

BioSense Platform User Manual for the DATA QUALITY DASHBOARD



Technical Assistance: support.syndromicsurveillance.org

The National Syndromic Surveillance Program (NSSP) promotes the use of automated, electronic health data. NSSP provides a secure and integrated electronic health information system that hosts standardized analytic tools and facilitates collaborative processes. The NSSP is a product of the Centers for Disease Prevention and Control.

BioSense Platform User Manual for the Data Quality Dashboard

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Revision History

Date	Revisions
October 2023	In Data Quality Dashboard Version 2.0, we have completely overhauled the application and created a new User Interface. This overhaul was required because version 2.x uses Grid Cards (Java GridLayout Class), to provide an improved User Interface.
May 2021	Revised to reflect more descriptive labeling on User Interface: <ul style="list-style-type: none">▪ Section 5 (Completeness) and▪ Section 6 (Validity) Other miscellaneous revisions to make instructions clearer.
February 2020	Revised: <ul style="list-style-type: none">▪ Section 8—Plot Builder Reference Guide—Pages 29–34▪ More fully described Feeds and Filters on pages 1, 2▪ Cleaned up hyperlinks and made numerous stylistic changes.
October 2019	Initial release of documentation

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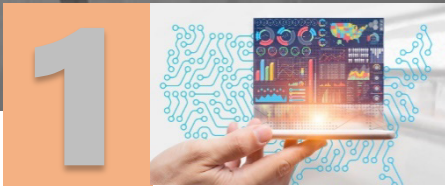
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Introduction

The National Syndromic Surveillance Program (NSSP) groups facilities under organizational authorities called sites. A *site* is a public health department (local, county, or state) or other organization that serves as the administrative hub for any facilities with which it has made agreements to provide data from those facilities to the BioSense Platform. Each site is responsible for one or more data feeds that transmit data to the BioSense Platform, and each feed can contain data from one or more facilities.

The NSSP BioSense Platform receives electronic health data and has the capability to integrate with other sources via data feeds (for example, lab or mortality data). NSSP processes these data and provides access to sites for analysis.

Initially, feed names are created and added to the Master Facility Table (MFT) by the BioSense Platform onboarding team, coordinating with each organization's site administrator. When the onboarding process is complete, the site is set to an *active* state.

Feeds can be associated directly with one facility or may act as a central feed for several facilities.

The Data Quality (DQ) Dashboard is an interactive tool that was developed by the NSSP to help site administrators identify potential data processing issues. The DQ Dashboard helps to ensure data are useful by measuring the timeliness, completeness, and validity of data that is processed on the BioSense Platform.

When the dashboard is displayed for a site, all feeds associated with that site in the MFT are displayed by default. The dashboard is populated from underlying tables that contain metrics (data flow, completeness, validity, and timeliness) by primary facility by day (either `arrived_date` or `C_Visit_Date`).



Prerequisites

The DQ Dashboard is best viewed with Microsoft Edge or the Google Chrome browser. Other browsers (e.g., Internet Explorer or Safari) may not display all data, graphics, and reports as intended.

For optimal viewing experience, your display resolution should be set to 1920 x 1080.

Use this URL: <https://dashboards.syndromicsurveillance.org/app/dqdb> for direct access.

NSSP BioSense Platform Site Administrator Account. Site administrators have access to the DQ Dashboard. If site administrators want to grant access to other users within their sites, they should submit a ticket to the NSSP Service Desk

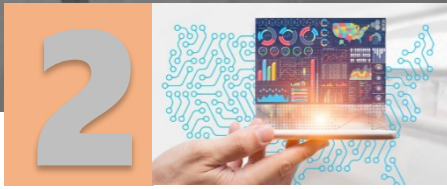
<http://support.syndromicsurveillance.org> with information on who should be granted access. Please include the user's Access & Management Center (AMC) username and email address.

Authorized users can also access the DQ Dashboard via a link on the AMC Home tab: NSSP Applications > NSSP Dashboards & Visualizations. (Log in with your Production UserID.)

QUICK
TIPS



Please note that sections 2 through 7 are laid out in the order they appear in the Navigation Bar located on the left in the application. This is for easy reference.



Overview

The overhauled DQ Dashboard provides an updated user interface with enhanced graphics and navigation using a functionality known as grid cards. In this manual, we will refer to the various sections on each page as *cards* or *grid cards*.

Several new features are introduced, and instructions for their use are presented here.

Note that data processing metrics, namely, data flow, completeness, validity, and timeliness, are assessed at the *primary facility* level. Data sent from associated facilities are rolled up to their primary facility’s C_BioSenseFacility_ID as registered in the site’s MFT. When data are subset via filters to a primary facility, data from its associated facilities are included.

The DQ Dashboard (Figure 1) has three main sections. They are:

- The Navigation Menu on the left sidebar,
- The current page’s content in the middle and,
- On the right sidebar, a graphic representation showing the data selected as a percent of total data available, the **Filters** button to access the filter selection page, and a summary of data filters enabled.

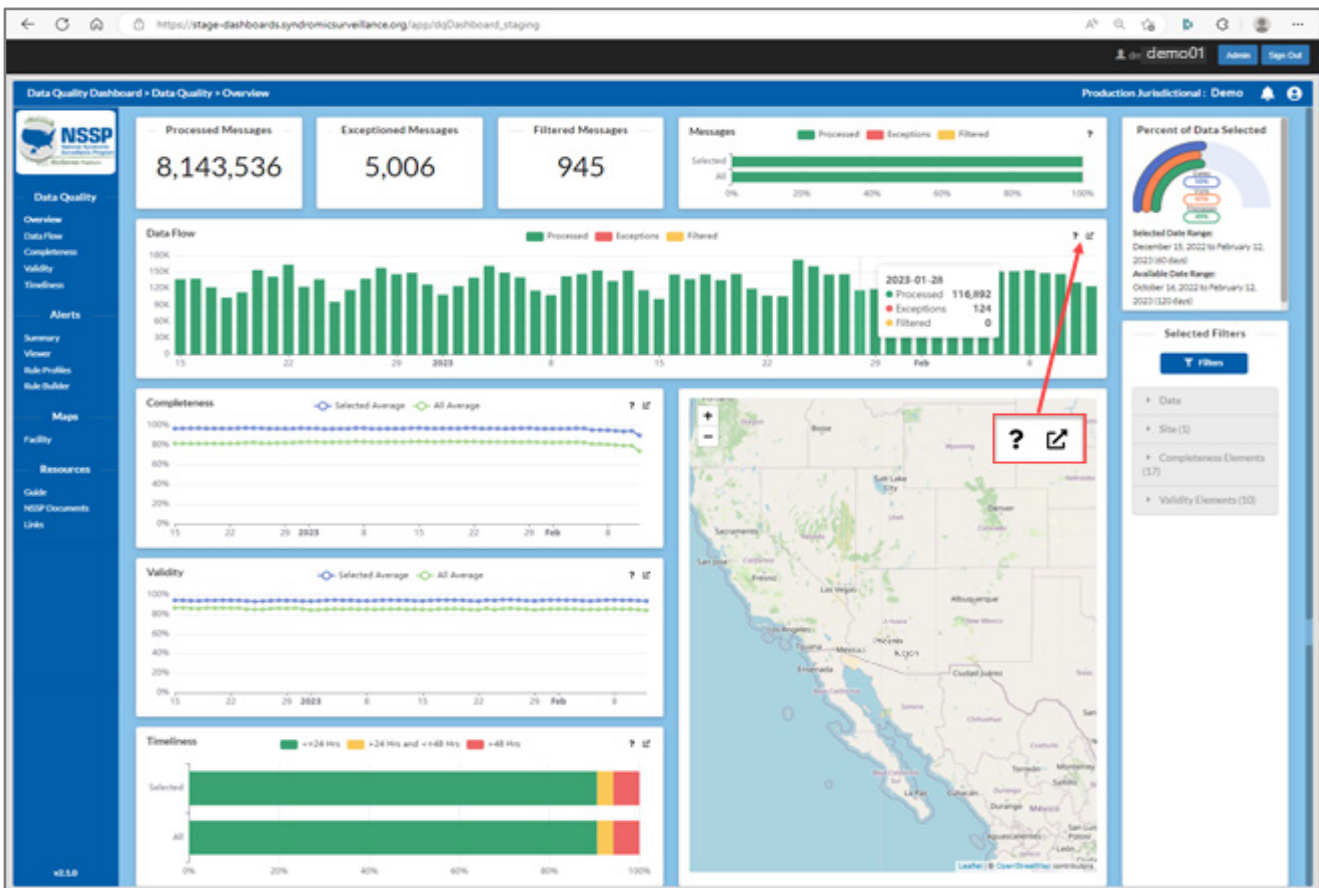



Figure 1. Overview Page

At the top of the application page is a black bar that displays your user ID and **Admin** and **Sign Out** buttons.


The **Admin** button displays technical information of value to the NSSP technical support team. If you click the **Admin** button, you can use the browser's back button to return to the dashboard.

Click the **Sign Out** button to log out of the dashboard application and return to the dashboard login screen.

Below the black bar, there is a blue bar (called the *Top Menu*) that shows the webpage navigation path on the left, for example, *Data Quality Dashboard > Alerts > Summary*, and, on the right, the dashboard type and site, e.g., *Production Jurisdictional: [site short name]*.

On the Top Menu at the far right, you will see a set of two icons: 

- The first is an icon for alerts (a bell). A red dot on the bell indicates that alert information is available. Hovering the cursor over the bell will display a summary of Data Quality Alerts for the past week. If you click on the bell, the Alert Summary is displayed (Top Menu Navigation path shows *Data Quality Dashboard > Alerts > Summary*).
- The second icon (a person) links to your user profile. You may switch between Production and Onboarding environments or, with elevated privileges, select a different site.

Note: When you click on the first icon (the bell), the *Data Quality Dashboard > Alerts > Summary* page is displayed, listing the alerts received. In addition, the two icons are replaced by three icons: 

- This third icon (in the center) is a gear and represents a link to the Alerts Settings page where your Alert Rules Summary can be viewed. Also on this page is the Custom Alerts tab. This tab provides an interactive form for creating new Alert Rules.

2.1 Overview Data Display Section

The Overview Page (Figure 1) gives a snapshot of the overall health of your data. Grid cards shown at the top are counts of processed, exceptioned, and filtered messages. To the right of those counts, each type is displayed in a stacked horizontal bar chart showing Selected (via filters) versus All messages for these counts.

Descriptions of messages by count:

- **Processed Messages**—This is the total number of messages that were processed during the selected date range. See the Percent of Data Selected grid card on the far right for the Selected Data Range, or click on the **Date** filter below the **Filters** button on the right.
- **Exceptioned Messages**—These messages did not meet the processing threshold and are excluded from the data in ESSENCE. Typical reasons for a message to be exceptioned are:
 - Facility ID unknown or not active at time of message processing,
 - Visit_Date_Time is in the future,
 - Message does not have a valid patient identifier.
- **Filtered Messages**—These messages are those that do not meet basic HL7 requirements. For example, corrupted HL7 message structure or in a format other than HL7.
- **Messages Bar Graph**—This bar graph compares the percent of Selected messages to the percent of All messages that were Processed, Exceptioned, and Filtered.

► **Filters and Exceptioned Messages**

Depending on the specific exception reasons, the exceptioned messages could be missing facility information or contain facility information not registered in the MFT. Therefore, use of facility-related filters such as Facility Name, Parent Organization, Vendor, or Facility Type will only include exceptioned message data for which that level of information is available.

► **Filters and Filtered Messages**

Filtered messages only include information about your site’s feeds. There is no information that relates to the facility or its characteristics. Therefore, only the feed filter applies to filtered messages.

As can be seen in Figure 1, below the message count grid cards, the Overview Data Display Section for Data Flow is presented in a stacked bar chart indicating each type of message by day. Below this bar chart, there are three graphs indicating data quality in terms of Completeness, Validity, and Timeliness. To the right of those, there is a regional map with indicators (not shown) for primary facilities included in these data.

The three graphs display counts by day for Completeness, Validity, and Timeliness in separate charts. Completeness and Validity charts graph both All and Selected messages. The Timeliness graph (stacked bar type) compares timeliness of *selected* visits versus the timeliness of *all* visits.

Note that hovering over a graph element, such as a bar or line on any graph, will provide detailed information about that element as seen in Figure 2.

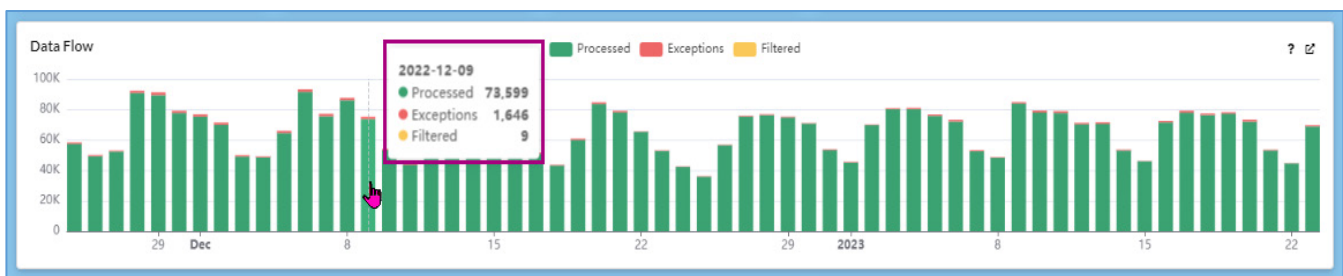





Figure 2. Hovering over an element pops up information about that element.

You will note in the upper-right corner of Data Flow grid card in Figures 1 and 2, and in most of the other graph grid cards, one or more of these icons:  

When you hover over the question mark  icon on a graph in the Data Quality section, a popup explanation or helper text will be displayed describing the graph as in Figure 3.

In the Alerts section, hovering over the question mark will display an instruction, “Click here to learn more about ...”. Clicking on the question mark will pop up a Helper Text panel with more detailed information (see [Alerts](#) section to learn about Helper Text popups).

Moving the cursor away from the question mark icon will remove the popup.

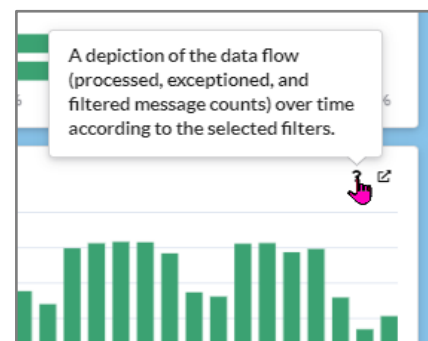



Figure 3. Data Flow Pop-up

2.2 Expanded Graph and Table Pane

Click on the  icon to display an expanded version of the graph with a table of values below it (Figure 4).

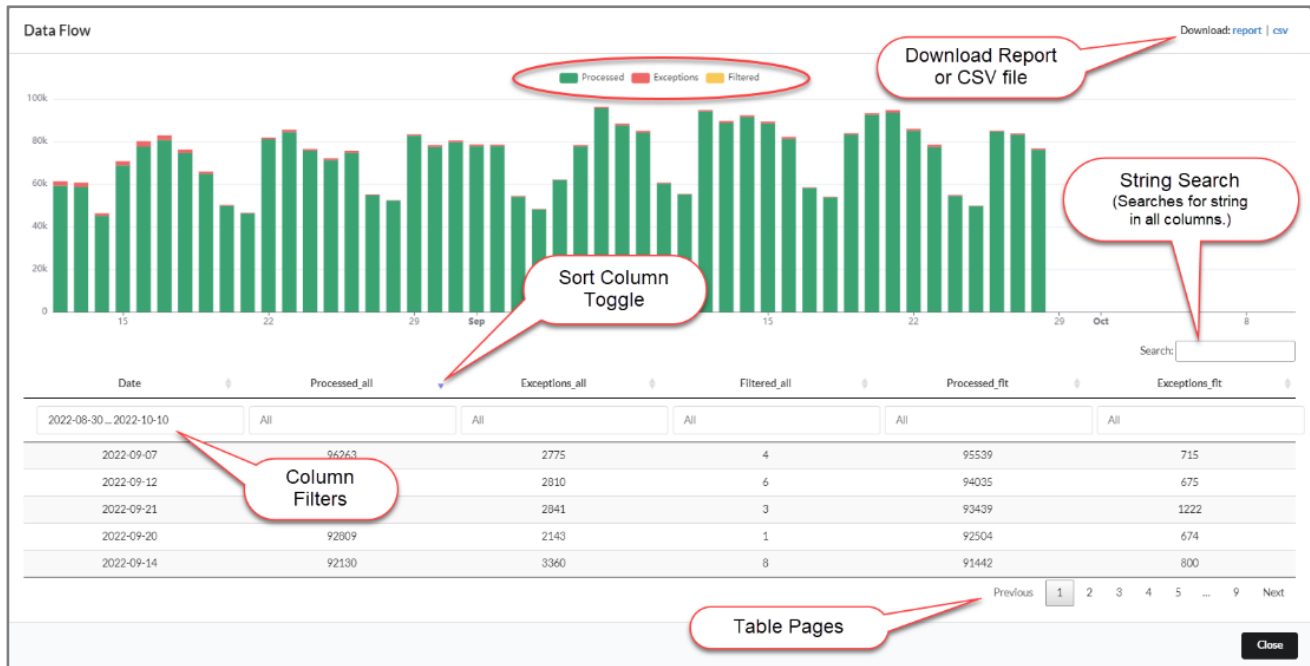


Figure 4. Pop-up Data Flow Graph and Table Pane

Interactive Color Keys

QUICK TIPS 

Note the color keys at the top of various visualizations (graphs). As an example, the keys are circled at top of Figure 4. A new feature—interactive color keys—is introduced with Version 2 to help you interpret graphs.

By clicking on a key, those data are removed from the graph. Clicking a second time adds these data back.

This is particularly useful when one type of data makes up most of the graph and overshadows other types. Figure 5 on the next page demonstrates this feature.

Figure 5 compares the full Data Flow graph with all messages included versus the same graph with the Processed Messages suppressed. You can see in the upper graph that Processed Message counts overwhelm the counts for Exceptioned and Filtered Messages. By suppressing the Processed Message in the lower graph, a better view of Exceptioned and Filtered Messages can be rendered.

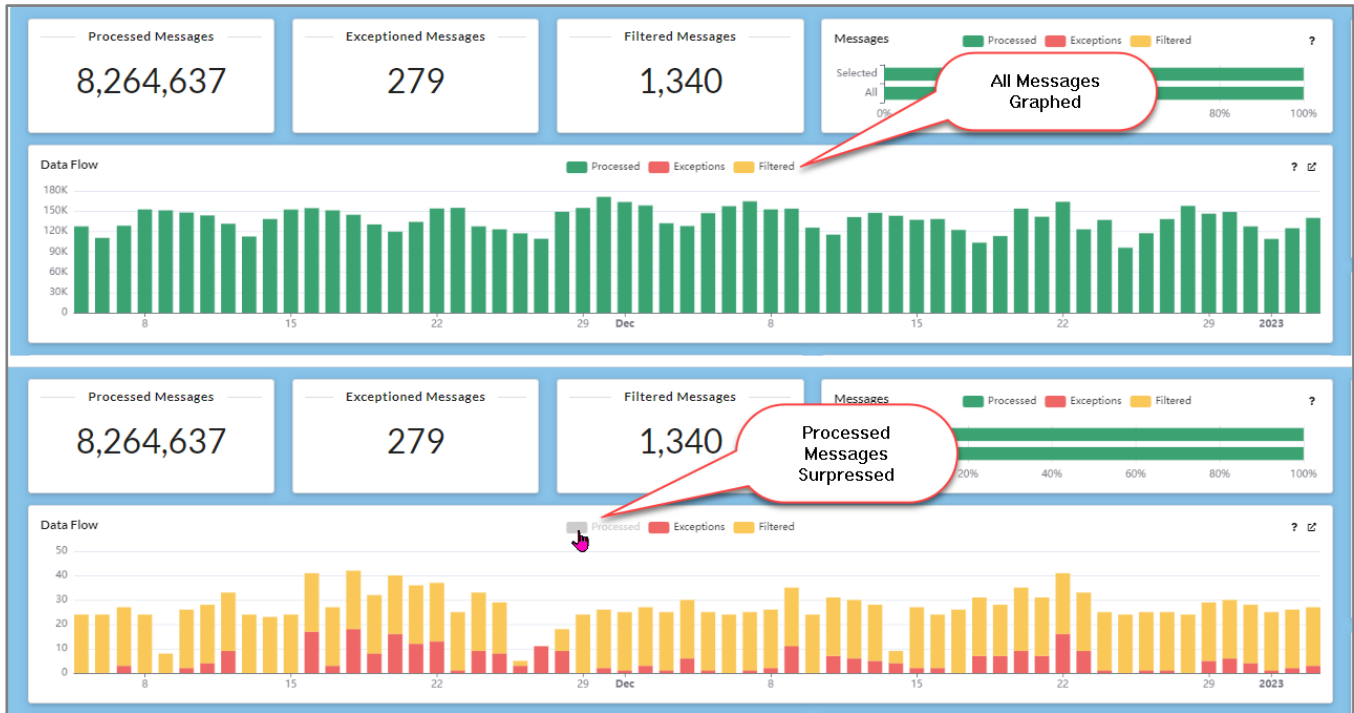


Figure 5. Comparing Data Flow Graphs for the Same Dataset With and Without Processed Messages

Try this on other graphs to see if this feature can assist you in locating issues within your data.

You will note that the data table columns vary with the type of visual. Table 1 indicates the columns displayed in each graph type when called from the Overview page:

Table 1. Specific Columns for Each Graph Type When Selected from the Overview Page						
Visualization	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Data Flow	Date	Processed_All	Execptions_all	Filtered_all	Processed_ft	Exceptions_ft
Completeness	Date	Avg. Completeness_all	Avg. Total_all	Avg. Completeness_ft	Avg. Total_ft	
Validity	Date	Avg_VValidity_all	Avg_Total_all	Avg_VValidity_ft	Avg_Total_ft	
Timeliness	Category	<=24 Hrs.	>24 Hrs. and <=48 Hrs.	>48 Hrs.	Total	

Each column can be individually filtered. When you click in a column filter field, as noted in Figure 3, two sliders are displayed with the minimum and maximum value available (Figure 6). Just move the sliders to adjust the minimum and maximum values you want, then move the cursor away and click anywhere outside the field and slider. When you click, the filter is dynamically applied.

As an alternative, you may enter values directly in the filter field separated by an ellipsis (...). For example, you could enter 1000...10000. Or you could only enter one value with an ellipsis. If the ellipsis comes after a value, it will be taken as the minimum value and any row in the table with that value or greater will be displayed. Otherwise, if you place the ellipsis before a value, it will be considered the maximum and all rows with that value or less will be displayed.

More than one column may be filtered. Multiple column filters act as ANDs when rows are displayed.

