

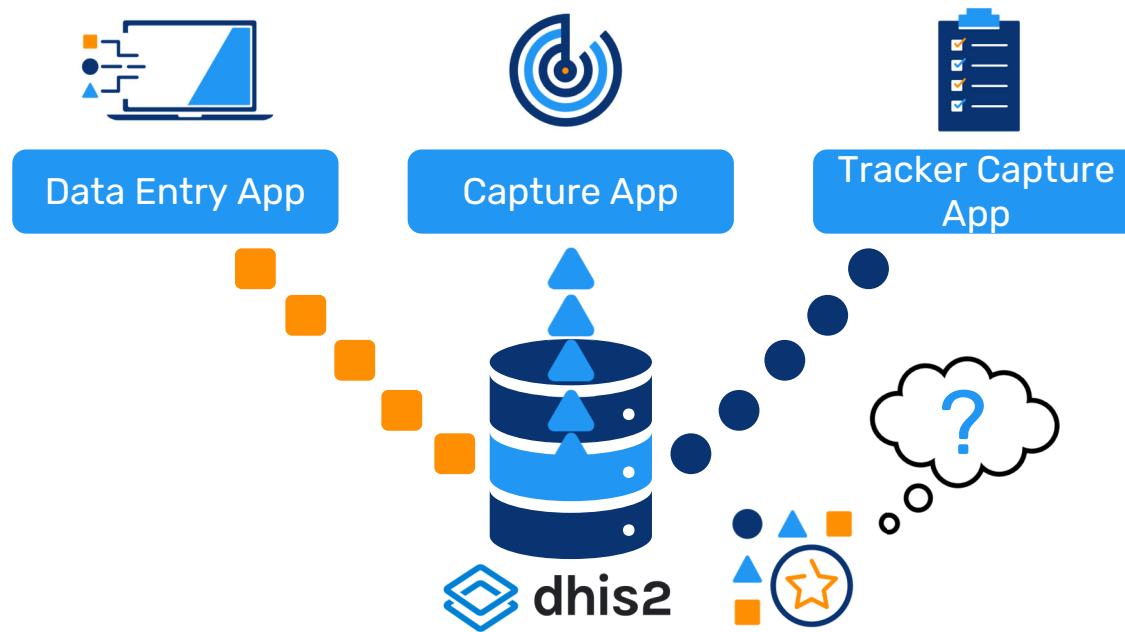


# Data Review in DHIS2

Introduction to DHIS2

My notes

Narration



My notes

## Narration

Once we have our data entered into the platform, how can we check the data's accuracy and reliability?

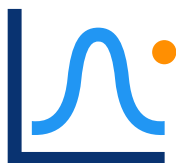
In this video, you will see...



Data Quality app



Validation rule  
analysis



Standard  
deviation  
outlier



Minimum  
maximum  
outlier analysis



Follow-up  
analysis

### Narration

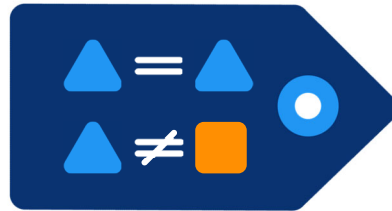
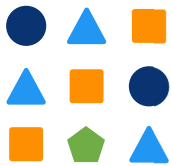
In this video, we will explore several tools in the DHIS2 data quality app that will help us to review and improve the quality of our data

My notes

## Data quality app



### Validation rule analysis



### My notes

### Narration

First, in the Data Quality app, you can run a Validation rule analysis, which tests validation rules against the data registered in the system.

← Validation Rule Analysis ?

