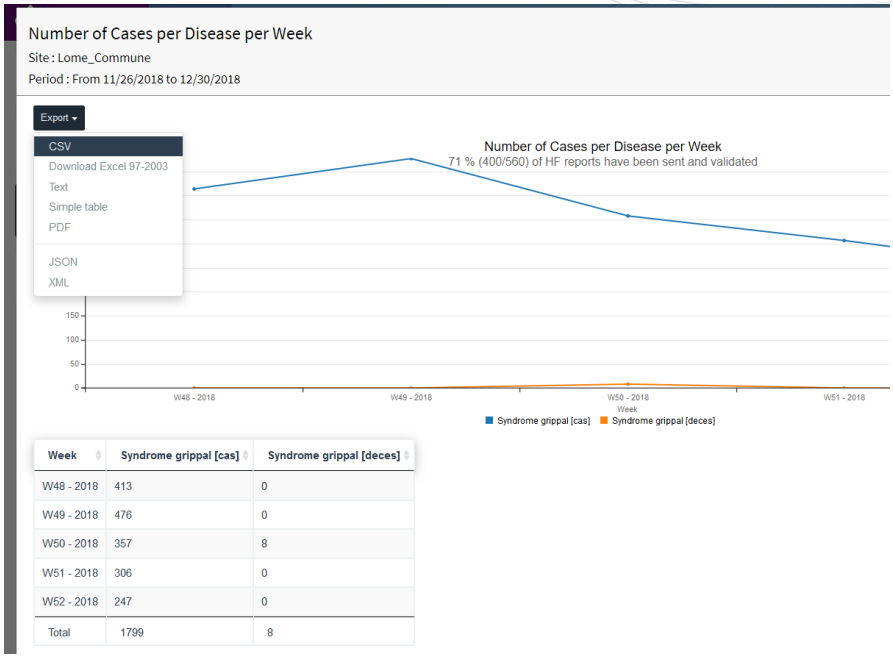


Figure 26. Perform tailored analyses.



Week	Syndrome grippal [cas]	Syndrome grippal [deces]
W48 - 2018	413	0
W49 - 2018	476	0
W50 - 2018	357	8
W51 - 2018	306	0
W52 - 2018	247	0
Total	1799	8

Figure 27. Tailored analysis page.

3.5 Dashboard

The dashboard page displays two dashboards updated every 15 minutes (Figure 28):

- One administrative dashboard for the whole country providing information on:
  - Evolution of completeness and timeliness of weekly reporting during the 12 previous weeks.
  - Overall completeness and timeliness of weekly reporting during the 12 previous weeks for each intermediate and central level.
  - Overall completeness and timeliness of data review during the 12 previous weeks for each intermediate and central level.
  - List of reporting sites with no reports received for more than 3 and 8 weeks.
- One epidemiological dashboard for the whole country providing information on:
  - Evolution of the number of cases during the 12 previous weeks for diseases and conditions having reached the alert threshold.
  - Map of the number of cases during the 2 previous weeks for diseases and conditions having reached the alert threshold.
  - Details of reports with values above alert thresholds during the 2 previous weeks.
  - List of alerts received during the 10 previous days.
  - Table of the cumulative number of cases and deaths for each disease since the beginning of the year, and the previous year for the same period.

Figure 28. Excerpts of the administrative and epidemiological dashboards.

To view each dashboard, click on the appropriate button (Figure 29).

Figure 29. Select the dashboard to be displayed.

3.6 Archives

The archive page permits to see the details of any report available in the Argus system. Reports appear in a similar way that in the validation page (see section 3.3).

To see a specific report, select the site and week of interest as described in section 3.4.1.

3.7 Common issues and solutions

- **Impossible to connect to the platform**: check your internet access, check your username and password, check that your keyboard is not locked in capital letters.
- **A report is incomplete and can't be validated**: wait for the report to be fully received (up to 2 hours); call the healthcare facility to send back the report by pressing the red cross in the history page of the Argus mobile phone.
- **Impossible to perform an action**: each user has a different set of permission, check with the administrator your permission.
- **A report was received but its data is not taken into account in the analyses**: data from a report is only taken into consideration in the analyses once the report has been validated.
- **Other issue**: contact your technical support.