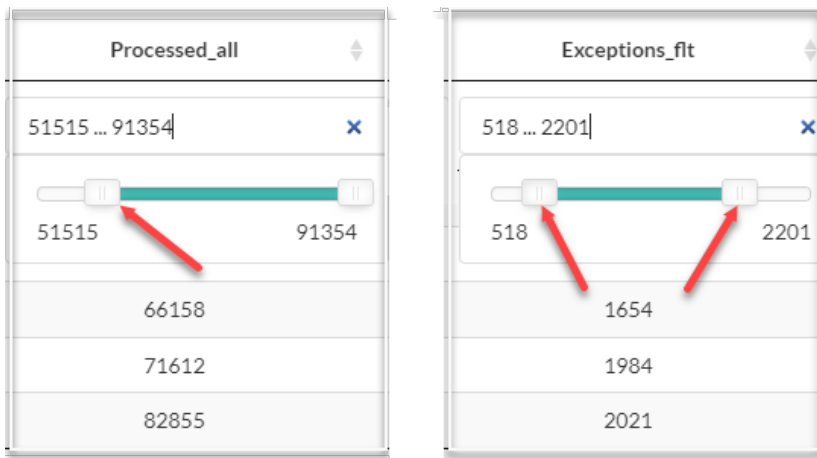


Figure 6. Column Filters use Sliders to set Lower and Upper bounds, or you may enter values directly.

At the bottom of the displayed table rows, you will see the table pagination buttons (Figure 7). All data on the graph are present in the table, and the table is paginated to fit the display space with five rows per page. You may select a specific page or click the **Previous** or **Next** buttons to step back and forth through the table.

The **Close** button closes the expanded graph and table pane and returns you to the previous view.

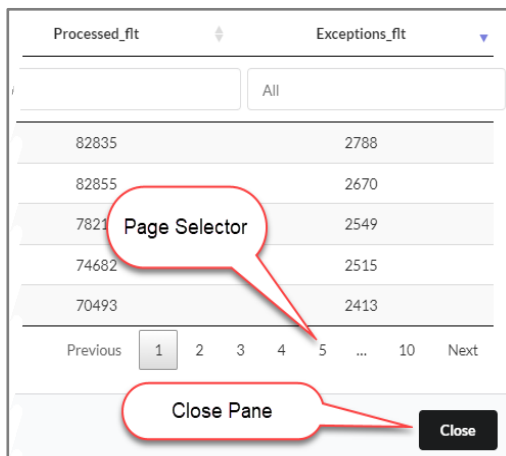


Figure 7. Page Selector and Close Pane Button

2.3 Download Report or CSV File

The Download: **report** and **csv** buttons are shown in the upper right on each of the expanded graph and table panes and illustrated here: Download: [report](#) | [csv](#)

The **report** and **csv** buttons can be used to copy the graph and table data. Specifically, the **Download: report** button generates an interactive webpage (html) that displays the graph and the table of values similar to the detailed view within the dashboard (Figure 8), except for column filters that are not available (see description of column filters below). This type of report can be shared with others or archived locally.

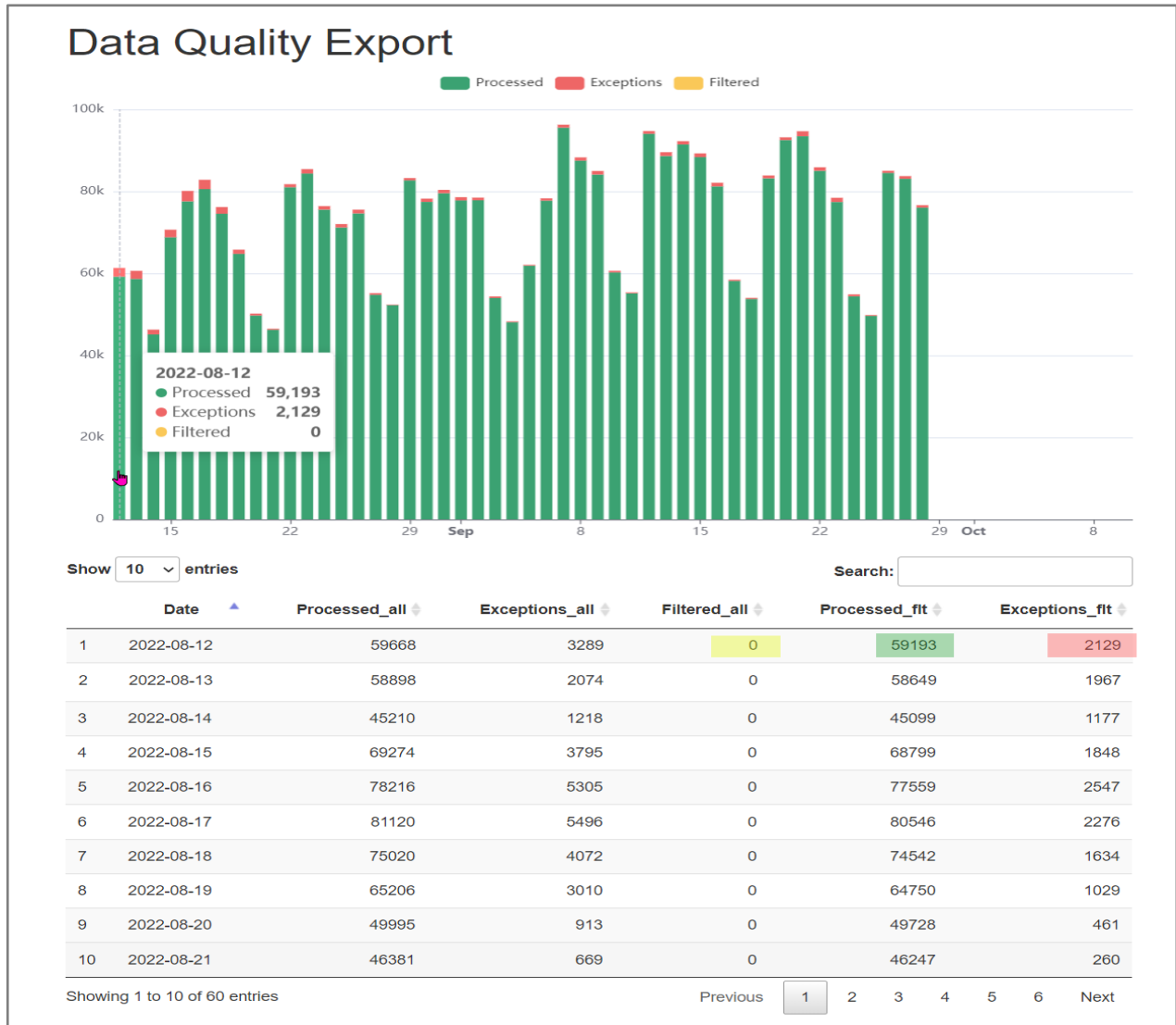



Figure 8. Interactive Graph and Table Webpage Generated by the Download: Report Button (Note that the Column values are highlighted on first table row to illustrate matching graphed quantities.)

The **Download: csv** button downloads a comma separated values (csv) file that may be saved for future analysis and viewed with a text editor or a spreadsheet application such as Excel.

2.4 Stratify (Group) by and Facet by Controls

When you view the Completeness, Validity, and Timelessness grid cards that are launched from the Navigation Menu, you will note a third  icon located in the upper right of some grid cards.

This third icon only appears on the:

- Completeness by Visit Over Time and Completeness by Visit grid cards,
- Validity by Visit Over Time and Validity by Visit grid cards, and
- Average Time Delayed and Timeliness by Visit grid cards.

These can be seen on these expanded graph and table panes, and on the visualizations noted in the bullets.

This is the **Settings** button. Here you can change stratification (Group By) and faceting of your data. Table 2 lists the variables that can be selected for stratification. The default values are in **bold**:

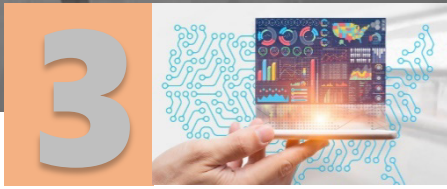
Table 2. Stratify or Group by Selections						
Grid Card	Stratify or Group By					
Completeness Over Time	Element	Feed_Name	Facility_Name	Parent_Organization	Vendor_Name	Facility_Type
Completeness	Element	Feed_Name	Facility_Name	Parent_Organization	Vendor_Name	Facility_Type
Validity Over Time	Element	Feed_Name	Facility_Name	Parent_Organization	Vendor_Name	Facility_Type
Validity	Element	Feed_Name	Facility_Name	Parent_Organization	Vendor_Name	Facility_Type
Average Hours Delayed		Feed_Name	Facility_Name	Parent_Organization	Vendor_Name	Facility_Type
Timeliness		Feed_Name	Facility_Name	Parent_Organization	Vendor_Name	Facility_Type

Table 3 lists the variables that can be selected for faceting. The default values are in bold:

Table 3. Facet by Selections							
Grid Card	Facet By						
Completeness Over Time							
Completeness	None	Element	Feed_Name	Facility_Name	Parent_Organization	Vendor_Name	Facility_Type
Validity Over Time							
Validity	None	Element	Feed_Name	Facility_Name	Parent_Organization	Vendor_Name	Facility_Type
Average Hours Delayed							
Timeliness							

QUICK TIPS

Stratification and *faceting* are different visualization methods for grouped data. Either may depict grouped data, and both approaches allow data to be grouped twice (i.e., using two different variables). Although users may stratify and facet by using the same variable, **this is strongly discouraged** because it is duplicative and could make the visualization difficult to interpret.



Navigation Menu

Section 3 presents a high-level description of the Navigation Menu. See sections 4 through 8 for more detail.

There is a vertical Navigation Menu or Bar on the left that allows the user to jump to the various panes provided by the dashboard. For easy navigation, the page links are ordered by sections. The sections are Data Quality, Alerts, Maps, and Resources.

3.1 Data Quality Section

The Data Quality section allows you to return to the Overview page or to go directly to Data Flow, Completeness, Validity, or Timeliness panes.



3.2 Alerts Section

In the Alerts section, you can display alert Summary information and view details and comment on individual alerts using the alert Viewer.

In addition, you can access the Rule Profiles, and Rule Builder pages. Your rules are listed on the Rule Profiles page. There is a link to the Rule Builder, where you can preview, modify, and create rules.

3.3 Maps Section

The Maps section displays facilities associated with your site.

Facilities may be displayed as single, stand-alone facilities, indicated by a Facility Pin: , or as a group, indicated by the Facility Group icon: . The small number in the center of a Facility Group icon indicates the number of “nodes” that groups contain. Nodes, in this context, may represent individual facilities, smaller facility groups, or a combination of stand-alone facilities and smaller facility groups. Also of note is that the Facility Group icons are color coded to indicate the approximate number of nodes in the group (see [Facility Status Indicators](#) for details).

3.4 Resources Section

Below the Maps section are resource links to this user manual (Guide), the NSSP Technical Resource Center (NSSP documents) website, and miscellaneous other links (Links).

On the far right, is a grid card with a graph entitled Percent of Data Selected. This is based on the default filters or the filters currently selected. In addition to a graph, the date range of data currently selected and date range of all data available for review are provided in text form.

Below the Percent of Data Selected card is the Selected Filter grid card with a **Filter** button for switching to the filter selection screen and a list of the filter types already in place. Note that these filter type buttons can be expanded to show the specific filters enabled.

Figure 9 illustrates the Navigation Menu on the left and the Percent of Data Selected and Selected Filters display on the right. The Data Quality Alerts bell sits above the Percent of Data Selected graph on the top menu bar, and the red dot on the bell (if displayed) indicates that alerts are available to view:

- Hover over the **bell** for a summary.
- Click on the **bell** to display the Alerts > Summary page (displays as Alerts > Summary in the Top Menu's navigation header).

The Navigation Bar has four menu sections: Data Quality, Alerts, Maps, and Resources. At the bottom of this bar, the installed version number is displayed. More detailed information for Data Flow, Completeness, Validity, and Timeliness may be viewed by navigating to specific subsections of the Data Quality section. Additional sections provide links to Alerts and Rules management, Maps, and Resources.

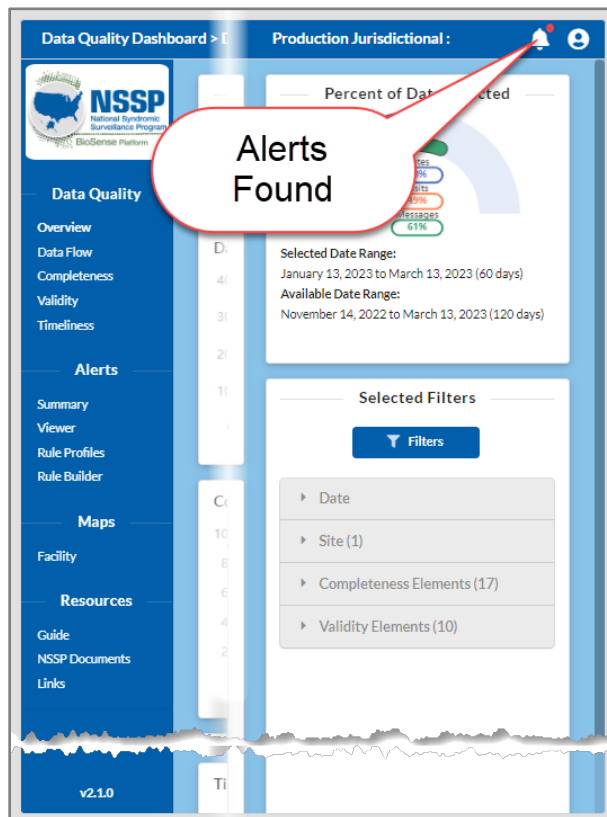
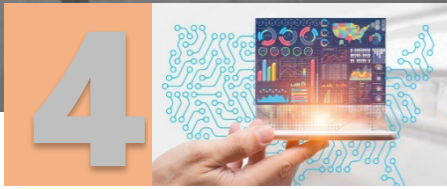


Figure 9. Navigation Bar (Left) Shown with Data Selected and Filters (Right)



Data Quality Section

The Data Quality section (Data Quality Dashboard > Data Quality >) provides links to the Overview, Data Flow, Completeness, Validity, and Timeliness pages.

4.1 Overview

Returns to the Overview or Home page as described in [Section 2.1](#).

4.1.1 Summary Counts

Three smaller grid cards are displayed across the top of the Overview pane. These are the same cards that appear on the Data Flow pane, and they show the counts of Processed Messages, Exceptioned Messages, and Filtered Messages.

Also at the top is a horizontal stacked bar graph depicting the same summary count metrics in graphical form.

4.1.1.1 Processed Messages

The first grid card displays *the* total Processed Message count. These messages passed both Exceptioned and Filtered message tests and were sent to the “Processed” table.

4.1.1.2 Exceptioned Messages

The second grid card shows the count of Exceptioned Messages. The three reasons that can trigger an Exceptioned Message are:

- C_Facility_ID was not an active facility at the time of message processing.
- C_Visit_Date_Time is set in the future.
- Message did not include a valid C_Unique_Patient_ID.

4.1.1.3 Filtered Messages

When messages are filtered, the third grid card will display the count. Possible reasons for messages to be filtered are:

- No facility information for HL7.
- No Date/Time for HL7.

4.1.1.4 Messages Graph

To the right of the three grid cards for Processed, Exceptioned, and Filtered Messages, there is a horizontal stacked graph depicting the three message counts described above as percentages of the selected (filtered) messages and total messages received. Hovering over this graph will show calculated percentages.

The colored keys above the graph are interactive. Click on a color to toggle off that count in the graph. Click the same color again to toggle its count back on.

Toggle Off Processed Messages on Message Graph to Better View Exceptioned and Filtered Messages

Since Processed Messages make up most messages, it can be helpful to toggle these off and look for patterns in the Exceptioned and Filtered messages. **Keep this tip in mind for other graphic visualizations, too.**

4.1.2 Data Flow by Message

The Data Flow by Message graph is directly under the Summary Counts described in Section 4.1.1 This stacked graph visualizes the daily message flow and stacks the Processed, Exceptioned, and Filtered Message counts by day.

The colored keys above the graph are interactive (see the Quick Tip above). Click a **color**, to toggle off that count and remove it from the graph. Click the same **color** again to toggle its count back on and add to the graph.

4.1.3 Completeness by Visit

This line graph provides a comparison of average completeness over time for all elements in the data and completeness over time for elements selected by filters in a 60-day range ending the last day of data processing. This chart can be enlarged into a bar graph with a table containing counts for all data elements and filtered data elements.

4.1.4 Validity by Visit

This graph provides a view of Validity data similar to the Completeness by Visit line graph. Compare and analyze all your data's average validity versus selected data's average validity for the 60-day period ending with the last day that data were processed for validity analysis. This chart can be expanded to an enlarged graph with a data table with counts for all data elements and selected data elements.

4.1.5 Timeliness by Visit

The Timeliness by Visit graph displays two horizontal stacked bar graphs. The top bar graph visualizes the proportions of timeliness (in percentages) for selected visits and the bottom one shows proportions of timeliness for all visits. This provides a measure of time delay from the date and time of a visit until the first message is received by the BioSense Platform. Timeliness is categorized by:

- Less than or equal to 24 hours (≤ 24 Hrs),
- Greater than 24 hours and less than or equal 48 hours (> 24 Hrs and ≤ 48 Hrs), and
- Greater than 48 hours (> 48 Hrs).

4.1.6 Map of Site Area

A map displaying the geographic location of the site is displayed. This map includes Facility Pins and Facility Group icons (depending on zoom resolution) to provide an overview of locations providing data.

4.2 Data Flow

When you click on the **Data Flow** link, you are taken to the Data Flow pane (Data Quality Dashboard>Data Quality>Data Flow). The same count grid cards displayed on the Overview pane are displayed at the top of this pane (see Section [4.1.1 Summary Counts](#)). There are also graphs for Processed Messages with Visit Comparison, Exception Reasons, and Filter Reasons, as described in section 4.3.

4.2.1 Summary Counts

Refer to Section 4.1.1 Summary Counts for more details.

4.2.2 Processed Messages with Visit Comparison

Processed Messages are displayed as a daily bar graph for the last 60 days with the final day being the most current day's processed messages. In addition, two line graphs depict Processed Visits and ESSENCE Visits. (**Note:** Processed and ESSENCE Visits are usually the same; when that occurs, the ESSENCE line graph overlays the Processed Visits graphed data.)

By hovering over any bar of the daily processed messages, a popup will provide exact counts of the Processed Messages, Processed Visits, and ESSENCE Visits.

The colored keys above the graph are interactive. Click a **color** to toggle off that count and remove it from the graph. Click the same **color** again to toggle its count back on and add it back to the graph.

Reminder:

Since Processed Messages counts are significantly larger than visit counts, it can be helpful to toggle these off and look for patterns in the Processed and ESSENCE graphs.

QUICK TIPS 

4.2.3 Exception Reasons

There are three reasons that a message would be Exceptioned. They are:

- C_Facility_ID was not an active facility at time of message processing,
- C_Visit_Date_Time is set in the future, or
- Message did not include valid C_Unique_Patient_ID.

Days that have no bar didn't have measurable exceptions. You can check this for any day by hovering over that day on the chart. A popup will be displayed showing the exact count for each reason mentioned above.

To get a better view of reasons that only show as a small part of individual bars, try toggling off one or two of the other reasons.

4.2.4 Filter Reasons

A message would be filtered if there is no message date/time for HL7. In formats other than HL7, the field converting to message date/time would trigger the filter (i.e., MSH7 is present).

Days that have no bar didn't have measurable counts. You can check counts by hovering over any day on the chart. A popup will be displayed showing the exact count for the reason mentioned above.

4.3 Completeness

The Completeness link opens the Completeness by Visit pane (Data Quality Dashboard>Data Quality>Completeness). This pane displays Average ED Completeness by Visit, Completeness by Visit Over Time, and Completeness by Visit.

4.3.1 Average ED Completeness

The Average ED Completeness by Visit is a percentage displayed, rounded to two decimal places, e.g., 96.54 %. This is the average completeness by visit over a 2-month period ending the date of the last day messages were processed.

4.3.2 Completeness by Visit Over Time

The Completeness by Visit Over Time graph is a multi-variable line graph displaying several Completeness elements. Those elements are determined by the Completeness filters (Default—Priority 1 filter group). This can be changed by clicking the **Filters** button on the right, selecting the Completeness Filter Option, and modifying the filter elements currently selected.

Hovering over any day on this graph will display all filtered elements with their Completeness percentage for that day.


4.3.3 Completeness by Visit

The Completeness by Visit bar graph shows overall completeness for each filtered element. These are sorted in descending order with all elements that are 100% complete at the top.

Hovering over any bar on this chart will pop up a display showing the filtered element represented and the percent complete.

4.3.4 Group By Settings

The Completeness by Visit Over Time and Completeness by Visit graphs can be grouped by Facility_Name, Facility_Type, Feed_Name, Parent_Organization, and Vendor_Name. Using this Group By functionality, you may analyze timeliness to isolate possible issues.

Click on the Settings  icon, then select a type to group by.

4.4 Validity

The Validity pane (Data Quality Dashboard>Data Quality>Validity) displays three grid cards similar to the Completeness pane. These are Average ED Validity by Visit, Validity by Visit Over Time, and Validity by Visit.

4.4.1 Average ED Validity by Visit

The Average ED Validity by Visit is a percentage displayed, rounded to two decimal places, e.g., 96.54%. This is the average completeness by visit over a 2-month period ending the date of the last day messages were processed.

4.4.2 Validity by Visit Over Time

The Validity by Visit Over Time graph is a multi-variable line graph displaying several Validity elements. Those elements are those that the Validity filter is set for (Default—Priority 1 filter group). This can be changed by clicking on the **Filters** button on the right, selecting the Validity Filter Option, and modifying the filter elements currently selected.

Hovering over any day on this graph will display all filtered elements with their Validity percentage for that day.


4.4.3 Validity by Visit

The Validity by Visit bar graph shows overall completeness for each filtered element. These are sorted in descending order with all elements that are 100% complete at the top.

Hovering over any bar on this chart will pop up a display showing the filtered element represented and the percent valid.

4.4.4 Group By Settings

The Validity by Visit Over Time and Validity by Visit graphs can be grouped by Facility_Name, Facility_Type, Feed_Name, Parent_Organization, and Vendor_Name. Using this Group By functionality, you can analyze timeliness to isolate possible issues.

Click on the Settings  Icon, then select a type to group by.

4.5 Timeliness

The Timeliness pane has similarities to the Completeness and Validity panes. Like the others, there are three grid cards displaying for Timeliness:

- Average Timeliness from Visit to First Message Received (hours based on selected filters),
- Average Time Delayed (Hours) from Visit to First Message Received,
- Timeliness by Visit.

4.5.1 Average Timeliness from Visit to First Message Received

The Average Timeliness from Visit to First Message Received is stated in hours, rounded to two decimal places. If you change the Timeliness filters, the hours may change.

4.5.2 Average Time Delayed (Hours) from Visit to First Message Received


The Average Timeliness from Visit to First Message Received graph shows weekly data points as Timeliness is recalculated weekly.

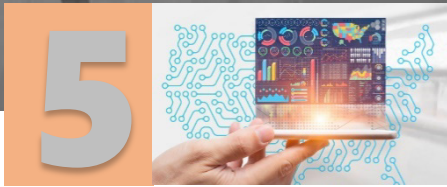
4.5.3 Timeliness by Visit

The Timeliness by Visit graph is displayed as a horizontal stacked bar graph. It compares the proportions of the timeliness (in percentages) of selected visits. This provides a measure of time delay from the date and time of a visit until the first message for that visit is received by the BioSense Platform.