More than 500 values found, please narrow the search to see all

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Organisation Unit	Period	Importance	Validation Rule	Value	Operator	Value	Details
Petifu Fulamasa ...					<=	4.00	?
Komboya					>	19.00	?
Petifu Line MCHP					>	12.00	?
Petifu Line MCHP					<=	10.00	?
Ahamadyya Miss...					>	13.00	?
Komendeh (Non...					<=	19.00	?
Alkalia CHP					<=	22.00	?
Peya MCHP					>	22.00	?
Peya MCHP					<=	3.00	?
Komende Luyaim...					<=	5.00	?
Allen Town Healt...	February 2021	MEDIUM	Malaria outbreak	10.00	>	13.00	?
Allen Town Healt...	February 2021	MEDIUM	ANC 2 cannot be...	18.00	<=	12.00	?
Philip Street Clinic	February 2021	MEDIUM	ANC 2 cannot be...	18.00	<=	11.00	?
Approved School...	February 2021	MEDIUM	ANC 2 cannot be...	36.00	<=	24.00	?
Komrabai Station...	February 2021	HIGH	Maternal Death ...	1.00	<=	0.00	?

Validation Details

**VALIDATIONS RESULT DETAILS**

**VALIDATION RULE**

Name: ANC 3 <= ANC 2

Description: ANC 3 cannot be higher than ANC 2

**LEFT SIDE**

DATA ELEMENT	VALUE
ANC 3rd visit Outreach	1.00
ANC 3rd visit Fixed	5.00

**RIGHT SIDE**

DATA ELEMENT	VALUE
ANC 2nd visit Outreach	1.00
ANC 2nd visit Fixed	3.00

CLOSE

My notes

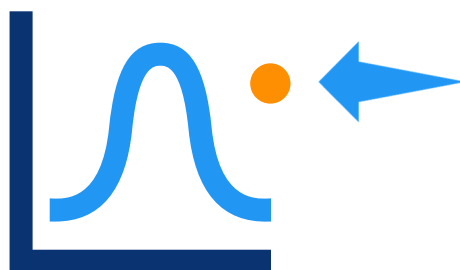
## Narration

After running the check, you will get a report with a list of data that need to be checked. For example, if we look at the first row, our validation rule says that the value registered for the 3rd Antenatal care visit, or ANC, cannot be higher than the value registered for the second ANC visit. But the value registered of ANC 3 is 6, while the value of ANC2, is 4. We can follow up with this location to determine the specific source of the error. Note that you can also run the validation rule analysis during the data entry process.

## Standard deviation outlier



Standard deviation outlier



My notes

### Narration

The Standard deviation outlier analysis is another tool we can use to check data quality, identifying those values that are potential outliers when compared to the standard normal distribution of the data we are reviewing.

Validation Rule Analysis

Std Dev Outlier Analysis ?

Min-Max Outlier Analysis

Follow-Up Analysis

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Data Element	Organisation Unit	Period	Min	Value	Max	Mark
EPI - OPV 0 doses gi...	Banana Health Centre	January 2021	67.00	7.00	290.00	<input type="checkbox"/>
EPI - OPV 1 doses gi...	Banana Health Centre	January 2021	76.00	8.00	315.00	<input type="checkbox"/>
EPI - OPV 1 doses gi...	Banana Health Centre	January 2021	-2.00	9.00	8.00	<input type="checkbox"/>
EPI - PCV 1 doses gi...	Banana Health Centre	January 2021	84.00	23.00	312.00	<input type="checkbox"/>
EPI - PCV 1 doses gi...	Banana Health Centre	January 2021	-20.00	2.00	28.00	<input type="checkbox"/>
EPI - BCG doses given	Banana Health Centre	January 2021	81.00	5.00	351.00	<input type="checkbox"/>
EPI - DPT-HepB-HIB 2...	Banana Health Centre	January 2021	2.00	34.00	2.00	<input type="checkbox"/>
EPI - DPT-HepB-HIB 2...	Banana Health Centre	January 2021	-2.00	56.00	3.00	<input type="checkbox"/>
EPI - RV 1 doses given	Banana Health Centre	January 2021	74.00	12.00	304.00	<input type="checkbox"/>
EPI - RV 1 doses given	Banana Health Centre	January 2021	-20.00	43.00	28.00	<input type="checkbox"/>
EPI - TT 2 doses given	Banana Health Centre	January 2021	-36.00	98.00	66.00	<input checked="" type="checkbox"/>
EPI - MR 2 doses giv...	Banana Health Centre	January 2021	60.00	0.00	270.00	<input type="checkbox"/>
EPI - TT 1 doses given	Banana Health Centre	January 2021	8.00	56.00	46.00	<input checked="" type="checkbox"/>
EPI - PCV 3 doses gi...	Banana Health Centre	January 2021	68.00	3.00	296.00	<input type="checkbox"/>