Timeliness is categorized by less than or equal to 24 hours (≤ 24 Hrs), shown in Green; greater than 24 hours and less than or equal to 48 hours (> 24 Hrs and ≤ 48 Hrs), shown in Yellow; and greater than 48 hours (> 48 Hrs), shown in Red.

The Average Time Delayed (Hours) from Visit to First Message Received and the Timeliness by Visit graphs can be grouped by Facility_Name, Facility_Type, Feed_Name, Parent_Organization, and Vendor_Name. Using this Group By functionality, you may analyze timeliness to isolate possible issues.

Click on the Settings  Icon, then select a type to Group By.



Alerts Section

The Alerts section links to a Summary of alerts, an alert Viewer, Rule Profiles (a rule viewer), and the Rule Builder pages.

The navigation path preface displayed in the Top Menu is Data Quality Dashboard > Alerts >.

5.1 Summary—Rules & Alerts Overview

This page (Figure 10) displays a table showing the rules and number of alerts they generated over the date range noted on the Data Quality > Overview page. In addition, stacked bar graphs for active and inactive rules are displayed below the table (Summary Graphics) for quick analysis.

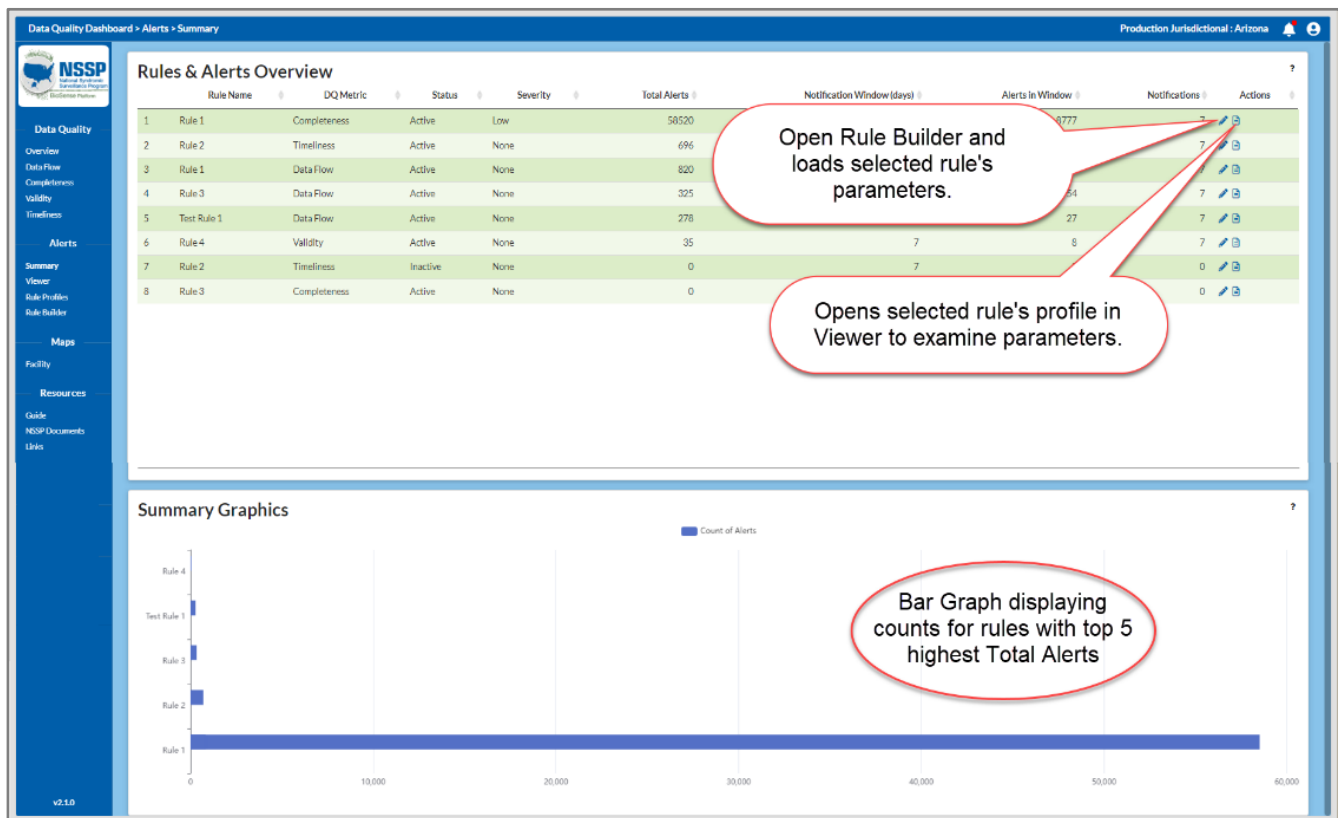


Figure 10. Alert Summary—Rules & Alerts Overview

5.2 Summary – Summary Graphics

Figure 11 is a snapshot of the Rules & Alerts Overview table with Summary Graphics with a rule highlighted (Rule 2). The line graph shows the number of messages received over the last 90 days.

Hovering over a point on the graph will pop up the date and the alert count for that day.

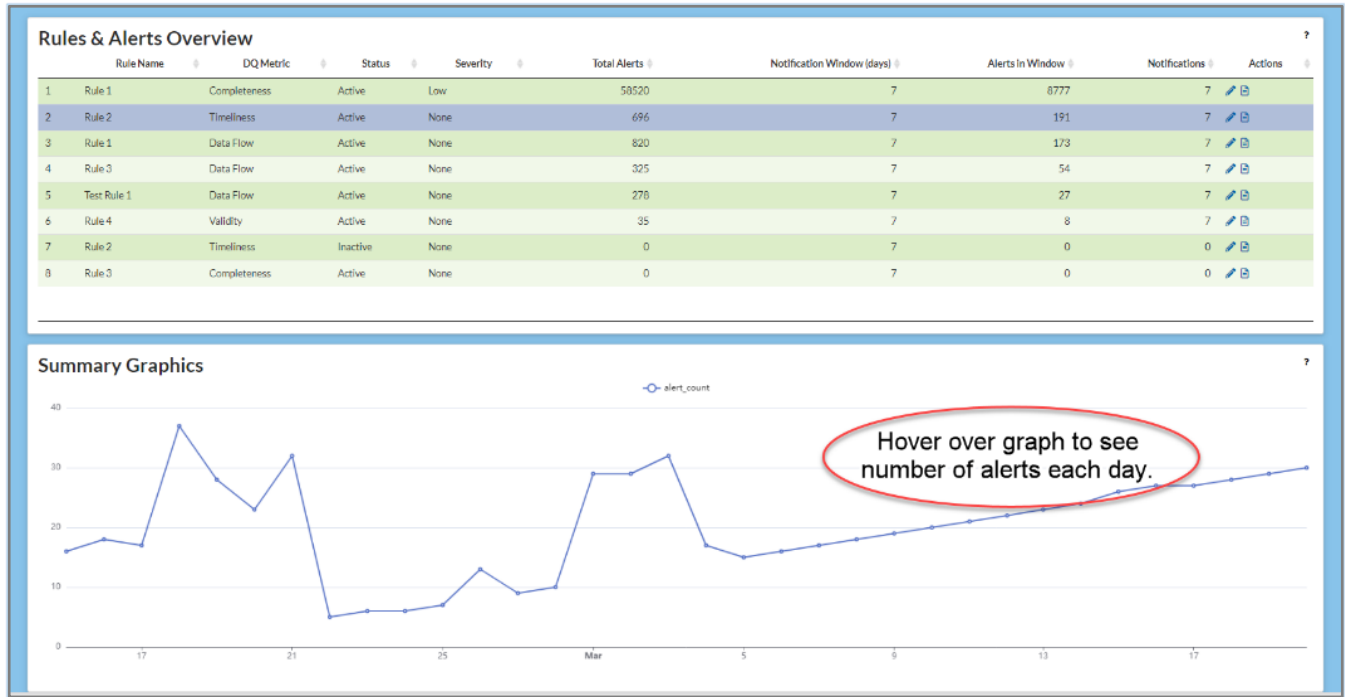


Figure 11. Alert Summary Graphics—Rule 2 Highlighted

5.3 Alert Viewer—No Alert Selected

The Alert Viewer provides a table of alerts since the last job.¹ When an individual alert is selected, comments or questions can be associated with it. This could be useful for asking questions or recording results of any investigations you may have conducted concerning the highlighted alert. Note that no comments or data on detections over time are shown in Figure 12 because no alert has been selected (highlighted).

¹ Each night, beginning at 00:00:00 UTC, batch jobs run to collect and process the previous day's messages. These data are combined with previous data, and any new alerts generated are added to the Alert list.

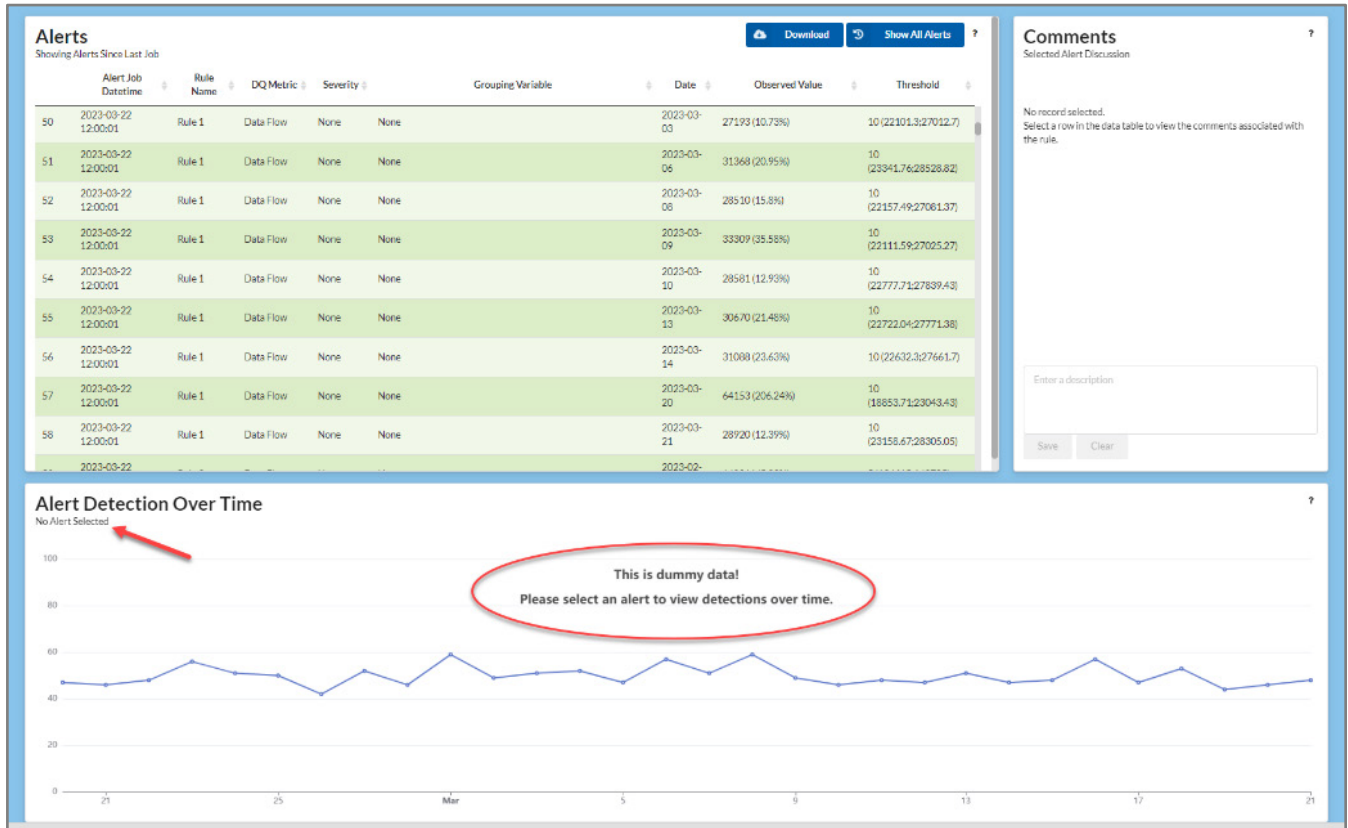


Figure 12. Alert Viewer (No Alert Selected)

5.4 Alert Viewer—Alert Selected

By highlighting a row in the table, you may view previously recorded comments and enter a comment in the field provided at the right (Figure 13). Note that comments are associated with rules, not alerts.

In addition, the Alert Detection Over Time graph is populated to show the count of all alerts based on the date range specified by the Date filter.

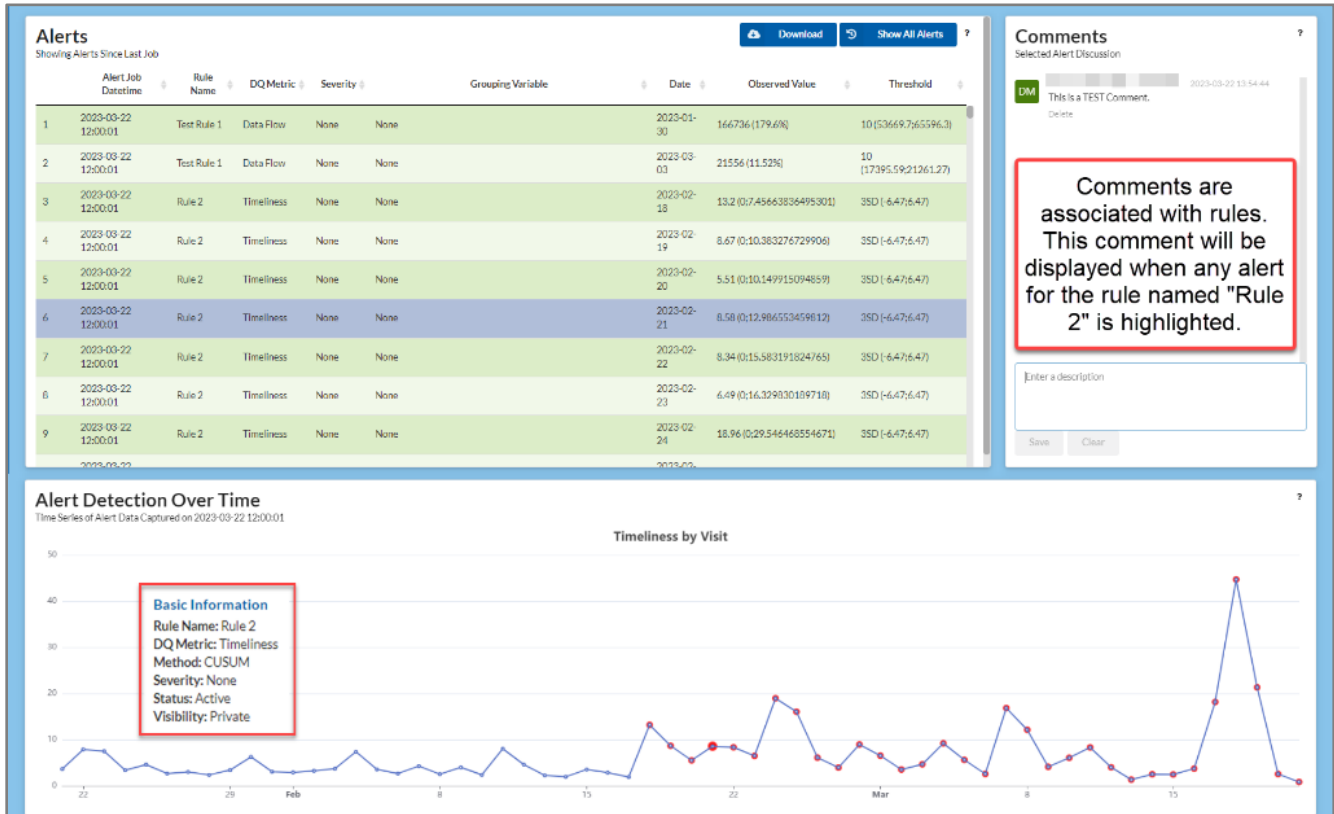


Figure 13. Alert Viewer (Alert Selected)

5.5 Rule Profiles

The Rule Profiles table is displayed when the **Rule Profiles** button is selected on the Navigation Menu. All active and inactive rules are displayed, and each has a rotating expander (**>** / **v**) on the left. When you click on the rotating expander (>), it turns to point down (v) and displays detailed information about the rule below its row (Figure 14).

The screenshot displays the 'Rule Profiles' table in the Data Quality Dashboard. The table has columns for Rule Name, Status, and Severity. Rule 2 is expanded, showing detailed information. Callouts highlight specific UI elements:

- Rotating Expanders:** > - Compressed, v - Expanded
- Activate/Deactivate Rule** (Callout pointing to the 'Activate/Deactivate Rule' button in the Actions column)
- Edit Rule (Open Rule Builder)** (Callout pointing to the 'Edit Rule' button in the Actions column)
- Delete Rule (Cannot Be Undone)** (Callout pointing to the 'Delete Rule' button in the Actions column)

Rule Name	Status	Severity	Actions
1 > Test Rule 1	Active	None	[Activate/Deactivate] [Edit] [Delete]
2 > Rule 2	Inactive	None	[Activate/Deactivate] [Edit] [Delete]
3 v Rule 2	Active	None	[Activate/Deactivate] [Edit] [Delete]
4 > Rule 1	Active	None	[Activate/Deactivate] [Edit] [Delete]
5 > Rule 3	Active	None	[Activate/Deactivate] [Edit] [Delete]
6 > Rule 1	Active	Low	[Activate/Deactivate] [Edit] [Delete]
7 > Rule 4	Active	None	[Activate/Deactivate] [Edit] [Delete]
8 > Rule 3	Active	None	[Activate/Deactivate] [Edit] [Delete]

Figure 14. Rule Profile Table—Rule 2 Expanded

5.6 Rule Builder

The Rule Builder (Figure 15) allows you to view and modify existing rules and create new ones.

When you first open the Rule Builder or change a parameter in the Basic or Method Options, you are advised to click the “Preview” **Refresh** button to update the visualization of your current rule parameters. This is the message in the Preview frame:

This is dummy data! Press the “Refresh” button to get started.

The screenshot shows the Rule Builder interface with the following sections:

- Basic Options:** Rule Name, DQ Metric (Data Flow), Message Type (Processed), Grouping (None), Alert Method (Percent Change), Severity (None), Custom Description.
- Method Options:** Threshold (10 percent of messages), Directionality (Above), Guardband (0 days from max date), Width (7 days in method baseline), Baseline Metric (Mean), Minimum Total (1 anomalies in width), Minimum Consecutive (1 anomalies in width), Days In Calculation (S, M, T, W, T, F, S), Days with Alerts (S, M, T, W, T, F, S).
- Notification Options:** Notification Window (7 days), Minimum Alerts for Notification (1 alerts), Maximum Notifications in Window (50 notifications).
- Autogenerated Description:** This rule applies to site 'Alabama'. Only Message Type 'Processed' are filtered. Only observations within a 7-day rolling width over the course of the previous 60-day rolling period are monitored for alerts. It monitors data flow data, triggering an alert when observations within a rolling mean baseline of 7 days exceed a change of 10%. Alerts may trigger up to the most recent available date. All weekdays are included in calculating in-width alerts and there is no alert suppression. Only one anomaly detected within the 7-day baseline is necessary to trigger an alert.
- Preview:** A line chart showing data points over time. A red oval highlights the text: "This is dummy data! Press the 'Refresh' button to get started." A Refresh button is visible in the top right of the preview area.

Figure 15. Rule Builder Configuration Page

After you refresh the Preview pane the first time, a different message will be displayed if you alter any options on the Rule Builder pane. Note the message “*Change detected! Refresh to update preview!*” in Figure 16.

The screenshot shows the Preview pane with the following elements:

- Preview:** A header for the preview section.
- Change detected! Refresh to update preview!**: A red message indicating that the data has changed.
- Refresh ?**: A blue button with a refresh icon and a question mark, used to update the preview.

Figure 16. Rule Builder Preview—Change Detected

When choosing Alert Methods, the Preview visualization may display somewhat differently and may or may not show the green 7-day average threshold band as shown in Figure 17 below.

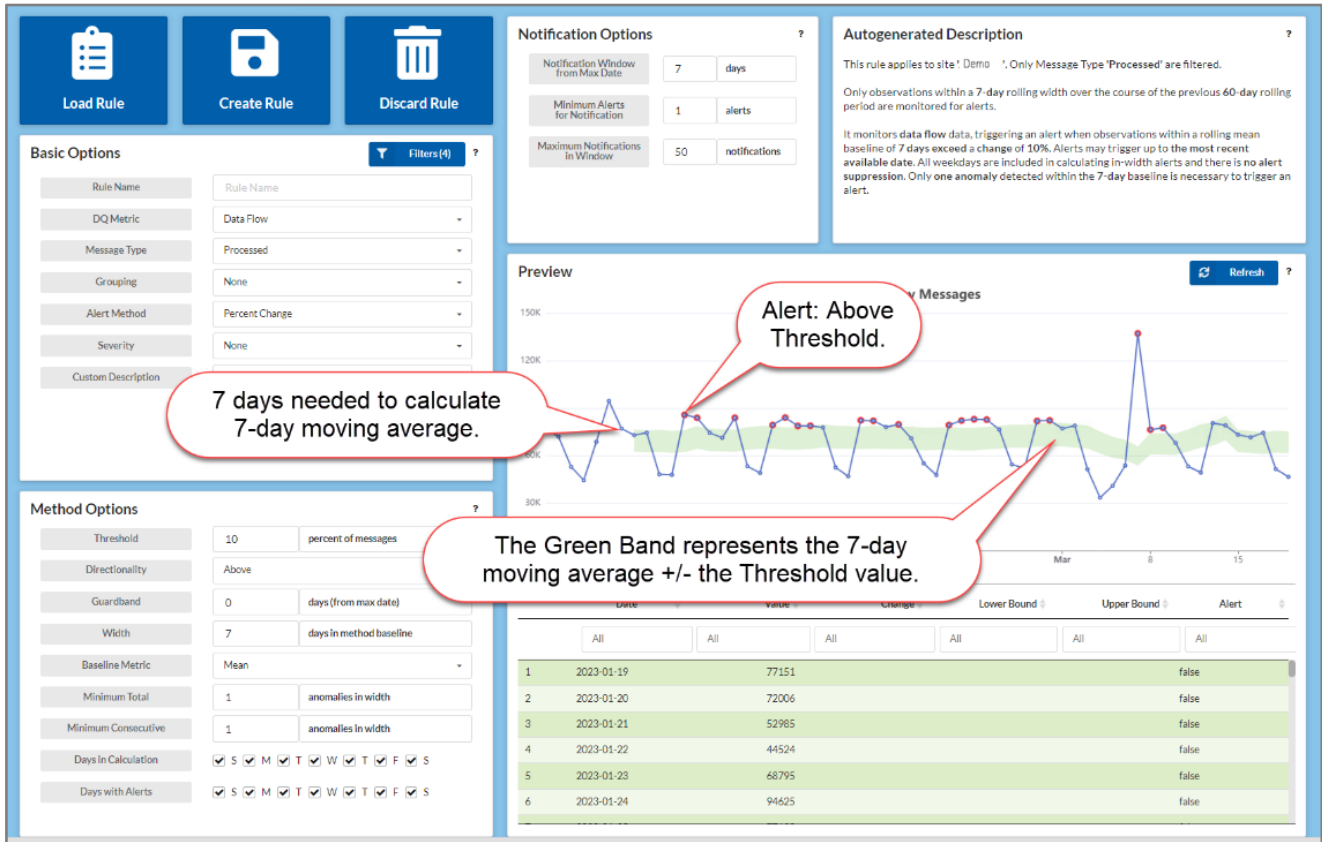


Figure 17. Preview shows Alerts where Threshold was Exceeded, and the Green Band denotes a 7-day Moving Average.