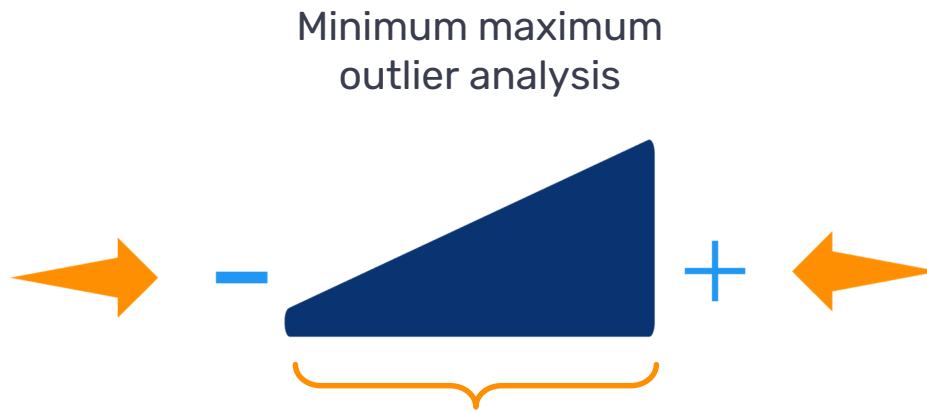
My notes

## Narration

Like in the validation rule analysis, when we run a standard deviation outlier analysis, we get a report like this with all the data that need to be checked.

For example, in this row, the data indicate that only 5 BCG vaccines were given in this health facility, this value of 5 falls outside of the normal distribution of this data and has been identified as a potential source of error.

## Minimum maximum outlier analysis



### Narration

Another tool is the Min/max outlier analysis, which checks if the data are within a predefined range that has been specified for them.

### My notes



Validation Rule Analysis

Std Dev Outlier Analysis

Min-Max Outlier Analysis

Follow-Up Analysis

← Min-Max Outlier Analysis ?

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Data Element	Organisation Unit	Period	Min	Value	Max	Mark
EPI - AEFI suspected ...	Banana Health Centre	January 2021	0.00	45.00	22.00	<input checked="" type="checkbox"/>
EPI - AEFI suspected ...	Banana Health Centre	January 2021	0.00	2.00	2.00	<input type="checkbox"/>
EPI - BCG doses given	Banana Health Centre	January 2021	143.00	5.00	280.00	<input type="checkbox"/>
EPI - DPT-HepB-HiB 1...	Banana Health Centre	January 2021	122.00	7.00	274.00	<input type="checkbox"/>
EPI - DPT-HepB-HiB 1...	Banana Health Centre	January 2021	0.00	9.00	6.00	<input type="checkbox"/>
EPI - DPT-HepB-HiB 2...	Banana Health Centre	January 2021	144.00	34.00	279.00	<input type="checkbox"/>
EPI - DPT-HepB-HiB 2...	Banana Health Centre	January 2021	0.00	56.00	17.00	<input type="checkbox"/>
EPI - DPT-HepB-HiB 3...	Banana Health Centre	January 2021	134.00	53.00	240.00	<input type="checkbox"/>
EPI - DPT-HepB-HiB 3...	Banana Health Centre	January 2021	0.00	21.00	9.00	<input type="checkbox"/>
EPI - IPV doses given	Banana Health Centre	January 2021	111.00	34.00	234.00	<input type="checkbox"/>
EPI - MR 1 doses giv...	Banana Health Centre	January 2021	127.00	7.00	260.00	<input type="checkbox"/>
EPI - MR 1 doses giv...	Banana Health Centre	January 2021	0.00	9.00	6.00	<input type="checkbox"/>
EPI - MR 2 doses giv...	Banana Health Centre	January 2021	91.00	0.00	210.00	<input type="checkbox"/>
EPI - OPV 0 doses gi...	Banana Health Centre	January 2021	119.00	7.00	234.00	<input type="checkbox"/>

My notes

## Narration

This lists the values that are out of this predefined range. We can see in the example a value of 45 AEFI suspected cases, which is out of the predefined range of a minimum of 0 to a maximum of 22.