5.7 Rule Builder—Basic Options

The *Basic Options* panel allows you to name your rule for ease of identification and set up basic parameters for the rule. This is located beneath the **Load Rule**, **Create Rule**, and **Discard Rule** buttons.

In the upper right of the Basic Options section, the **Filters(n)** button displays the Filter Selection for Rule Building pane where you can apply filters to subset underlying data. Default filters include the most recent 60 days and Priority 1 element group (Default n = 4).

QUICK TIPS



Special Filter Configurations are NOT Transferred to Rule Builder

The **Filters(n)** button in the Basic Options section of the Rule Builder is NOT associated with the **Filters** button on the right side of the main screen. If you have a special filter configuration set up for your use on the main screen, it is NOT transferred to the Rule Builder. Please set up your special filter configuration for the Rule Builder, if desired.

QUICK TIPS




Filter Selection for Rule Building

The *Filter Selection for Rule Building* defaults to Date range (60 days ending on the most current date data is available), Site selection (currently your site is automatically selected), Completeness Elements (the Priority 1 element group), and Validity Elements (the Priority 1 element group).

You may modify or delete these and add other filters to modify a selected rule or build a new rule.

Note: Checking the Date Lock checkbox on the Date filter will force the rule to use the selected dates explicitly. When a date locked rule executes with dates outside the available data (120 days), this filter option will revert to the default range of the most recent 60 days.

Click the question mark  icon to the right of the **Filters(n)** button for an in-depth explanation of the selectable parameters described below. This is a summary only.

5.7.1 Rule Name

Rule names are alphanumeric, and spaces are allowed. Maximum length is 255 characters, but only the first 50 characters can be displayed.

5.7.2 DQ Metric

Options are Data Flow, Timeliness, Completeness, and Validity. Changing the DQ Metric value will automatically change the Threshold units and alter the Units in the *Method Options* panel (Section 5.8).

5.7.3 Message Type

Options are Processed, Exception, or Filtered.

5.4.4 Grouping

This selection allows for grouping that is similar to Group By, as discussed in Section 2.4—Stratify or Group By and Facet By controls. Grouping types include None, Site, Facility Name, Feed Name, Vendor Name, Parent Organization, Facility Type, HHS Region, and Data Element.

5.4.5 Alert Method

- CUSUM—Cumulative sum control chart for monitoring change detection
- EWMA—Exponentially weighted moving average
- Percent Change—Significant changes in proportions of message counts or of existing percentages
- Value Limit—Numeric thresholds designated in rule creation that trigger anomalies when crossed.

5.7.6 Severity


Degree of importance or severity, as set by user (e.g., None, Low, Medium, High).

5.7.7 Custom Description

This application will automatically generate a description of your rule based on the Basic and Method Options you select. In addition, you may enter a custom description of your rule. At least 2,000 characters are provided for your custom description.

5.8 Rule Builder—Method Options

The *Method Options* panel contains dynamic, method-specific rule parameters that adjust according to your selected alert method in the *Basic Options* panel above.

Click the question mark  icon to the right of the *Method Options* title for an in-depth explanation of the selectable parameters described below.

5.8.1 Threshold

Numeric limit (either integer, percent, or proportion) that constitutes an anomaly when breached. The “units” field is auto populated based on the *Basic Options* “Alert Method.”

5.8.2 Directionality

A breach can be “Above” (or exceeding) the threshold value, falling “Below” the threshold value, or “Both” (i.e., either above or below the threshold value).

5.8.3 Guardband

Number of recent days to ignore alerts—for example, the number of days could be 1–31. During this period, the “Guardband” would prevent false alerts due to lagging observations.

5.8.4 Width

This is the number of days in the baseline metric. In other words, it is the number of days to be used in rolling window calculations (for example, to calculate moving average or cumulative sums used in counting the rule breaches needed to trigger alerts).

5.8.5 Baseline Metric

This is used for calculating when an actual alert should be created when the “Percent Change” method is used. The values “Mean” and “Median” are available.

5.8.6 Minimum Total

The minimum number of anomalies occurring in the “Width” rolling window needed to trigger an alert.

5.8.7 Minimum Consecutive

The minimum number of consecutive anomalies occurring in the “Width” rolling window that are needed to trigger an alert.

5.8.8 Days in Calculation

Seven checkboxes (labeled for each day of the week) to be used in calculations for alerts.

5.8.9 Days with Alerts

These seven checkboxes (labeled for each day of the week) are used to designate days where alerts can be sent. The dashboard will not send alerts on unchecked days. **Note:** Excluded days will still be used in calculations and anomalies unless excluded in “Days in Calculation,” as described in 5.8.8.

5.9 Rule Builder—Notification Options

The “Notification Options” panel allows input of universal parameters pertaining to minimum required alerts to warrant notification and the maximum number of notifications that may be delivered.

5.9.1 Notification Window from Max Date

Use this to set the total number of days prior to the current system date, during which time alerts may trigger notifications.

5.9.2 Minimum Alerts for Notification

Use this to define the total number of alerts required during a “Notification Window from Max Date” range to trigger sending a notification email.

5.9.3 Maximum Notification in Window

This is used to specify the maximum number of email notifications that may be sent during the “Notification Window from Max Date” range.

5.10 Autogenerated Text

The Rule Builder automatically generates a description for the Basic, Method, and Notification Options selected and displays it in the “Autogenerated Description” panel.

5.11 Rule Builder—Preview

The Preview card will apply your new or modified rule to your current data for the previous 60 days (Figure 18). Just click the **Refresh** button in the upper right of the Preview to update this card anytime you create a new rule or modify an existing one.

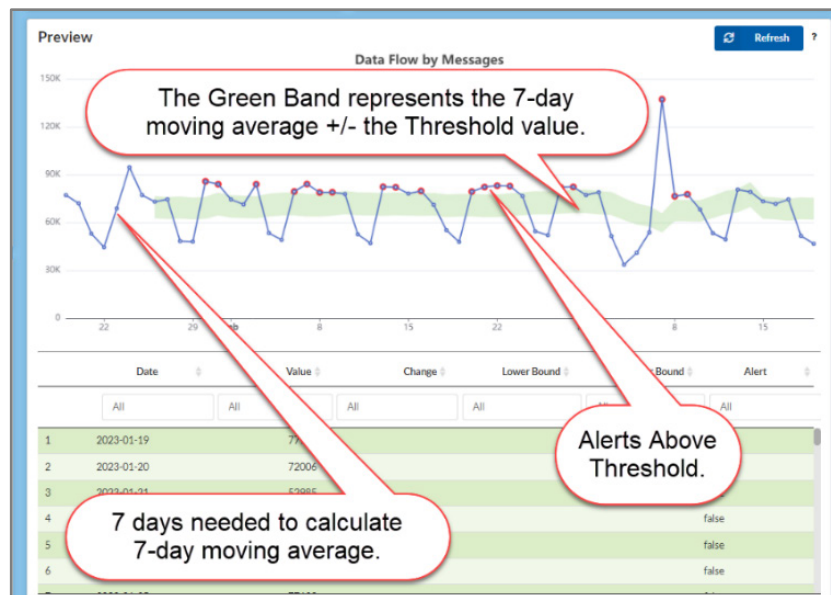


Figure 18. Rule Build Preview Card

5.12 Rule Builder—Loading an Existing Rule for Inspection or Change

In the Navigation Menu, click on **Rule Builder**, then click on the clipboard icon **Load Existing Rule**. The Load Existing Rule dialog box (Figure 19) will be displayed.

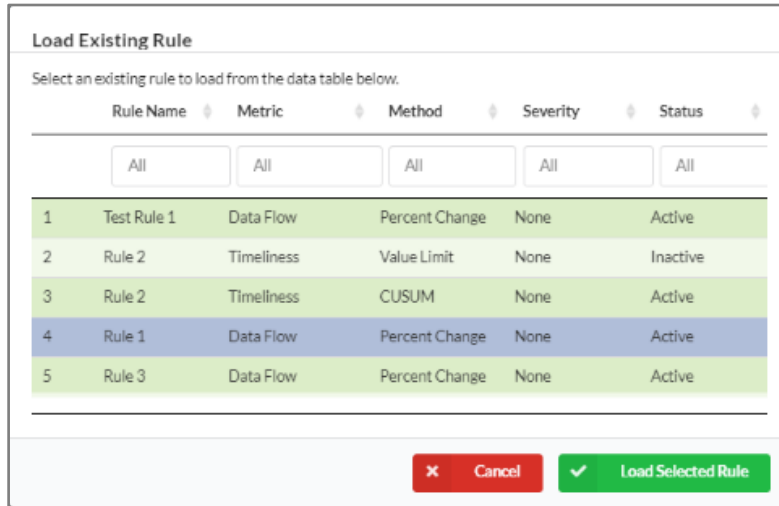


Figure 19. Load Existing Rule Dialog Box

Highlight the rule you want to view or modify, then click on the **Load Selected Rule** button. This will load the rule parameters into the Rule Builder (Figure 20).

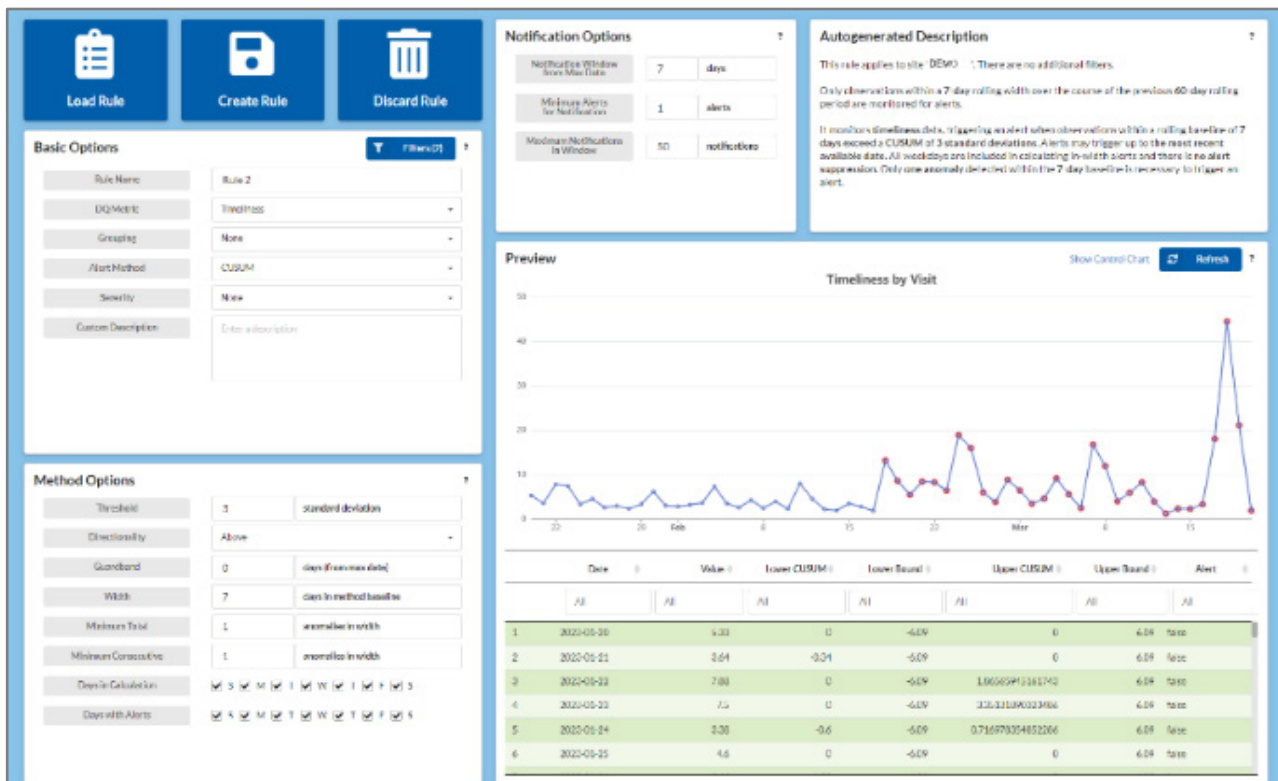
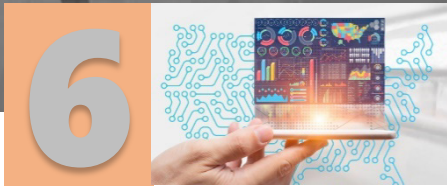


Figure 20. Rule Builder with Existing Rule Loaded



Maps Section

Clicking on **Maps > Facilities** link displays a map of the United States (Figure 21), or a section thereof, with the primary facilities indicated. Depending on the map scale, indicators may consolidate several facilities in one group indicator.

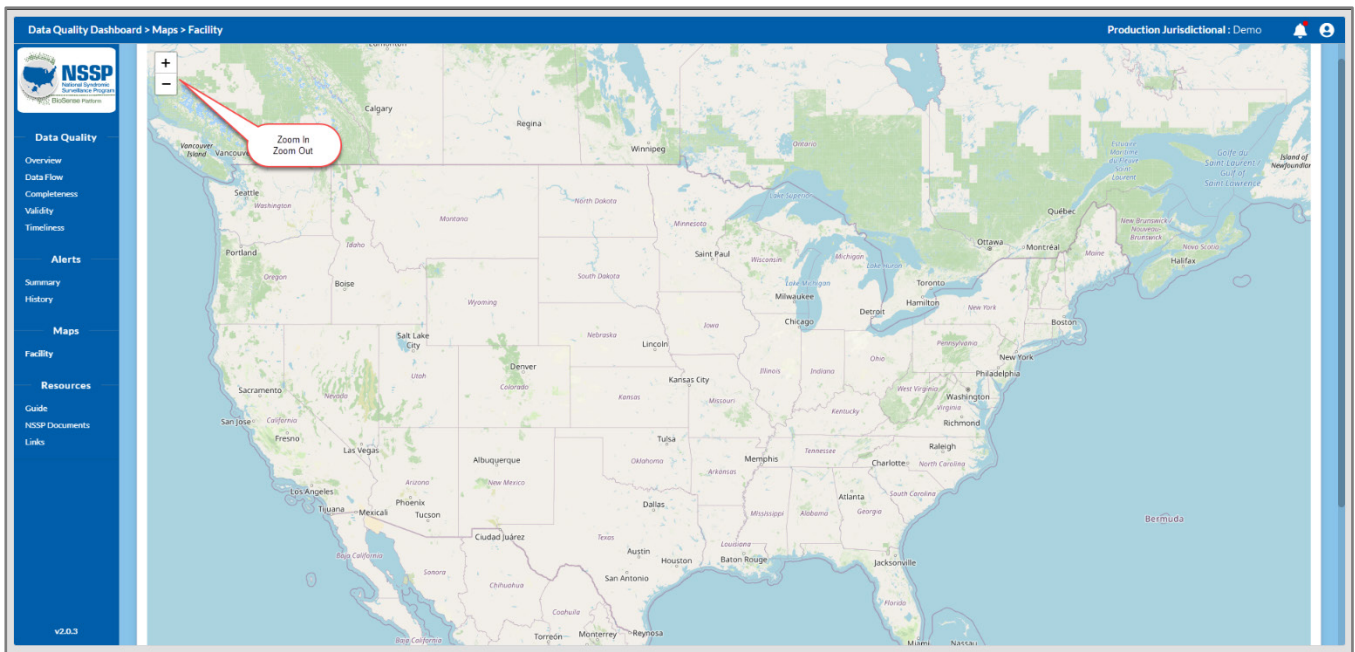





Figure 21. Typical Map Showing Plus (+) and (-) Zoom Buttons

The map has a + or – icon to expand or shrink the map (i.e., zoom in or out).

Note: Facility pins  and Group indicators  have been removed from Figure 21 to preserve site anonymity.

6.1 Facility Group Indicators

Whenever a facility group indicator  is displayed, the number in that indicator represents the number of primary facilities and sub-groups represented by the indicator. Hovering over a group will display the approximate geographical area covered by that group.

Group indicators are color coded to quickly indicate the relative size of groups (Figure 22).



Figure 22. Facility Group Indicator Codes

6.2 Expanding Group Indicators

You may expand a facility group indicator by clicking on it. This effectively zooms in to expand the map in the vicinity of the group indicator. The result may show all the facility pins or a mix of facility pins and smaller sub-groups. You may also zoom in by clicking on the plus (+) button in the upper right-hand corner of the map.

6.3 Facility Pin—Summary Data


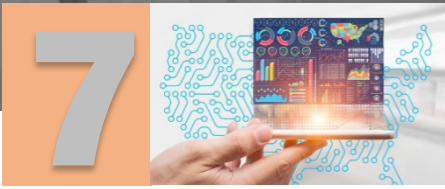
Hovering over a facility pin  will cause the facility name to be displayed; and if you click on it, the information in Table 4 from the site’s MFT will be displayed:

Table 4. MFT Information Stored in Facility Pin	
Address	Feed Name
Facility Status	Vendor Name
Facility Type	Parent Organization
	Date Activated

6.4 Misplaced Facility Pin Error

Occasionally, you may encounter one of your site’s facility pins appearing in a completely different geographical area, e.g., an Alabama facility located in Arizona. Typically, this is due to a data entry error where the Geographic Coordinates (longitude or latitude) in the MFT were entered incorrectly.

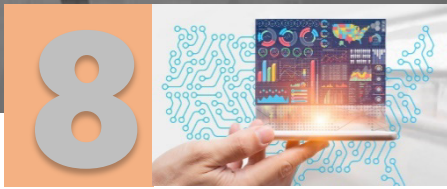
Please verify these data points in your MFT before reporting this as an error. If the Geographic Coordinates listed in the MFT are correct, please open a ticket with the Nssp support team at support.syndromicsurveillance.org and attach screenshots showing any Facility Pins incorrectly located.



Resources Section

- **Guide:** This link opens the latest published DQ Dashboard guide or user manual within the application itself. A separate copy may be opened in the Technical Publications and Standards page in the NSSP Technical Resource Center website at [NSSP Technical Publications and Standards](#).
- **NSSP Documents:** This opens the NSSP Technical Resource Center webpage within the application. This webpage may also be opened separately at [NSSP Technical Resource Center](#).
- **Links:** This displays a webpage with miscellaneous links of possible interest.

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Percent of Data Selected and Filter Selection

On the right side of the application display is a chart depicting the percent of the total data available that has been selected for analysis. By default, this is initially set up to select the past 60 days of data out of a possible 120 days available. **Note:** To adjust this date range, click the **Filters** button in the Selected Filters section below and modify the Date filter (see [Use of Filters](#) section for details).

8.1 Percent of Data Selected

The chart in Figure 23 displays the percent of data selected for analysis. Data are selected by data range, and percentages are calculated on that basis.

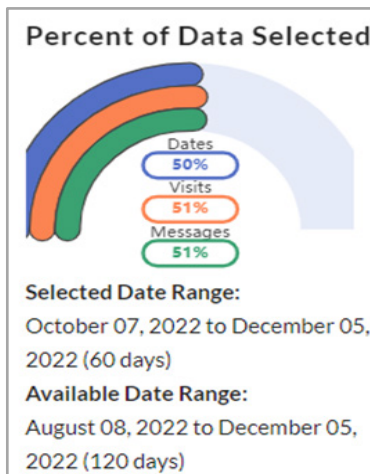


Figure 23. Percent Selected

Percentages are presented as a color-coded graph with three bands. Labeled numeric percentages are displayed under this curved bar graph. Graph colors are as follows:

- **Blue** represents the percentage of the total dates available that are in the selected data range.
- **Orange** represents the percent of visits in the selected data range.
- **Green** represents the percent of messages in the selected data range.

The actual percentages of available dates, visits, and messages are calculated and displayed under the curved bar chart.

Directly below these graphic representations, the selected and available date ranges are given as specific calendar dates, and the number of days in those ranges are displayed in parentheses.

8.2 Modifying Selected Filter

Below the Percent of Data Selected chart is a section for filters. Here, the default filters are displayed in collapsed format. Select the **Filters** button to subset data differently.

The default filter sets are listed and may be viewed in detail by clicking on the revolving **triangle icon** ► beside each type, but you must click the **Filters** button to modify the selected filters.

- **Date:** This is the same date range as you see in the selected date range displayed under the Percent of Data Selected chart above. The default range is the past 60 days based on the previous day's date which is the most current data date.
- **Site (1):** This is your site. This is not changeable in the Filter Selection pop-up.
- **Completeness Elements (17):** These are the Priority 1² group elements selected for inclusion in the Completeness analysis.

² See [Table 5 Default Completeness Elements](#) for a list of the Default (Priority 1) and [Table 6 Additional Completeness Elements](#) for additional Completeness Elements filters.

- **Validity Elements (10):** These are the Priority 1³ group elements selected for inclusion in the Validity analysis.

Clicking on the **Filters** button opens the Filters Selection dialog. Default filters may be modified or deleted here, and new filters may be added. Figure 24 is a screenshot of the Filter Selection dialog.

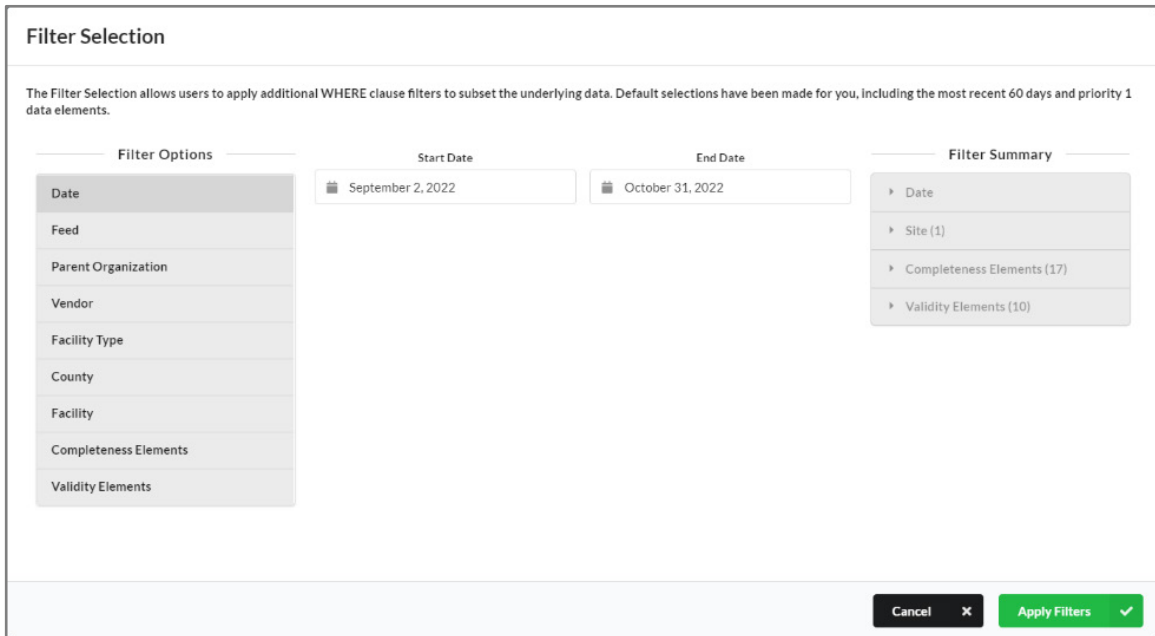
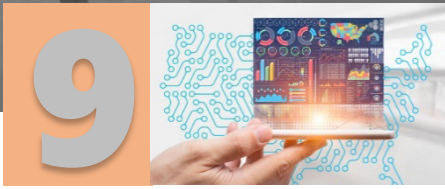


Figure 24. Filter Selection Dialog

³ See [Table 7 Default Validity Elements](#) and [Table 8 Additional Validity Elements](#) for Validity Elements filters.



Data Quality

When you select various charts from the Data Quality section on the Navigator Menu, you may view additional information to assist in evaluating data. Below we discuss the various links and their charts.

9.1 Overview

Just a reminder: The Overview link is similar to a “Home” button. Clicking **Overview** will return you to the Overview page. This page is discussed in detail in [Section 2.1](#).

9.2 Data Flow

The Data Flow page allows you to identify site processing issues by visualizing the total message count and percentage of messages processed, filtered, or exceptioned.

As incoming messages are processed into the “Raw” table, the BioSense Platform checks the messages to make sure each contains the minimum information required to process them to the next level where they are stored in the “Processed” table.

If one or more checks fail, the message is flagged with a status of “Filtered” and is not processed further. Filtered messages are those that do not meet basic HL7 requirements. As messages that meet HL7 requirements progress from “Raw” to “Processed” tables, the BioSense Platform applies additional checks to assess validity of the Facility Identifier, Patient Identifier, and Visit Date. These critical data elements are used to form a unique BioSense Identifier. If one or more of these checks fail, the message is moved to the Exceptions table and is not processed further.

For more detail on Filter and Exception reason codes and descriptions, refer to the *NSSP Data Dictionary* available on the [NSSP Technical Resource Center website](#).



Notes on Data Flow Refresh

Data Flow graphics are updated daily between 06:00:00 UTC and 10:00:00 UTC and are based on data that arrived on the platform by 00:00:00 UTC. Data currently used in calculating the Data Flow graphics include the previous 120 days of data (based on arrived_date).

CAVEAT: Filtered messages and some Exceptioned messages do not contain facility information. Therefore, the Facility, Parent Organization, Vendor, and Facility Type filters cannot be used to subset these message counts or percentages in the visualizations. Using filters for one or more facilities, parent organizations, vendors, or facility types will yield no Filtered message information and, at best, only some Exceptioned message information in the Data Flow page visualizations.

When you click the **Data Flow** link in the Navigator Menu, the Data Flow page is displayed (Figure 25). You will see the counts for Processed, Exceptioned, and Filtered messages on the small grid cards along with a stacked horizontal bar graph representing these values at the top of the page. This is the same information displayed on the Overview page described in [Section 2.1](#). Below that, there are individual grid cards showing detailed bar graphs for Processed Messages with Visit Comparison, Exceptions Reasons, and Filter Reasons.



Figure 25. Data Flow Page Selected from Navigator Menu

Here are more detailed descriptions of these individual grid cards:

- Processed Messages with Visit Comparisons grid card shows a vertical bar graph of daily processed messages with two-line graphs overlaying the bar graph. These line graphs compare Processed Visits and ESSENCE Visits. Because Processed and ESSENCE Visits are usually equal, these lines are normally overlaid and appear as one.
 - Due to the scale of the chart, small differences may not be evident (see Figure 26 for an example).
 - The Visit Comparison lines allow users to identify ESSENCE backlogs or other processing issues. The lines indicate your site’s Processed Visits Count and ESSENCE Visits Count by `c_visit_date`. The Processed Message counts (vertical bars) are calculated by summing the total messages (by `arrived_date`). The Processed and ESSENCE visits counts by `C_Visit_Date` are displayed as purple and orange lines. You can hover over a bar or line to display exact number of Processed Messages, Processed Visits, and ESSENCE Visits.

Note: The ESSENCE visits count will likely differ from the Processed visit count for the previous day's C_Visit_Date due to the timing of replication. This does not indicate a processing issue unless the counts remain unequal over time.

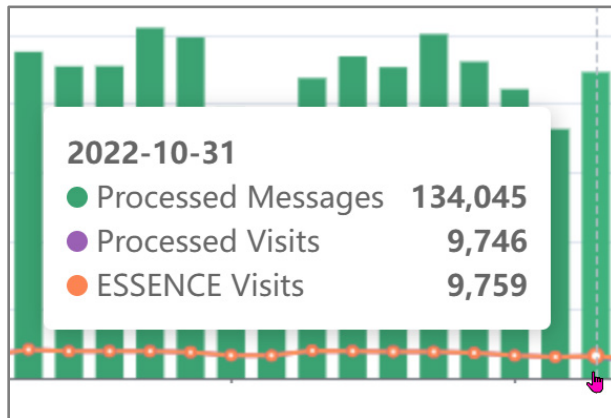


Figure 26. A comparison of Processed and ESSENCE Visit Counts reveals that minor differences are not visible on this chart.

- A second individual grid card displays a stacked bar graph of Exception Reasons (Figure 27).
 - Blue represents the number of messages where C_Facility_ID was not an active facility at the time of message processing.
 - Green represents the number of messages where C_Visit_Date_Time was a future date.
 - Yellow represents the number of messages without a valid C_Unique_Patient_ID.

Note: All three of these color codes can be seen in the fourth bar in Figure 27.



Figure 27. Exception Reasons

The last individual grid card on the Data Flow page is the Filter Reasons visualization (Figure 28). This displays your site’s filtered message counts by arrived_date and is stacked to differentiate filter reasons. They will only appear in the graph if your site has messages filtered on a specific arrived_date.

This stacked bar graph displays the reasons messages were not processed. Only days with filtered, unprocessed, messages would have bars on this graph.

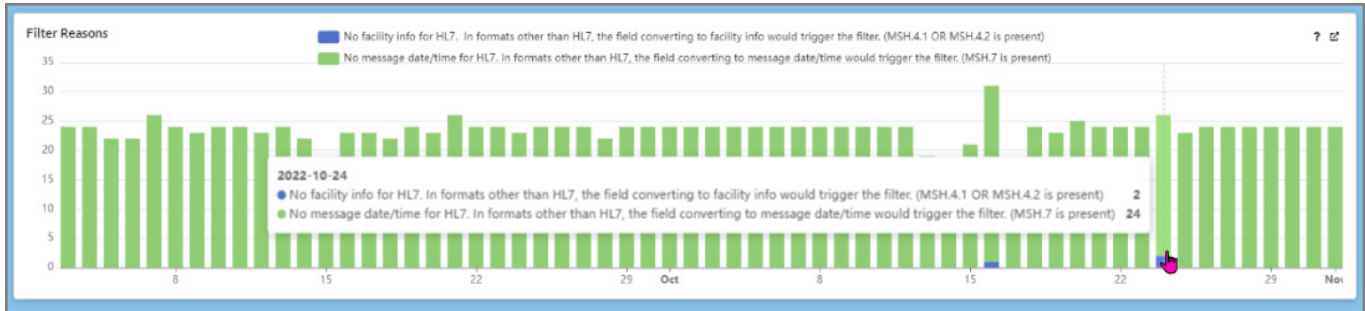




Figure 28. Filter Reasons

There are two reasons that messages might be filtered before processing:

- Blue represents the number of messages in which 1) no facility information exists for HL7 messages, or 2) there is no information in the field converting to facility information for formats other than HL7 (MSH.4.1 OR MSH.4.2 is present).
- Green represents the number of messages in which 1) no message date/time exists for HL7 messages, or 2) there is no information in the field converting to message date/time for formats other than HL7 (MSH.7 is present).

As with graphics described above, the expanded bar graph with a table of values can be viewed by clicking the  icon in the upper right of each of the graph grids. This is the same graph and table displayed when clicking on this icon  for the Data Flow graph on the Overview page.

9.3 Completeness

When you click **Completeness** link in the Navigator Menu, the Completeness page is displayed with three grid cards or sections (Figure 29). On the upper left, the Average ED Completeness by Visit is displayed as a percent of HL7 messages complete (no missing elements) based on the filters selected. This percentage is displayed in large font and rounded to two decimal places. (**Note:** If second decimal is zero, only one decimal place is shown.)

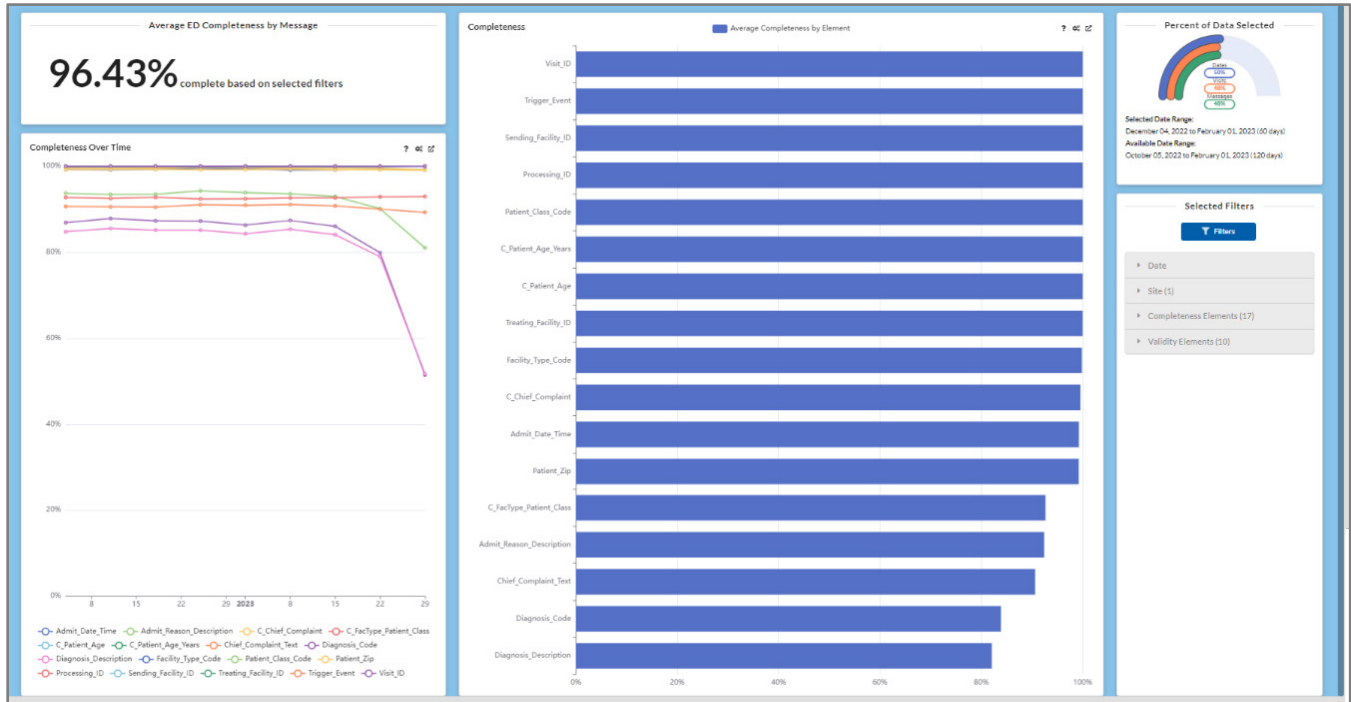


Figure 29. Completeness Page Selected from Navigator Menu

Average ED Completeness by Visit percentage is derived by counting all filtered messages that were complete (i.e., with no missing elements) and dividing by the total number of messages sent that met filter criteria (i.e., including those messages with missing elements).

Below this is a card with a multiple line graph depicting average Completeness Over Time. This graph defaults to show completeness of all the elements selected by the Completeness Elements filter. A key at the bottom of the graph shows what each of the various lines represent (Figure 30).

Notice that this key shows the default (Priority 1 group listed in Table 5) list of elements checked for Completeness. You can customize this list in the Selected Filter module on the right in Figure 29.

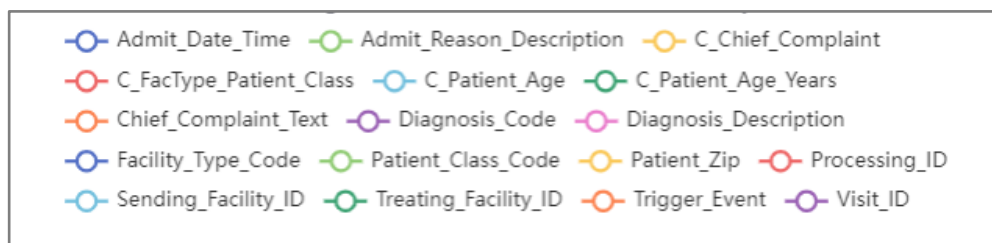


Figure 30. Key for “Completeness by Visit Over Time” Line Graph

Note: This key is also interactive, i.e., clicking on an element in the key will remove that element from the graph. A second click on the same element will return it to the graph.

Table 5 shows the default (Priority 1) data elements that are assessed for completeness. A data element that (1) follows its rule listed under *Completeness Definitions* AND (2) adheres to guidance referenced under *Location of Valid Values* is accepted as valid. These elements are listed in the Filter section where they can be tailored to better fit your site’s needs. Table 6, following, lists additional elements for further filtering.

Table 5. Default (Priority 1) Completeness Elements with Definitions and Location of Valid Values		
Data Element	Completeness Definitions	Location of Valid Values <i>Always refer to the current PHIN VADS* value list.</i>
Admit_Date_Time	Direct input from HL7 message PV1-44.1. Format: YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]]][+/-ZZZZ]	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Admit_Reason_Description	Direct input from HL7 message: PV2-3.2 and PV2-3.5. Select first non-null value and concatenate if repeating.	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
C_Chief_Complaint	Considered valid if value in its entirety is not found in the Non-informative Chief Complaint (NICC) terms list.	Data Dictionary in Nssp Technical Resource Center – Nssp Data Dictionary (NICC Tab)
C_FacType_Patient_Class	Considered valid if value exists in PHIN VADS value list	Valid values include E, I, and O and are inferred using Facility_Type_Code
C_Patient_Age	Considered valid if value is numeric and less than 120	Select the first non-null value from: <ul style="list-style-type: none"> ▪ C_Visit_Date – Birth_Date ▪ Age_Reported ▪ Age_Calculated
C_Patient_Age_Years	Considered valid if value is numeric and less than 120	Inferred using C_Patient_Age and C_Patient_Age_Source
Chief_Complaint_Text	OBX-5 segments where: OBX-3 Observation Identifier is 8661-1 and/or 11292-0 and OBX-2 = "TX" or "CWE" or "CW" Select all non-null values and concatenate: IF OBX-2="TX" then Chief_Complaint_Text = OBX-5.1. IF OBX-2="CWE" or "CW" then Chief_Complaint_Text = concatenate (OBX-5.9, OBX-5.2, OBX-5.5).	The CWE Chief Complaint type is a legacy format of Chief Complaint. It is being included to capture legacy data feeds. The TX Chief Complaint is from PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Diagnosis_Code	Direct input from HL7 message. DG1-3.1, DG1-3.4.	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)

Table 5. Default (Priority 1) Completeness Elements with Definitions and Location of Valid Values

Data Element	Completeness Definitions	Location of Valid Values <i>Always refer to the current PHIN VADS* value list.</i>
	Select first non-null value and concatenate if repeating. (Note: semicolon is placed in first character to facilitate searches)	
Diagnosis_Description	Direct input from HL7 message: DG1-3.2, DG1-3.5 Select first non-null value and concatenate if repeating	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Facility_Type_Code	Considered valid if value exists in PHIN VADS value list	PHVS FacilityVisitType SyndromicSurveillance
Patient_Class_Code	Considered valid if value exists in PHIN VADS value list	PHVS PatientClass SyndromicSurveillance
Patient_Zip	Direct input from HL7 message PID-11.5. Considered valid if formatted as ##### or #####-####	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Processing_ID	Value that defines whether the message is part of a production, training, or debugging system	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Sending_Facility_ID	Direct Input from HL7 Message: MSH-4.2 or MSH-4.1 Select the first non-null value	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Treating_Facility_ID	Direct input from HL7 message EVN-7.2	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Trigger_Event	Considered valid if value exists in PHIN VADS value list	PHVS EventType SyndromicSurveillance
Visit_ID	Direct input from HL7 message PV1-19.1	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)

* [PHIN VADS](#): Public Health Information Network Vocabulary Access and Distribution System

Table 6 lists the additional elements that can be used to filter data when evaluating Completeness.

Table 6. Additional Completeness Elements with Definitions and Location of Valid Values		
Data Element	Completeness Definitions	Location of Valid Values / Processing_Rational <i>Always refer to the current PHIN VADS* value list.</i>
Administrative_Sex	(F)emale, (M)ale, (O)ther, (U)nknown	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Admit_Reason_Code	Direct input from HL7 message: PV2-3.1 or PV2-3.4. Select first non-null value	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Age_Reported	Age >= 2 years – Truncate to whole years. Age < 2 years – Truncate to whole months.	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Age_Units_Reported	d - day, wk - week, mo - month, a - year, UNK - UNKnown	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
C_Patient_Age_Units	Considered valid if value exists in PHIN VADS value list	
C_Patient_County	Return the first non-null value from: PID-11.9 or PID-12.1	PID-12 is a legacy value still sent by some Sites; consequently, this value will continue to be captured for completion. 2) While PID-11 can repeat, the first occurrence is most important. PHVS_AgeUnit_SyndromicSurveillance
Combined_CCDD	Zero (0) if C_Chief_Complaint or Discharge_Combo is blank or null One (1) if both are not null or blank	Calculated value: If either C_Chief_Complaint or Discharge_Combo is not populated (NULL), then Combined_CCDD will be 0 otherwise one (1)
DDInformative	Zero (0) – Not Informative	Populated in Cache_ER_Base. Indicator value if Discharge Diagnosis is informative based on the Non-informative Chief Complaint (NICC) terms.
Diagnosis_Type	Considered valid if all values received within that message exist in PHIN VADS value list	PHVS_DiagnosisType_HL7_2x
Discharge_Date_Time	Direct input from HL7 message PV1-45.1	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Discharge_Disposition	Considered valid if value exists in PHIN VADS value list	PHVS_DischargeDisposition_HL7_2x
Ethnicity_Code	Considered valid if all values received within that message exist in PHIN VADS value list	PHVS_EthnicityGroup_CDC
Ethnicity_Description	Direct input from HL7 message: PID-22.2, PID-22.5: Select first non-null value and concatenate if repeating.	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
First_Patient_ID	Direct input from HL7 message PID-3.1. Select the FIRST non-null	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)

Table 6. Additional Completeness Elements with Definitions and Location of Valid Values

Data Element	Completeness Definitions	Location of Valid Values / Processing_Rational <i>Always refer to the current PHIN VADS* value list.</i>
	value in the PID-3 segment regardless of the Type (PID-3.5)	
HasBeenAdmitted	Set to Yes if the visit is flagged with HasBeenInpatient = Yes OR contains a discharge disposition value indicating an Admission. See the Discharge Disposition tab for more information.	Sheet: ESSENCE, ID: 276
Height	OBX-5.1 segment where: OBX-3 = "8302-2" Body Height (LOINC) or OBX-2 = "NM." Note: If the Height measurement reported does not "fit" into the decimal(6,2) datatype, the measurement will not be stored in Height. The string value of the measurement will still be stored in Str_Height.	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Insurance_Coverage	Direct input from HL7 message IN1-15	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Medical_Record_Number	Direct input from HL7 message, select the FIRST non-null PID-3.1 value WHERE PID-3.5 = "MR" (Medical Record Number)	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Patient_City	Direct input from HL7 message PID-11.3	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Patient_Country	Direct input from HL7 message PID-11.6	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Patient_State	Direct input from HL7 message PID-11.4	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Procedure_Code	Direct input from HL7 message: PR1-3.1, PR1-3.4. Select first non-null value and concatenate if repeating	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)

Table 6. Additional Completeness Elements with Definitions and Location of Valid Values

Data Element	Completeness Definitions	Location of Valid Values / Processing_Rational <i>Always refer to the current PHIN VADS* value list.</i>
Procedure_Combo	Store Procedure_Code and Procedure_Description in this field, accounting for null values. For Repeating Codes store the values using the following methodology: Code Description;Code Description;... Note the space between Code and Description	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Race_Code	Direct input from HL7 message: PID-10.1, PID-10.4. Select first non-null value from segments PID-10.1, PID-10.4 and concatenate if repeating.	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Race_Description	Direct input from HL7 message: PID-10.2, PID-10.5. Select first non-null value from segments PID-10.2, PID-10.5 and concatenate if repeating	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Recorded_Date_Time	Direct input from HL7 message EVN-2.1	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Sending_Facility_ID_Source	Return the source of the Sending_FacilityID value. Valid values: MSH-4.2 or MSH-4.1	Record which component was selected between MSH-4.2 and MSH-4.1 in Sending_FacilityID.
Smoking_Status_Code	OBX-5.1, OBX-5.4 segment where: OBX-3 = "72166-2" Tobacco Smoking Status (LOINC) or OBX-2 = "CWE" Select first non-null value and concatenate if repeating	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Travel_History	OBX-5.1 segment where: OBX-3 = "10182-4" History of Travel Narrative (LOINC) concatenate if repeating. OBX-5.1 is used regardless of OBX-2 value	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Triage_Notes	Entire OBX segment where: OBX-3 Observation Identifier 54094-8 Emergency Department Triage Notes or	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)

Table 6. Additional Completeness Elements with Definitions and Location of Valid Values		
Data Element	Completeness Definitions	Location of Valid Values / Processing_Rational <i>Always refer to the current PHIN VADS* value list.</i>
	OBX-2="TX" Populate this field with the OBX-5.1 segment; concatenate repeating segments	
Version_ID	Direct input from HL7 message MSH-12.1	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Weight	OBX-5.1 segment where: OBX-3 = "3141-9" Body Weight Measured (LOINC) or OBX-2 = "NM" Note: If the Weight measurement reported does not "fit" into the decimal(6,2) datatype, the measurement will not be stored in Weight. The string value of the measurement will still be stored in Str_Weight.	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)

* [PHIN VADS](#): Public Health Information Network Vocabulary Access and Distribution System

9.3.1 Stratification and Faceting of Completeness Visualizations

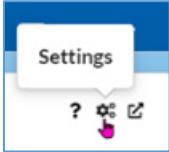
Both stratification and faceting are different visualization methods for grouped data. Either one may depict grouped data, whereas the use of both approaches allows data to be grouped twice (i.e., using two different variables).

Stratification or Group By is defined as the aesthetic mapping of grouped variable data as either a color-coded timeseries or y-axis variable. The default value for Group By is "Element."


Faceting is defined as the subdividing of grouped variable data into individual "facets," also known as "small multiples" or "trellis graphics." The plots collectively represent all underlying data, but each individual subplot depicts only one group in a variable. Default value for Facet By is "None."

In the upper right-hand corner of the Completeness by Visit Over Time and Completeness by Visit cards, there is the Settings icon.