## Follow-up analysis



Follow-up analysis



List of data values  
marked for follow-up

My notes

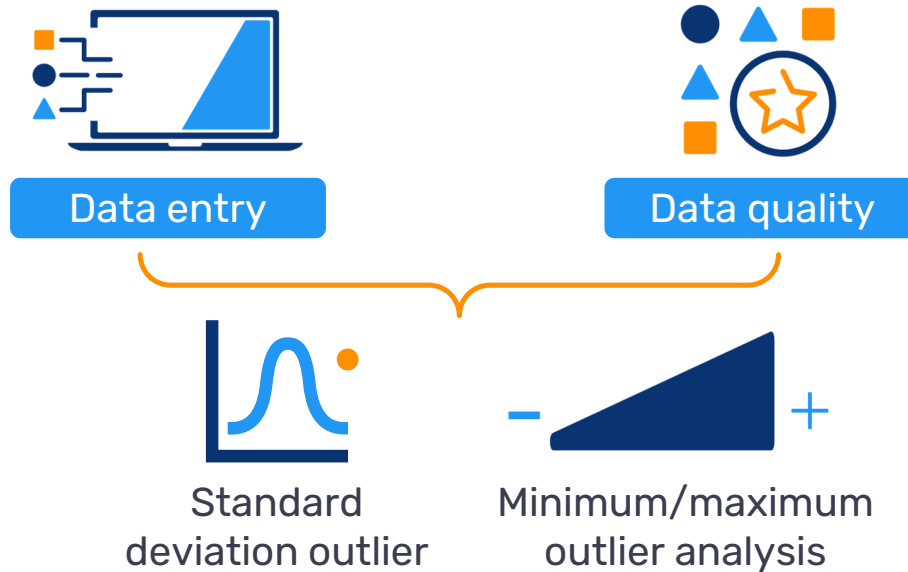
### Narration

The fourth and last tool available in the Data Quality App is the Follow-up analysis tool. Follow-up analysis creates a list of all data values marked for follow-up.

## Follow-up analysis



List of data values marked for follow-up:



### Narration

We can mark a data value for follow-up in the Data Entry app and the Data Quality app via the reports from the standard deviation outlier and min/max outlier analysis tools.

### My notes

This is an example of the report obtained after running a follow-up analysis in DHIS2.

## WHO Data Quality Tool



WHO Data Quality  
Review Framework



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### Narration

In coordination with WHO, a Data Quality tool for DHIS2 has also been created. This app generates findings on data quality following WHO's Data Quality Review Framework.

### My notes

## WHO Data Quality Tool



### WHO Data Quality Review Framework



- Completeness
- Timeliness
- Internal consistency
- External consistency

### My notes

### Narration

This includes completeness, that is, if all the expected data are recorded; timeliness, or if the data was received on time, internal consistency, which compares internally submitted data with one another, and external consistency, which compares the data with other sources such as surveys

# DEMO

## My notes

## Narration

As an example, we can review internal consistency. The WHO Data Quality tool allows us to identify outliers within our data. We can see an example of this in District C-1, where the number of Measles vaccines given in January 2020 is much higher in comparison to the other values reported within the same district in the same year.