Here is an expanded view showing this new icon (seen in the center)





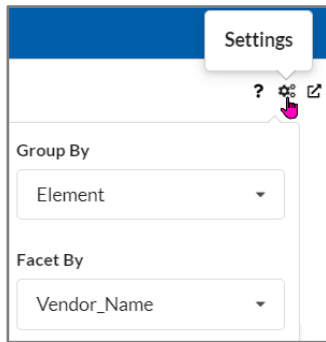
and it can also be seen in Figure 29 above.


When you click the Settings  icon on the Completeness by Visit Over Time card, you can select an option to group by. Options are Element (default), Feed_Name, Facility_Name, Parent_Organization, Vendor_Name, or Facility_Type.

To the right of the Average ED Completeness by Visit and Completeness by Visit Over Time in Figure 29 is the Completeness by Visit horizontal bar graph that provides another representation of Completeness. This displays the same elements as the multiple line graph in Completeness Over Time but sorted by percentage complete in descending order.

On the Completeness by Visit, you can choose to group and facet data.

We explained the other two icons   earlier in Section [2.1 Overview Page](#).



The new Settings icon , pointed to in the center in Figure 31, pulls up a Settings menu when you click on it. This allows you to:

- Group By Element (default), Feed_Name, Facility_Name, Parent_Organization, Vendor_Name, or Facility_Type, and
- Facet By None (default), Element, Feed_Name, Facility_Name, Parent_Organization, Vendor_Name, or Facility_Type.

Note: Some graphs only allow Group By.

Figure 31. Settings Icon for Group by or Facet by Settings



Be aware that Stratification and Faceting can be selected specifically for the individual graphs and for the expanded view of graph and table. Selecting these on the main grid card does not automatically select the same grouping and faceting on the expanded graph and table popup.

On the Completeness page, both the Completeness by Visit Over Time and the Completeness by Visit graphs may be customized by use of this Settings menu.

9.4 Validity

When you click **Validity** link in the Navigator Menu, the Validity page is displayed with three grid cards or sections (Figure 32). This is similar to the **Completeness** page. On the upper left, the Average ED Validity by Visit is displayed as a percentage of valid HL7 messages (no missing elements) based on the filters selected. This percentage is displayed in large font and rounded to two decimal places. (**Note:** If second decimal is zero, only one decimal place is shown.)

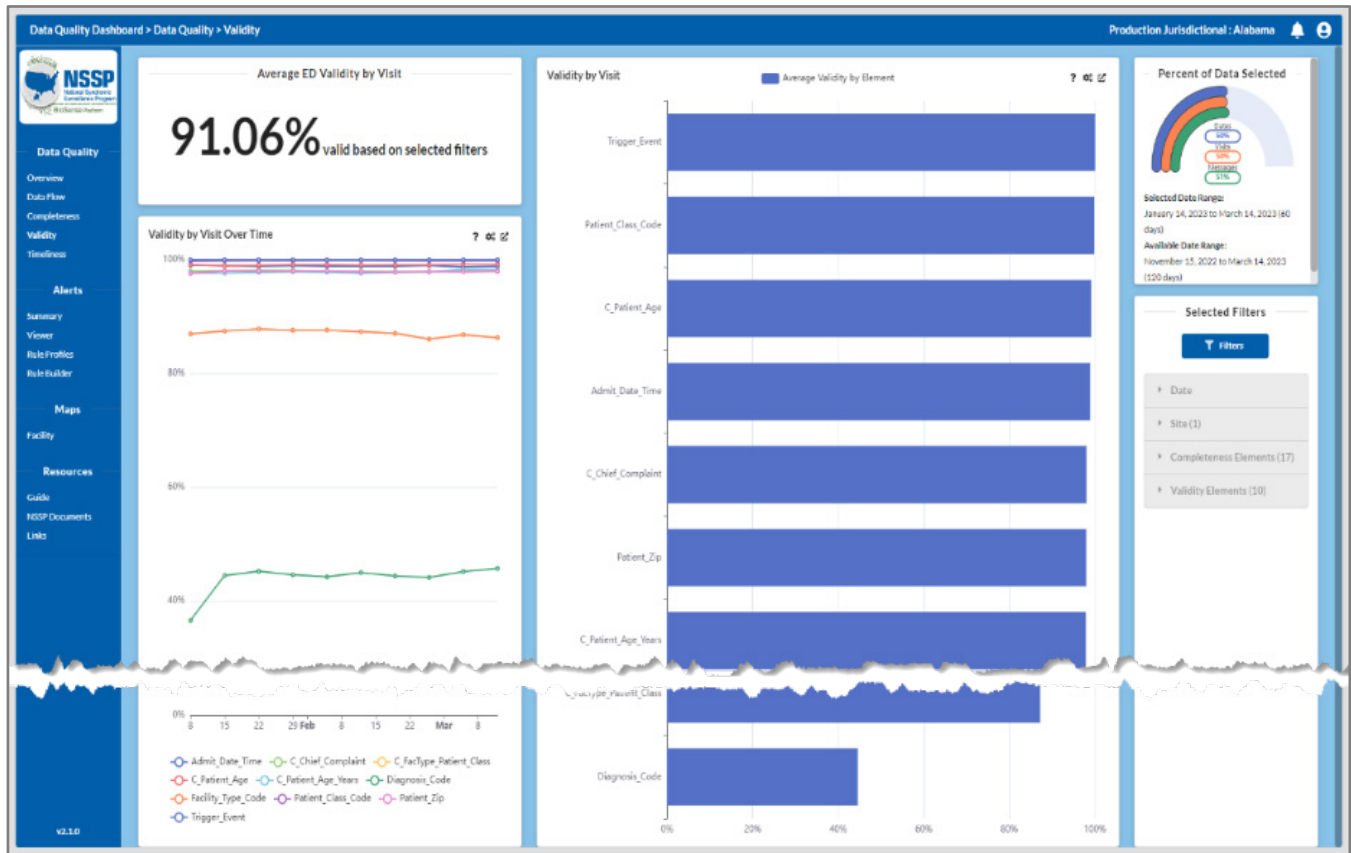


Figure 32. Validity Page Selected from Navigator Menu

Average ED Validity by Visit percentage is derived by calculating the proportion of valid messages. That is, by counting all filtered messages that were valid with no missing elements and dividing by the total number of messages sent, including those messages with missing elements, and met filter criteria.


Below, the Average ED Validity by Visit grid card is a card with a multiple line graph depicting average Validity Over Time. This graph defaults to show validity of all the elements selected by the Validity Elements filters. A key at the bottom of the graph shows what each of the various lines represent (Figure 33).



Figure 33. Key for “Validity Over Time” Line Graph

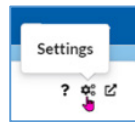
Note: This key is also interactive, i.e., clicking on an element in the key will remove that element’s line from the graph. A second click on the same element will return it to the graph.




[Table 7](#) shows the default list of elements checked for validity. These are the Priority 1 elements. This can be changed by customizing the list in the Filter Selection module as seen on the right side of Figure 31.

By clicking on the Settings icon  in the upper right (Priority 1 elements), you can change the Group By function from the default, “Element,” to other available choices, such as Feed_Name, Facility_Name, Parent_Organization, Vendor_Name, or Facility_Type. Faceting is not available in the Validity Over Time grid card.

To the right of the Average ED Validity by Visit and Validity by Visit Over Time in Figure 31 is a horizontal bar graph that provides another representation of validity, Validity by Visit. By default, this displays the same elements as the multiple line graph, Validity by Visit Over Time, sorted by percentage Valid in descending order.

Also, in the upper right-hand corner of the Validity Over Time and Validity by Visit grid cards there is the Settings icon.



An enlarged view of these icons    is shown here with the Settings icon pointed to.

The “Validity Over Time” Settings icon pops up a Group By selector so you may choose how you want to see your visualizations. The selections are Element, Feed_Name, Facility_Name. Parent_Organization, Vendor_Name, and Facility_Type.

The “Validity by Visit” Setting icon has a Facet By selector in addition to the Group By selector. The default value of the Facet By setting is None. Other choices are Element, Feed_Name, Facility_Name. Parent_Organization, Vendor_Name, and Facility_Type.

Table 7 shows the default (Priority 1) data elements that are assessed for validity. A data element that (1) follows its rule listed under *Validity Definitions* AND (2) adheres to guidance referenced under *Location of Valid Values* is accepted as valid. These elements are listed in the Filter section where they can be tailored to better fit your site’s needs. Table 8 lists additional elements for further filtering.

Table 7. Default (Priority 1) Validity Elements with Definitions and Location of Valid Values		
Data Element	Validity Definitions	Location of Valid Values <i>Always refer to the current PHIN VADS* value list.</i>
Admin_Date_Time	Direct input from HL7 message PV1-44.1	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
C_Chief_Complaint	Considered valid if value in its entirety is not found in the Non-informative Chief Complaint (NICC) terms list	Data Dictionary in NSSP Technical Resource Center – NICC tab. NSSP Data Dictionary (NICC Tab)
C_FacType_Patient_Class	Considered valid if value exists in PHIN VADS value list	Valid values include E, I, and O and are inferred using Facility_Type_Code
C_Patient_Age	Considered valid if value is numeric and less than 120	Select the first non-null value from: <ul style="list-style-type: none"> ▪ C_Visit_Date – Birth_Date ▪ Age_Reported ▪ Age_Calculated
C_Patient_Age_Years	Considered valid if value is numeric and less than 120	Inferred using C_Patient_Age and C_Patient_Age_Source
Diagnosis_Code	Considered valid if the value in its entirety is not found in the Non-Informative Chief Complaint (NICC) terms list	Data Dictionary in NSSP Technical Resource Center
Facility_Type_Code	Considered valid if value exists in PHIN VADS value list	PHVS FacilityVisitType SyndromicSurveillance
Patient_Class_Code	Considered valid if value exists in PHIN VADS value list	PHVS PatientClass SyndromicSurveillance
Patient_Zip	Direct input from HL7 message PID-11.5. Considered valid if formatted as ##### or #####-####	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Trigger_Event	Considered valid if value exists in PHIN VADS value list	PHVS EventType SyndromicSurveillance

* [PHIN VADS](#): Public Health Information Network Vocabulary Access and Distribution System

Table 8 lists the additional elements that can be used to filter data to evaluate validity.

Table 8. Additional Validity Elements with Definitions and Location of Valid Values		
Data Element	Validity Definitions	Location of Valid Values <i>Always refer to the current PHIN VADS* value list.</i>
Administrative_Sex	(F)emale, (M)ale, (O)ther, (U)nknown	PHVS_Gender_SyndromicSurveillance
Age_Reported	Age >= 2 years – Truncate to whole years. Age < 2 years – Truncate to whole months.	PHIN Messaging Guide for Syndromic Surveillance Release 2
Age_Units_reported	d – day, wk – week, mo – month, a – year, UNK – UNKnown	PHVS_AgeUnit_SyndromicSurveillance
C_Patient_Age_Units	Considered valid if value exists in PHIN VADS value list	PHVS_AgeUnit_SyndromicSurveillance
Ethnicity_Code	Considered valid if all values received within that message exist in PHIN VADS value list	PHVS_EthnicityGroup_CDC
Diagnosis_Type	Considered valid if all values received within that message exist in PHIN VADS value list	PHVS_DiagnosisType_HL7_2x
Discharge_Disposition	Considered valid if value exists in PHIN VADS value list	PHVS_DischargeDisposition_HL7_2x
Ethnicity_Code	Considered valid if all values received within that message exist in PHIN VADS value list	PHVS_EthnicityGroup_CDC
Height	OBX-5.1 segment where: OBX-3 = “8302-2” Body Height (LOINC) or OBX-2 = “NM.” Note: If the Height measurement reported does not “fit” into the decimal(6,2) datatype, the measurement will not be stored in Height. The string value of the measurement will still be stored in Str_Height.	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Insurance_Coverage	Direct input from HL7 message IN1-15	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Race_Code	Considered valid if all values received within that message exist in PHIN VADS value list	PHVS_RaceCategory_CDC
Smoking_Status_Code	OBX-5.1, OBX-5.4 segment where: OBX-3 = “72166-2” Tobacco Smoking Status (LOINC) or OBX-2 = “CWE” Select first non-null value and concatenate if repeating.	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)
Weight	OBX-5.1 segment where: OBX-3 = “3141-9” Body Weight Measured (LOINC) or OBX-2 = “NM” Note: If the Weight measurement reported does not “fit” into the decimal (6,2) datatype, the measurement will not be stored in Weight. The string value of the measurement will still be stored in Str_Weight.	PHIN Messaging Guide for Syndromic Surveillance Release 2 (April 2015)

* [PHIN VADS](#): Public Health Information Network Vocabulary Access and Distribution System

You may view visualizations for specified groupings of data elements by selecting the Settings icon and Group By grouping component. By default, “Group By Element” will be displayed. The data groupings include:

- Element
- Feed_Name
- Facility_Name
- Parent_Organization
- Vendor_Name
- Facility_Type
- *Use groups* (elements grouped into related categories) including Facility, Visit, Chief Complaint (CC) and Diagnosis, Patient Demographics, and Data Processing data elements. Individual elements may also be chosen.

Data Refresh: The Validity graphics are updated daily at 04:00:00 UTC, and the data in the underlying calculations are refreshed daily at 00:00:00 UTC. Underlying calculation data include the previous 120 days of data (based on c_visit_date).

9.5 Timeliness

The Timeliness Page provides an overview of your site’s data timeliness. Timeliness is calculated as the difference in time between the first message received (adjusted for time zone) for a given visit and the C_Visit_Date of that message.

When you click on the Timeliness link in the Navigator Menu, the Timeliness page is displayed with three grid cards or sections (Figure 34). On the upper left, the Average Timeliness from Visit to First Message Received is displayed as hours based on the filters selected. Hours are displayed in large font, rounded to two decimal places. If the second decimal place is zero, only the significant digits are displayed.

The Average Timelines is derived using visit-level data (adjusted for time zone) for the datetime of the first visit message minus the datetime of the initial patient visit (“C_Visit_Date”). To state it another way, the difference between the timestamp for the first message reporting the visit and the time reported for the visit is calculated for each visit reported in the filtered messages processed and averaged for your site over the time interval specified by the Date filter (usually 60 or 120 days).

In Figure 34, the Settings for Group By were set to Facility_Type. This figure provides an example of the Timeliness page as well as the Group By functionality.

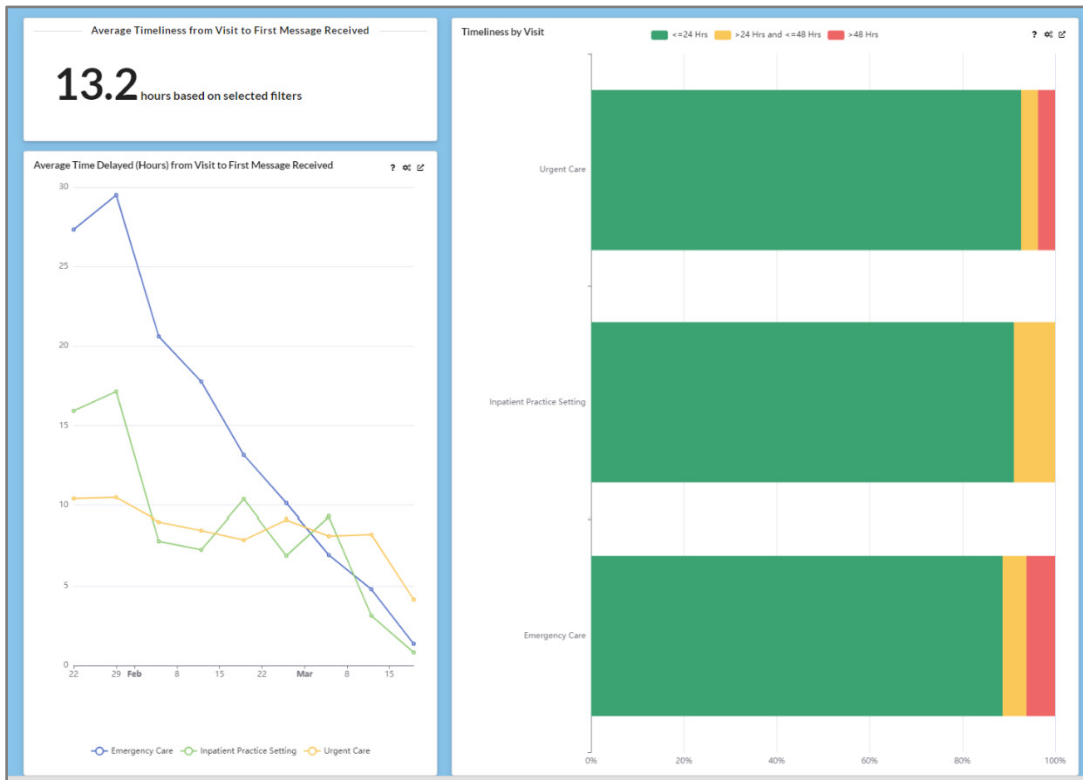


Figure 34. Timeliness Page Grouped By Facility_Type

The results of using the Group By Facility_Type are illustrated in Figure 34.

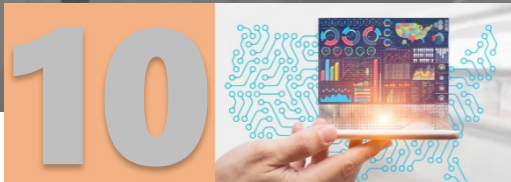
- The Average Time Delayed (Hours) from Visit to First Message Received is shown in the 3-line graphic representing Emergency Care, Inpatient Practice Setting, and Urgent Care.
- The Timeliness by Visit horizontal bar graph is also grouped by Facility_Type and displays the same three types: Emergency Care, Inpatient Practice Setting, and Urgent Care as the Average Time Delayed (Hours) from Visit to First Message Received visualization noted above.

The key to the Average Time Delayed (Hours) from Visit to First Message Received graph is below (Figure 35).



Figure 35. Key to Average Timeliness from Visit to First Message Received

As with other keys, these are interactive. By clicking on them, you can remove and reactivate individual Facility_Types.



Alerts

The Alerts section features enhanced rules and alerts functionality. *Rules* provide the ability to tell the DQ Dashboard which message details you want to track. This is done by setting up detailed rule parameters, then when a defined parameter is breached, an alert is generated. DQ Dashboard *Enhanced Alerting* includes a new Alert Summary, an Alert Viewer, a Rule Viewer for rule management, and a Rule Builder with an on-demand method results preview.

Here are the rule and alert features:

- A new Summary page displays an overview of all rules the user has created and compares the alert count for all rules as a visual, allowing comparison and the ability to draw inferences at a high level.
- The Viewer page shows rule alerts at a more detailed level, displaying visualization of alerts over time to assist in alert trend identification. The ability to view alerts and save comments will enhance discussion and collaboration for alert triage.
- The Rule Profiles page allows the user to inspect rule parameter details. Rule may be toggled between Active/Inactive. Additionally, an existing rule's parameters can be used as a template to create new rules on the Rule Builder page. This will save time filling detailed fields and can be useful where slight alterations in rule parameters are desired. Rules can be deleted when no longer useful.
- The Rule Profiles page also provides for the inspect rule parameter details by expanding rule records to expose both basic and advanced parameters.
- Rule management is similar to those available on the Rule Profile page. This includes the ability to toggle a rule's status between Active/Inactive, to use an existing rule's parameters as a template to create new rules, and to delete rules that are no longer useful.
- The ESSENCE-processed DDInformative and HasBeenAdmitted values have been added to DQ Dashboard Completeness elements.

10.1 Summary

The Summary link on the Navigator Menu displays the Rules & Alerts Overview table at the top and Summary Graphics below.

Upon opening the Summary page, the list of rules with data quality metric, status, number of alerts, and other information is displayed at the top (Figure 36). The Rule & Alerts Overview table in the upper section of the Data Quality Dashboard > Alerts > Summary page has nine columns. They are listed in Table 9:

Table 9. Columns in Rule & Alerts Table	
Column Name	Column Name
Rule Name	Total Alerts
DQMetric	Notification Window (days)
Status	Alerts in Window
Severity	Notifications
	Actions

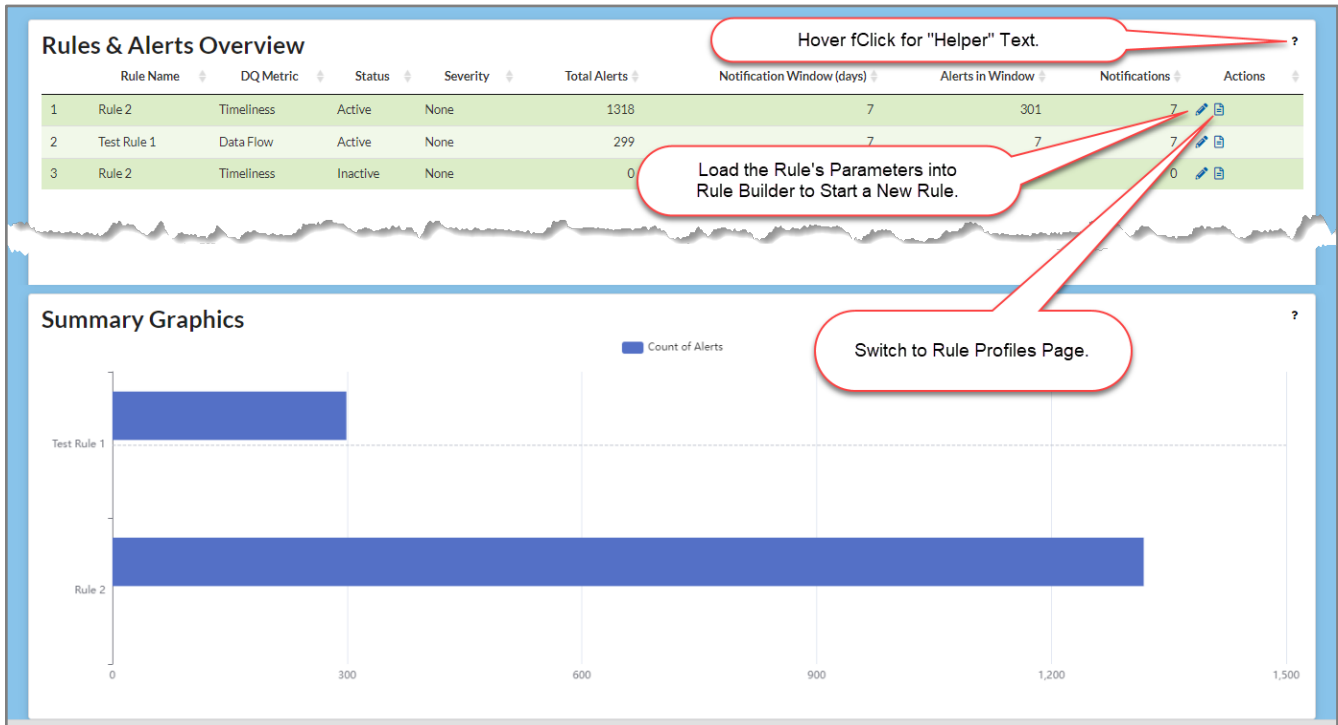


Figure 36. Data Quality Dashboard > Alerts > Summary (Overview and Graphics)—No Rule Selected

10.1.1 Summary—No Rule Selected

Below the Rules & Alerts Overview section is a graphics section named Summary Graphics. When no rule has been selected from the Rules & Alerts Overview table, the Summary Graphics section displays a horizontal bar chart with space for bars representing, at most, the top 5 rules based on the number of Total Alerts reported in the overview table shown in Figure 37.

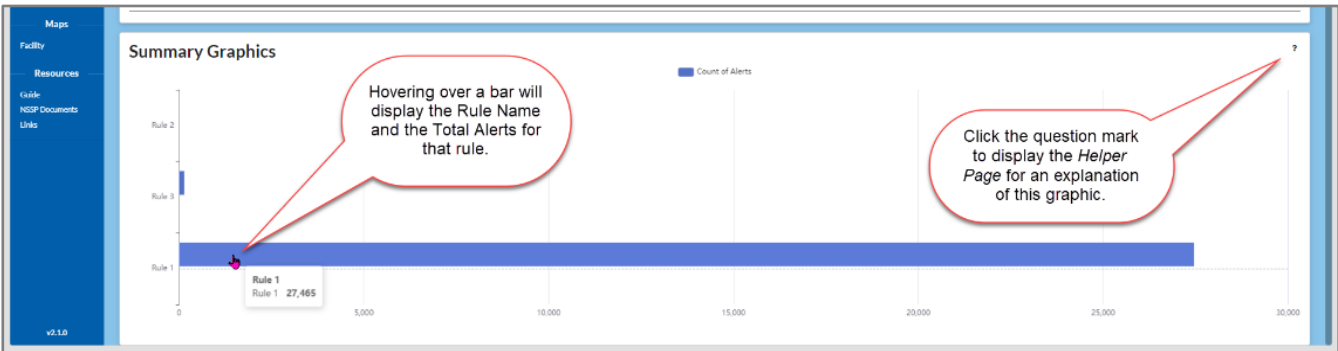


Figure 37. Data Quality Dashboard > Alerts > Summary Page—Summary Graphics

When you hover over the question mark (?) in the upper right-hand corner of either the Overview table or the Graphics visualization, a small popup message is displayed instructing you to click to view the *Helper Page*.

Clicking on the question mark (?) will display a *Helper Page* pop-up which provides a detailed explanation of each panel.

10.1.2 Summary–Rule Selected

If you select a rule by clicking on it, the Summary Graph changes to a line graph depicting the number of alerts recorded per day (Figure 38).

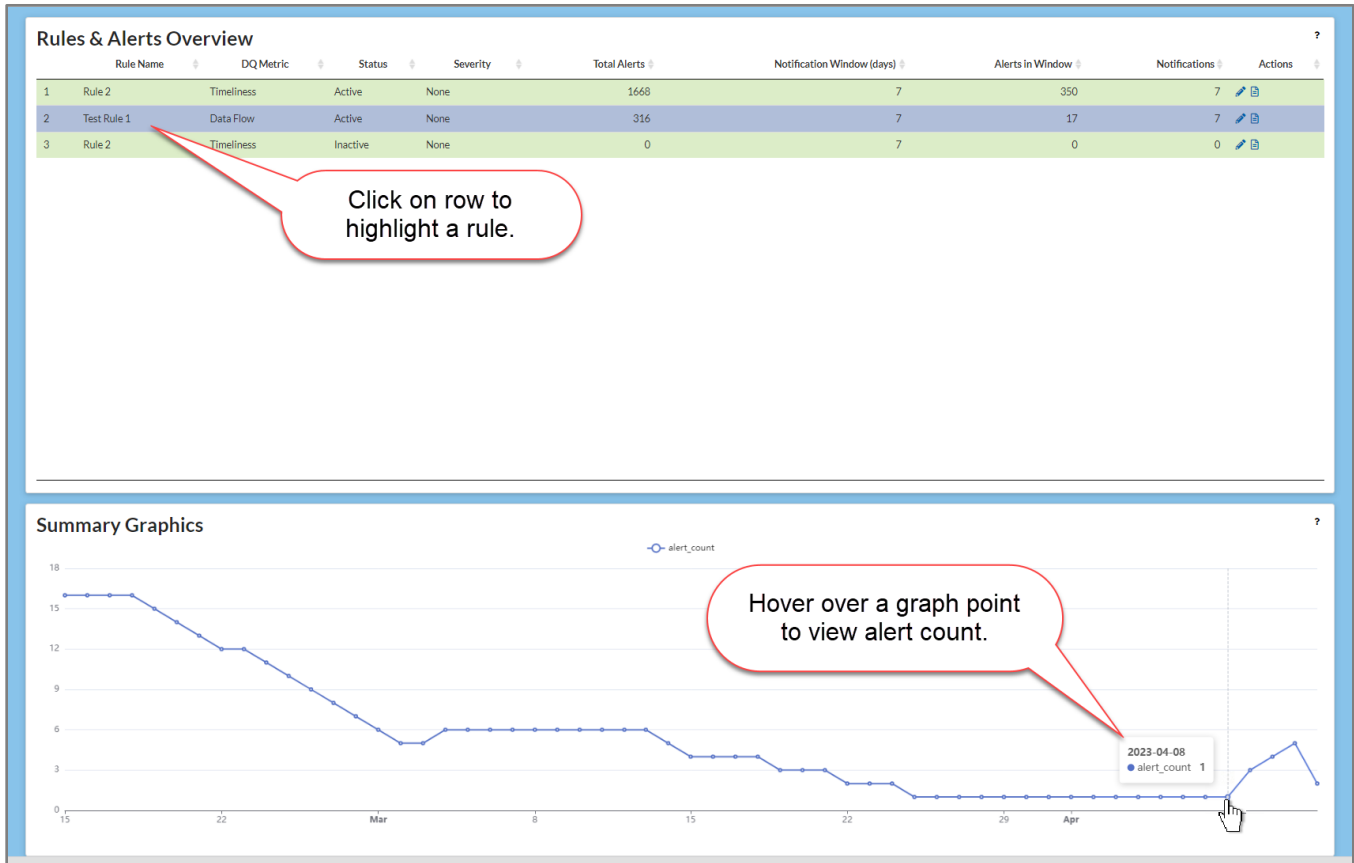


Figure 38. Summary with Rule Selected

Hovering over a day on the graph will pop up a display showing the number of alerts for that day.

10.2 Viewer

In the Viewer, the Alerts table displays alerts recorded since the last job (Jobs run daily.), but unlike the Alert Summary table, each alert is listed separately. At the right, there is a Comment pane. When a Figure 39 shows a screenshot of the Alerts table. The Alert *Helper Text*, displayed by clicking on the question mark (?) in the upper right, defines what each column represents. Brief definitions are listed in Table 10 for convenience.

Table 10. Names and Descriptions of Columns in the Alerts Table	
Column Name	Description
Alert Job Datetime	Date and times when the alert detection job ran.
Rule Name	Name of the rule
DQ Metric	The data quality metric where the alert was detected.
Severity	Degree of subjective importance as selected by the user creating the rule.
Grouping Variable	The variable used to perform grouping calculations, e.g., Facility_Name.
Date	Date when the alert was triggered.
Threshold	The numeric limit which triggered the detected anomaly.
Detector	Method of alert detection.

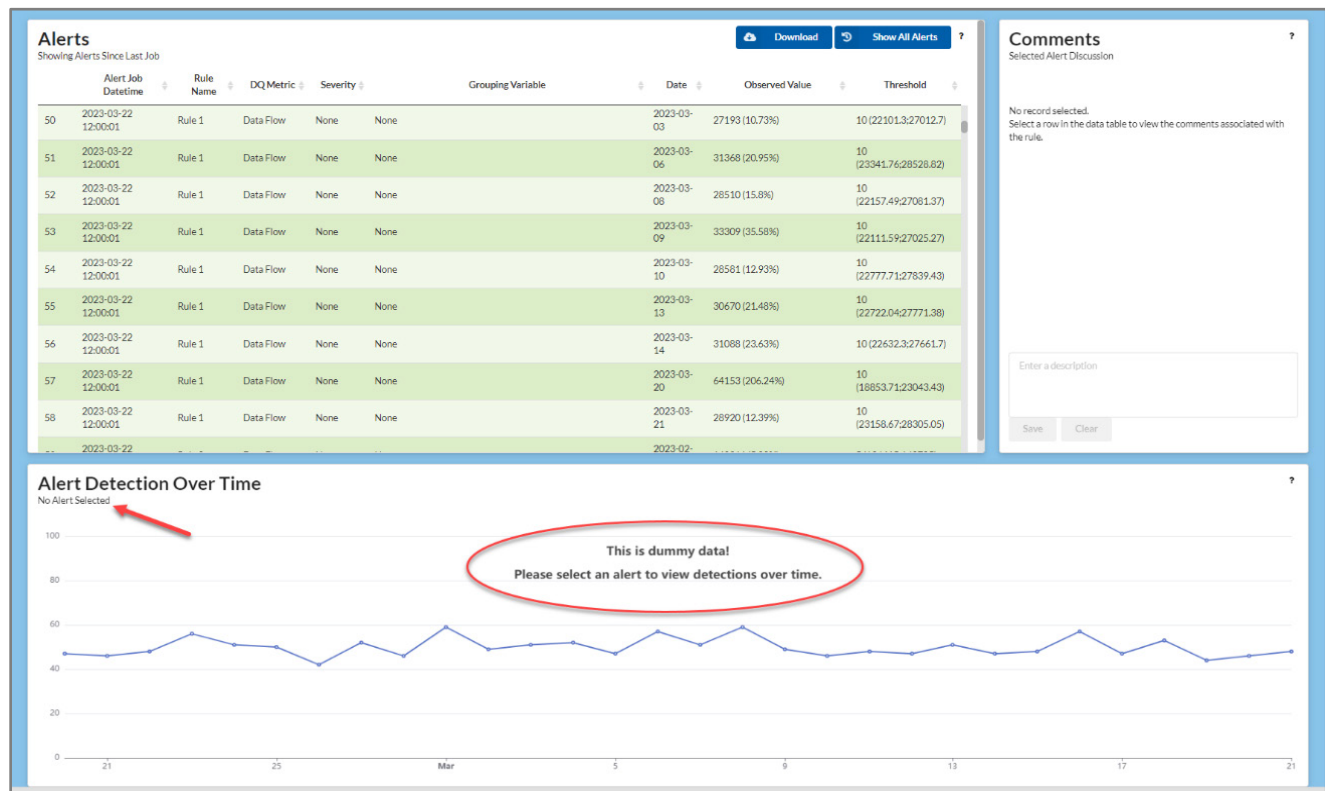


Figure 39. Alerts Table Showing Alerts from the Last Detection Job—No Alert Selected

10.2.1 Alerts—No Alert Selected

Notice that the Comments section states that “No record selected.” And the Alert Detection OverTime has a red arrow pointing to a note saying, “No Alert Selected.” In addition (circled in red), it states that “This is dummy data! Please select an alert to view detections over time.”

However, if you hover over any alert (between the Alert Job Datetime and Grouping Variable column, a pop-up will show the Rule Name, Author, Creation Date, Detection Method, and any Group by information

10.2.2 Alerts—Alert Selected

When you highlight a rule, additional information is displayed. Comments previously saved for the specific Rule Name will be displayed on the right in the Comments area and in the Alert Detection Over Time panel (at the bottom). Your data will be graphed using the rule’s parameters (Figure 40).

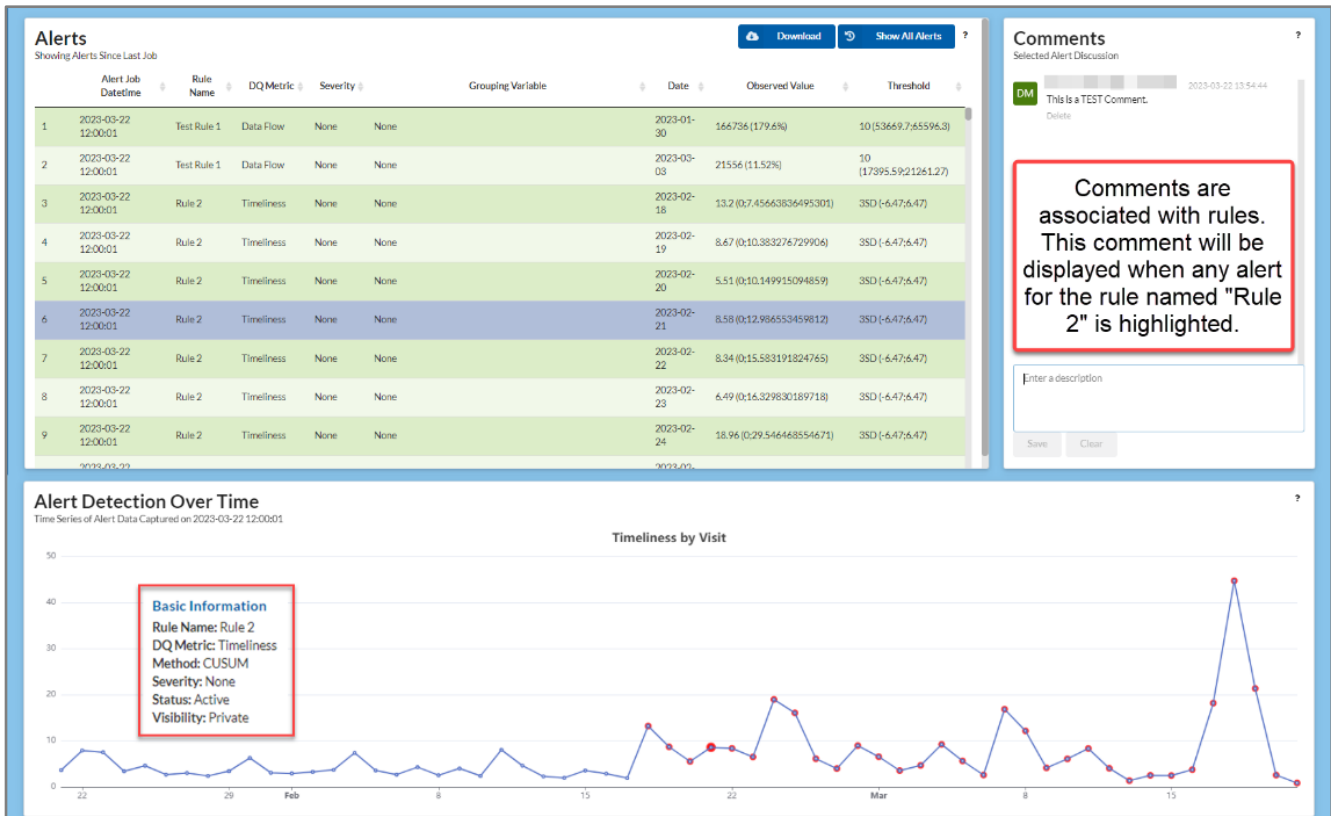


Figure 40. Alert Viewer—Rule Selected—Comments and Rule Visualized with Current Data

10.3 Rule Profiles

The Rule Profiles page displays your rules in table form. There is a rotating expander (>) near the left of each row that will display each rule's details. The Rule Profiles page is displayed below (Figure 41) with a rule expanded to show the level of detail provided. At the right of each row are three icons that allow you to "Activate" or "Deactivate" the rule, edit a rule (open it in Rule Builder), or permanently delete the rule.

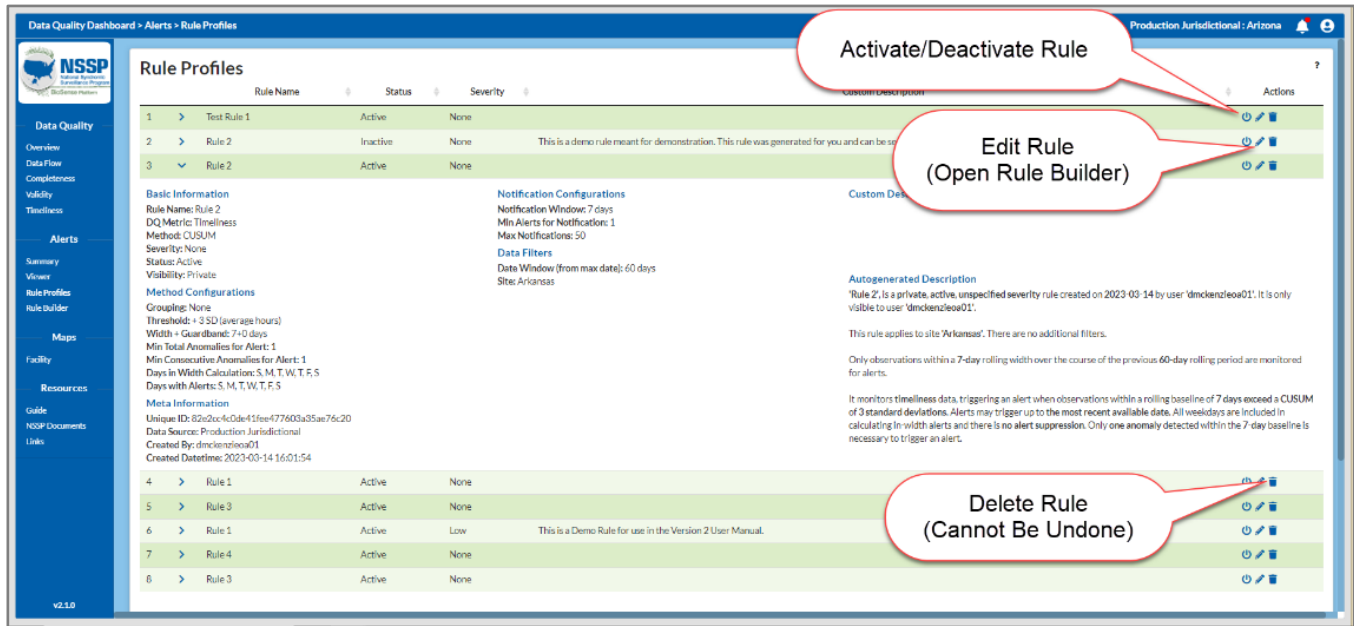


Figure 41. Rule Profile Page with Rule Expanded to Show Details

10.4 Rule Builder

The Rule Builder allows you to create new rules. Existing rules can be loaded into the builder to provide a template to create a rule similar to an existing one.

In addition, there a Filter button to select a custom filter set for individual rules, five sections for input and preview, plus an Autogenerated Description that provides an English text description of the rule's parameters.

10.4.1 Activity Buttons

There are three activity buttons:

- Load Rule: Loads parameters from an existing rule,
- Create Rule: Saves a rule to your rule set, and
- Discard Rule: Permanently deletes a selected rule.

Rule Builder sections for input include cards titled Basic Options, Method Options, and Notification Options.

10.4.2 Basic Options

Basic Options contain universal parameters that are not affected by the alert (DQMetric) method. This option contains the following fields:

10.4.2.1 Rule Name

This alphanumeric field can contain up to 200 characters, but only the first 50 characters are viewable.

10.4.2.2 DQMetric

These are the data quality metrics used to classify the data being analyzed. The following metrics are available:

- Data Flow
- Timeliness
- Completeness
- Validity

10.4.2.3 Grouping

You may select a variable to group your data by. For example, you could select Vendor Name, if you use multiple vendors, to consider how one vendor compares with others for Timeliness. The grouping selections include:

- None
- Site (Only Accessible to Super-Administrators)
- Facility Name
- Feed Name
- Vendor Name
- Parent Organization
- Facility Type
- HHS Region
- Data Element

10.4.2.4 *Alert Method*

There are four tools for assessing your data. Different methods require different options, and the Method Options will update to match your selected Alert Method. The alert options currently available are:

- CUSUM: Cumulative sum control for change detection,
- EWMA: Exponentially weighted moving average,
- Percent Change: Significant changes in proportions of message counts or existing percentages, and
- Value Limit: Numeric threshold to trigger alerts when crossed.

10.4.2.5 *Severity*

This is used to provide subjective weighting to alerts generated by a rule. Assignable levels of Severity are:

- None
- Low
- Medium
- High

10.4.2.6 *Custom Description*

This large free-text field provides space to create an individualized rule description outside the scope of the Autogenerated Description and is displayed in the Rule Profiles tab.

10.4.3 **Method Options**

The Method Options present Alert Method-specific options that are set up when populating the Basic Options panel. These parameters include Threshold, Directionality, Guardband, Width, Baseline Metric, Minimum Total, Minimum Consecutive, Days in Calculation, and Days with Alerts.

10.4.3.1 *Threshold*

An integer designating the limit, when reached, will trigger an alert.

10.4.3.2 *Directionality*

The direction—above, below, or both (either above or below)—the observed value that must be crossed to trigger an alert.

10.4.3.3 *Guardband*

The number of days after the system date to ignore observations for the purpose of anomaly detection. This is helpful in preventing false alerts due to lagging observations.

10.4.3.4 *Width*

The number of days to use in calculating moving averages.

10.4.3.5 *Baseline Metric*

This value is used with the Percent Change method.

10.4.3.6 *Minimum Total*

The minimum number of anomalies required within the rolling “Width” to trigger an alert.

10.4.3.7 *Minimum Consecutive*

The minimum number of consecutive anomalies required within the rolling “Width” to trigger an alert.

10.4.3.8 *Days in Calculation*

Seven checkboxes for days of the week to force inclusion in detection algorithm. Excluding one or more weekdays will make calculations behave as if observations are seamless day-over-day.

10.4.3.9 *Days with Alerts*

Seven checkboxes for days of the week to select days used in signaling alerts. Excluding one or more weekdays will still include them in calculations and anomaly detection (unless excluded by use of the “Days in Calculation” checkboxes). However, any alerts during these days will be suppressed.

10.4.4 Notification Options

The notification options are parameters for the minimum number of alerts required to generate a user notification and the maximum number of notifications that should be delivered.

10.4.4.1 *Notification Window from Max Date*

The rolling range of days during which alerts will trigger notifications.

10.4.4.2 *Minimum Alerts for Notification*

The total number of alerts within the “Notification Window from Max Date” range that are required to send a notification.

10.4.4.3 *Maximum Notifications in Window*

The total number of notifications that can be sent within the “Notification Window from Max Date” range.

10.4.5 Preview

This panel will apply your chosen option parameters to your last 60 days of data to generate a representative graph. When you click the **Refresh** button on the right to apply your rule to your data, a time-series visualization and interactive data table will be generated

Note: You must refresh this preview each time any parameters are changed.

10.4.6 Autogenerated Description

This description provides a plain language description of all parameters selected in the Basic and Method Options as well as the Notification Options you selected. The Rule Name will not be displayed but will be in the description displayed in the Rule Profile table.

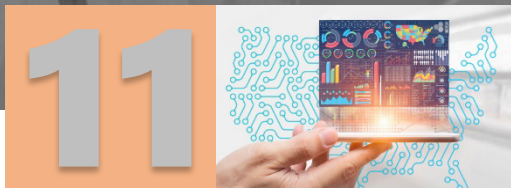
10.5 New Rule

When you first click on Rule Builder in the Navigation Menu, a new Rule Builder form is displayed (Figure 42). Most fields have default values but can be changed to fit your needs.