## Example of internal consistency



Region	Unit	Data	Jan 19	Feb 19	Mar 19	Apr 19	May 19	Jun 19	Jul 19	Aug 19	Sep 19	Oct 19	Nov 19	Dec 19	Weight ⓘ			
															Missing	Outlier	Total ⓘ	
Region C	District C-1	Measles vaccine given	17555.0	1772.0	2304.0	1983.0	2126.0	1875.0	2193.0	2206.0	2424.0	1890.0	3182.0	2789.0	0	15306	15306	⌵
Region C	District C-5	BCG given < 1	4310.0	4342.0	4396.0	11665.0	3460.0	3294.0	3438.0	3199.0	3118.0	2941.0	2986.0	7570.0	0	12138	12138	⌵
Region C	District C-6	BCG given < 1	1350.0	1069.0	1434.0	1084.0	1047.0	1583.0	1223.0	1354.0	1356.0	1326.0	1407.0	4045.0	0	2751	2751	⌵
Region D	District D-1	OPV 2 given < 1	9183.0	7411.0	7840.0	6964.0	6706.0	6115.0	6686.0	6995.0	6958.0	7262.0	5998.0	7790.0	0	2208	2208	⌵
Region D	District D-1	OPV 1 given < 1	9213.0	7492.0	7866.0	7054.0	6859.0	6254.0	6805.0	7102.0	7053.0	7261.0	5907.0	7990.0	0	2155	2155	⌵
Region D	District D-1	OPV 3 given < 1	8362.0	6807.0	7172.0	6397.0	6132.0	5673.0	6180.0	6432.0	6375.0	6551.0	5463.0	7148.0	0	1968	1968	⌵
Region D	District D-1	Measles vaccine given	6508.0	6327.0	6925.0	6408.0	8139.0	6436.0	6303.0	6335.0	7217.0	5867.0	5142.0	7290.0	0	1706	1706	⌵
Region C	District C-5	OPV 1 given < 1	5421.0	4438.0	4036.0	4186.0	3892.0	2717.0	3610.0	4168.0	4031.0	3103.0	3184.0	3870.0	0	1672	1672	⌵
Region C	District C-5	OPV 2 given < 1	5327.0	4436.0	3949.0	4200.0	3886.0	2647.0	3524.0	4115.0	3966.0	3059.0	3127.0	3814.0	0	1625	1625	⌵
Region A	District A-2	Penta 3 given < 1	1493.0	1599.0	1483.0	1434.0	1139.0	1483.0	1701.0	1751.0	1417.0	1318.0	3002.0	1166.0	0	1549	1549	⌵
Region C	District C-5	OPV 3 given < 1	4906.0	4051.0	3642.0	3805.0	3517.0	2426.0	3257.0	3767.0	3655.0	2812.0	2862.0	3506.0	0	1515	1515	⌵
Region D	District D-1	Rotavirus vaccine 1 given < 1	8313.0	7409.0	7495.0	7134.0	7238.0	6774.0	6844.0	7046.0	7006.0	7233.0	5855.0	7798.0	0	1444	1444	⌵
Region D	District D-1	Penta 1 given < 1	8544.0	7743.0	8065.0	7268.0	7556.0	6982.0	6895.0	7259.0	7265.0	7551.0	6201.0	7991.0	0	1355	1355	⌵
Region C	District C-1	OPV 3 given < 1	2405.0	973.0	2169.0	2056.0	2005.0	2072.0	2473.0	2432.0	2576.0	2290.0	2213.0	2473.0	0	1315	1315	⌵
Region D	District D-1	Penta 2 given < 1	8234.0	7284.0	7587.0	7033.0	7122.0	6731.0	6655.0	7003.0	6937.0	7258.0	5914.0	7635.0	0	1311	1311	⌵

### Narration

This helps us easily visualize what data need to be double-checked before running any analysis.

### My notes



## Summary



- Tools in the DHIS2 Data Quality app
  - ✓ Validation rules
  - ✓ Standard deviation outlier analysis
  - ✓ Minimum/maximum outlier analysis
  - ✓ Follow-up analysis
- WHO Data Quality Tool:
  - ✓ Completeness
  - ✓ Timeliness
  - ✓ Internal consistency
  - ✓ External consistency

### My notes

### Narration

In summary, in DHIS2 there are several tools that help us to check the quality of the data entered, such as validation rules, standard deviation outlier analysis, minimum/maximum outlier analysis, and follow-up analysis.

DHIS2 and WHO have also collaborated to create a Data Quality tool that runs checks to validate completeness, timeliness, internal consistency, and external consistency.

My notes



UiO : **University of Oslo**

[www.dhis2.org/academy](http://www.dhis2.org/academy)

Narration