The screenshot displays the 'New Rule Builder' interface. The top navigation bar includes 'Data Quality Dashboard > Alerts > Rule Builder' and 'Production Jurisdictional: Alabama'. The left sidebar contains a navigation menu with 'Rule Builder' highlighted. The main content area is organized into several sections:

- Basic Options:** Includes fields for Rule Name, DQ Metric (Data Flow), Message Type (Processed), Grouping (None), Alert Method (Percent Change), Severity (None), and a Custom Description field.
- Method Options:** Includes fields for Threshold (10 percent of messages), Directionality (Above), Guardband (0 days from max date), Width (7 days in method baseline), Baseline Metric (Mean), Minimum Total (1 anomalies in width), Minimum Consecutive (1 anomalies in width), Days in Calculation (checkboxes for S, M, T, W, T, F, S), and Days with Alerts (checkboxes for S, M, T, W, T, F, S).
- Notification Options:** Includes Notification Window (7 days), Minimum Alerts (1 alerts), and Maximum Notifications (50 notifications).
- Autogenerated Description:** Provides a detailed explanation of the rule's logic and filtering criteria.
- Preview:** Features a line chart showing data trends. A red circle highlights the text: "This is dummy data! Press the 'Refresh' button to get started." Below the chart is a table with columns 'Date' and 'Value', and a message: "No data available in table".

Figure 42. New Rule Builder Page



Map View

The Maps > Facility page (Figure 43) displays a geographical representation of facilities registered in the MFT and their facility status values. The facility location in the map on the Map page corresponds to the latitude and longitude values entered in the MFT.

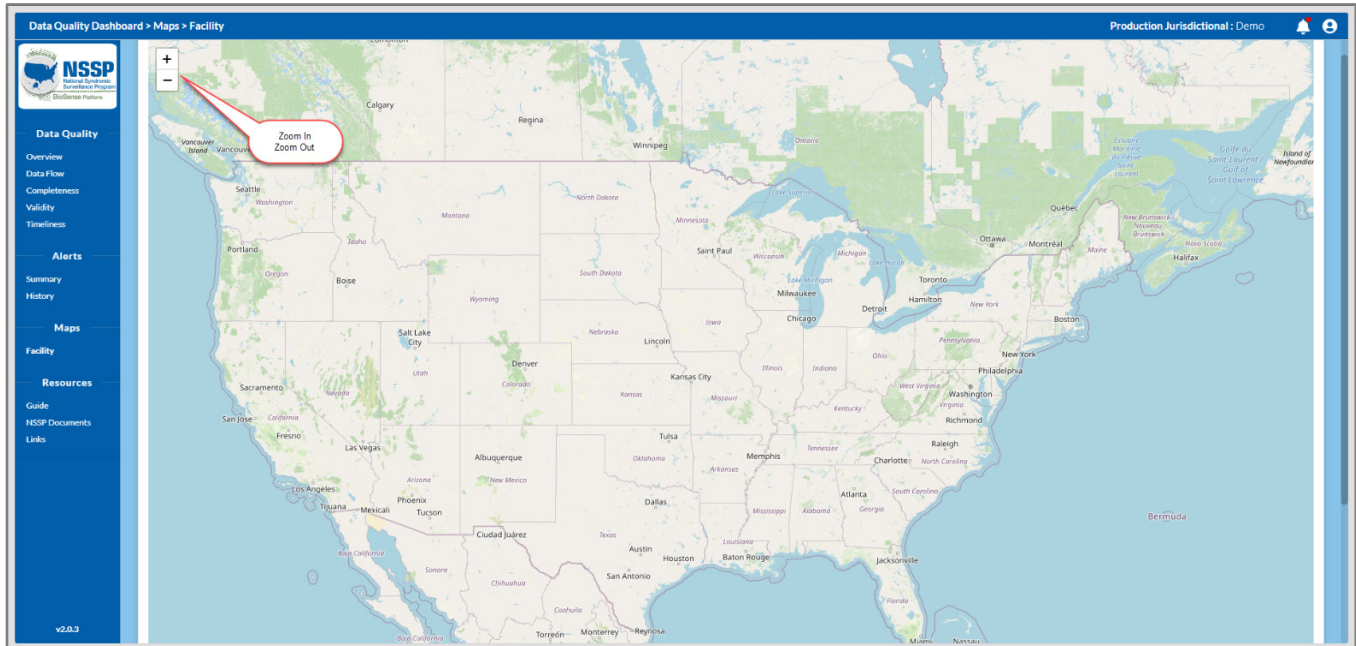


Figure 43. Typical Facility Map (without site specific data)

Due to privacy issues, a site-specific map cannot be displayed here. Highlights of a typical site’s facilities maps are described below.

11.1 Map Characteristics



Figure 44. Facility Locators

An OpenStreetMap© map, similar to Google Maps, is shown for the geographic area being viewed. Facility locators (Pins) may be individually shown or consolidated, depending on map scale (Figure 44).

This map scale can be decreased (zoomed in) or increased (zoomed out) by clicking on the plus (+) or minus (-) signs in the upper right-hand corner of the map. Zooming in can cause grouped facility icons to ungroup and reveal individual facility locations.

The map can be moved to view specific areas by holding the left mouse button down and dragging the map in the desired direction. **WARNING:** The + and – zoom buttons can be moved off your screen when dragging the map to the left.




If a facility in the MFT does **not** show on your facility map where expected, verify that the latitude and longitude values were correctly entered. Facility pins and group locator icons are displayed on your site map based on each facility's latitude and longitude values recorded in the

11.2 Facility Status Indicators

Facility Status is designated by color-coded icons (Figure 45). These icons denote status of individual facilities.

11.3 Viewing Facility Information

View individual facilities by zooming in or clicking on the numbered group or facility cluster icon such as:  Facilities that are still sufficiently close in geographic proximity will remain algorithmically clustered. Continue to zoom in to separate any remaining clustered facilities or until a facility pin of interest is displayed.



To access the Facility Information pop-up, first place your cursor on an icon (hover over it) to display the facility name.

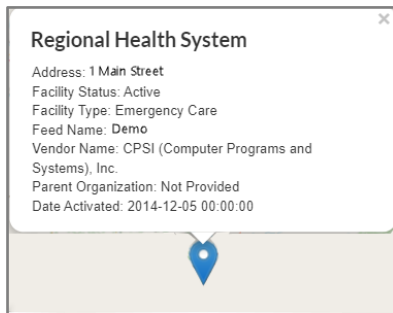


Figure 46. Facility Pin Pop-ups

If you click on the icon, a pop-up is displayed with additional facility information, such as Address, Status, Facility Type, and a small Visit Count graph is displayed in the upper-right corner of the page (Figure 46).

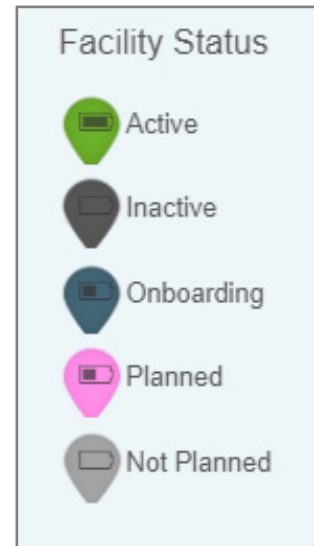
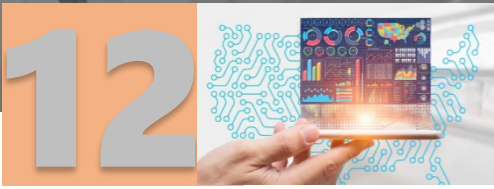


Figure 45. Facility Status Legend



Use of Filters

Default filters are initially set by the application. These defaults are for Date, Site, Completeness Elements, and Validity Elements. These filters drive the initial view of the dashboard.

These and other filters are available and can be added, changed, or removed to tailor the views to be of better use to you (Figure 47).

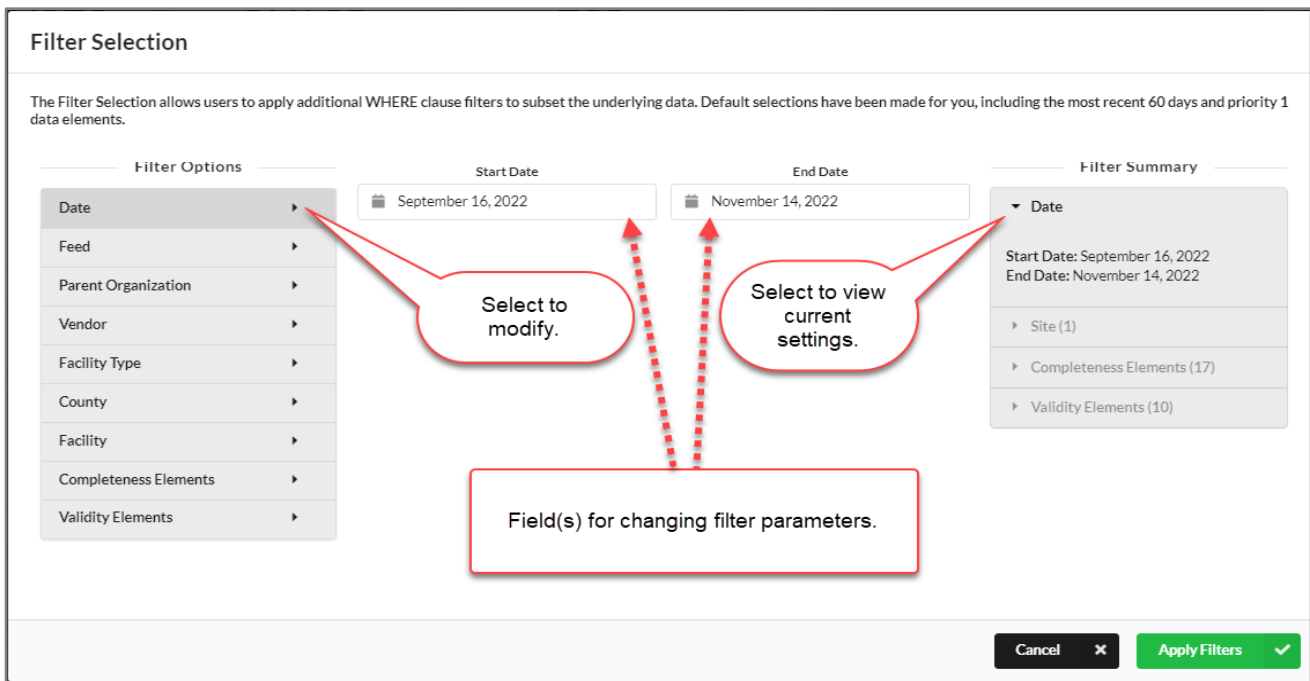


Figure 47. Displaying and Changing Filters

Table 11 shows the list of filters and their parameter types:

Table 11. Filters with Parameters	
Filter	Parameter Types
Date	Start / End Dates
Feed	Pick List
Parent Organization	Pick List
Vendor	Pick List
Facility Type	Pick List
County	Pick List
Facility	Pick List
Completeness Elements	Pick List
Validity Elements	Pick List

12.1 Date Filter

When you click on the Start Date or End Date field, a calendar will pop up. You can then select the date you want on the pop-up calendar. Typically, 120 days of data are available.

The default values for Date range follows:

- Start Date—Current Date minus 120 calendar days
- End Date—Current Date minus 1 calendar day

Future dates may not be entered.

12.2 Feed Filter

Sites may have one or more feeds. This filter allows the analyst to examine dataflow from a specific feed or group of feeds to help isolate problems that are feed related.

The default value for the Feed filter is *none selected*. Data from all feeds are included.

12.3 Parent Organization Filter

Parent organizations may have one or more facilities associated with them, and a site may have one or more Parent Organizations associated with it. This filter allows data to be restricted by parent organization(s). If parent organization was noted in the site's MFT, the Available Values pick list will show *Not Provided*.

The default value for the Parent Organization filter is *none selected*. All Parent Organizations are included.

12.4 Vendor Filter

Typically, sites deal with more than one data transport supplier. On occasion, a specific vendor could introduce errors across multiple feeds being serviced. The use of this filter could help in tracking an issue to its root cause.

The default value for the Vendor filter is *none selected*. All Vendors are included.

12.5 Facility Type Filter

Facility Type examples are Emergency Care, Inpatient Practice or Care, Urgent Care, or Primary Care. These would be grouped by their major function. Using this filter, the site administrator or analyst could isolate issues specific to certain kinds of facilities.

The default value for the Facility Type filter is *none selected*. All Facility Types included in the site's MFT are available.

12.6 County Filter

Depending on how your site is configured, filtering by specific county or group of counties may provide data to isolate problems to specific geographically areas.

The default value for the County filter is *none selected*. All counties in the site's geographical area and entered into the site's MFT are included.

12.7 Facility

You can examine the data quality of records generated by a facility or group of facilities. This could be helpful in localizing procedural issues a facility may encounter.

The default value for the Facility filter is *none selected*. All facilities in the site’s geographical area and included in the site’s MFT are available.

12.8 Completeness Elements

Currently, 48 metrics are available to measure Completeness. Of these, 17 are preselected as the default. The test for completeness is that the filtered elements are included in the data submitted and have values within appropriate ranges.

Figure 48 is a screenshot of the Completeness Elements Filter Selection screen. The Available and Selected Values pick lists fields are not large enough to see all selections.

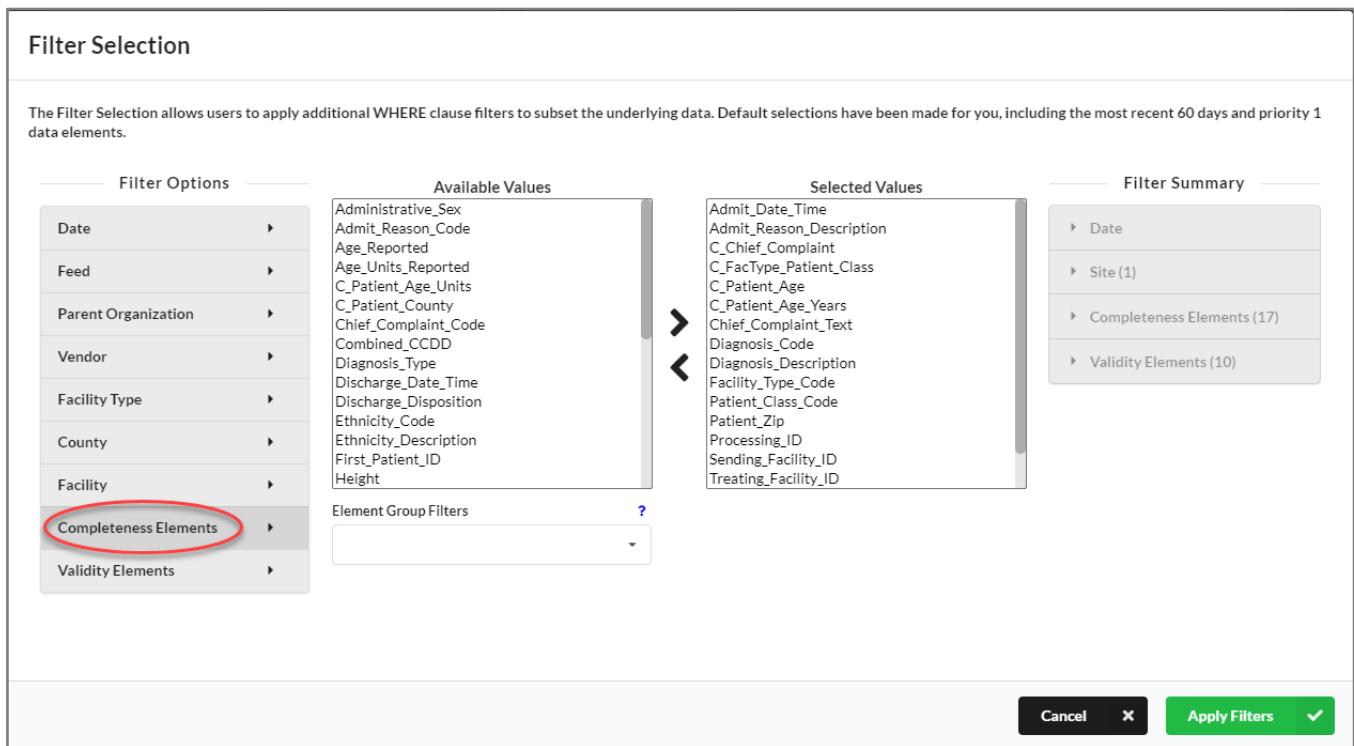


Figure 48. Completeness Elements Filter Selection Screen

See section 4.3 for an in-depth look at Completeness and section 4.4 for Validity Elements Groups. You can use these groups to simplify filter selection.

[Table 12](#) lists the elements that can be used in assessing Completeness. The default selection (Priority 1 group) is shown in the first column while additional elements that be used as filters are in the second and third columns.

Table 12. List of Elements Assessed for Completeness		
Default Filter Values	Additional Available Values	
▪ Admit_Date_Time	▪ Administrative_Sex	▪ Patient_City
▪ Admit_Reason_Description	▪ Admit_Reason_Code	▪ Patient_Country
▪ C_Chief_Complaint	▪ Age_Reported	▪ Procedure_Code
▪ C_FacType_Patient_Class	▪ Age_Units_Reported	▪ Procedure_Combo
▪ C_Patient_Age	▪ C_Patient_Age_Units	▪ Race_Code
▪ C_Patient_Age_Years	▪ C_Patient_County	▪ Race_Description
▪ Chief_Complaint_Text	▪ Chief_Complaint_Code	▪ Recorded_Date_Time
▪ Diagnosis_Code	▪ Combined_CCDD	▪ Sending_Facility_ID_Source
▪ Diagnosis_Description	▪ Diagnosis_Type	▪ Smoking_Status_Code
▪ Facility_Type_Code	▪ Discharge_Date_Time	▪ Travel_History
▪ Patient_Class_Code	▪ Discharge_Disposition	▪ Triage_Notes
▪ Patient_Zip	▪ Ethnicity_Code	▪ Version_ID
▪ Processing_ID	▪ Ethnicity_Description	▪ Weight
▪ Sending_Facility_ID	▪ First_Patient_ID	
▪ Treating_Facility_ID	▪ Height	
▪ Trigger_Event	▪ Insurance_Coverage	
▪ Visit_ID	▪ Medical_Record_Number	

12.9 Validity Elements

Figure 49 shows the Validity Elements Pick List as an example.

Filter Selection

The Filter Selection allows users to apply additional WHERE clause filters to subset the underlying data. Default selections have been made for you, including the most recent 60 days and priority 1 data elements.

Filter Options

- Date ▶
- Feed ▶
- Parent Organization ▶
- Vendor ▶
- Facility Type ▶
- County ▶
- Facility ▶
- Completeness Elements ▶
- Validity Elements ▶

Available Values

- Administrative_Sex
- Age_Reported
- Age_Units_Reported
- C_Patient_Age_Units
- Diagnosis_Type
- Discharge_Disposition
- Ethnicity_Code
- Height
- Insurance_Coverage
- Race_Code
- Smoking_Status_Code
- Weight

Element Group Filters ?

Selected Values

- Admit_Date_Time
- C_Chief_Complaint
- C_FacType_Patient_Class
- C_Patient_Age
- C_Patient_Age_Years
- Diagnosis_Code
- Facility_Type_Code
- Patient_Class_Code
- Patient_Zip
- Trigger_Event

Filter Summary

- ▶ Date
- ▶ Site (1)
- ▶ Completeness Elements (17)
- ▶ Validity Elements (10)

Cancel ×
 Apply Filters ✓

Figure 49. Filter Selection—Validity Elements Available Values and Selected Values Pick Lists

Table 13. List of Elements Assessed for Validity		
Default Filter Values	Additional Available Values	
▪ Admit_Date_Time	▪ Administrative_Sex	▪ Smoking_Status_Code
▪ C_Chief_Complaint	▪ Age_Reported	▪ Weight
▪ C_FacType_Patient_Class	▪ Age_Units_Reported	
▪ C_Patient_Age	▪ C_Patient_Age_Units	
▪ C_Patient_Age_Years	▪ Diagnosis_Type	
▪ Diagnosis_Code	▪ Discharge_Disposition	
▪ Facility_Type_Code	▪ Ethnicity_Code	
▪ Patient_Class_Code	▪ Height	
▪ Patient_Zip	▪ Insurance_Coverage	
▪ Trigger_Event	▪ Race_Code	

12.10 Element Group Filters

Completeness and Validity Element filters are grouped to simplify selection. The following groups can be selected (i.e., displayed to select elements from). Multiple groups may be displayed, with elements from selected groups displayed alphabetically:

Table 14. Element Group Filters	
Priority 1	Visit
Priority 2	Demographics
Facility	Patient Class
Processing	CC & Diagnosis

If no Element Group Filter categories are chosen, then all values not previously selected are available.

The optional group filters, when selected (Figure 50), display all values in that group that weren't already selected elsewhere.

Note: Choosing an Element Group Filter does not select those filters. It just displays them in the Available Values pick list for your consideration.

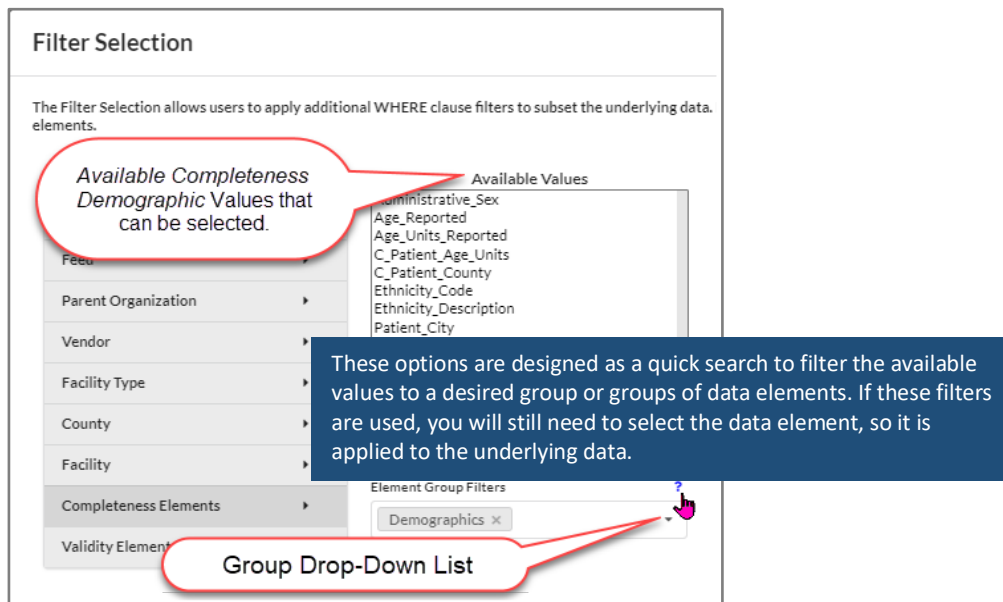


Figure 50. Element Group Filters Displays Available Completeness Demographic Values Only

Multiple groups may be selected from the Element Group Filters drop-down list. These sub-groupings can make it easier to select elements to use as measures of Completeness and Validity. Table 15 lists the Element Group Filters for Completeness and Validity analysis. Groups marked with an "X" provide additional filter elements over and above the default set.

Table 15. Element Groups with Filter Elements in Addition to Default Set					
Element Group	Completeness	Validity	Element Group	Completeness	Validity
Priority 1	Default	Default	Visits	X	X
Priority 2	X	X	Demographics	X	X
Facility	X		Patient Class		



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Technical Guidance

For general information and more resources for the National Syndromic Surveillance Program (NSSP), go to <https://www.cdc.gov/nssp>. For questions and technical support, contact the NSSP Support Desk (password required): support.syndromicsurveillance.org.