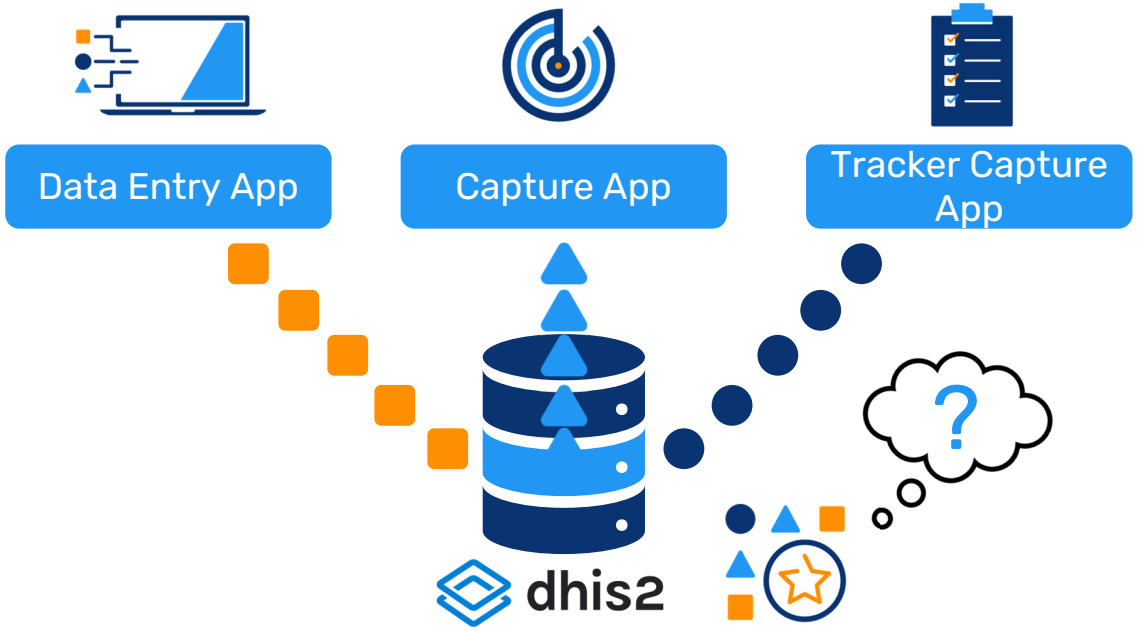
My notes

Narration



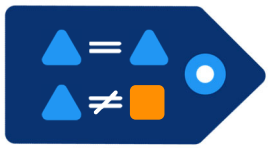
My notes

Narration

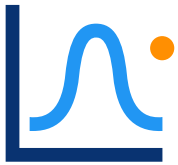
Once we have our data entered into the platform, how can we check the data's accuracy and reliability?

In this video, you will see...

Data Quality app



Validation rule analysis



Outlier analysis

Follow-up analysis

My notes

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

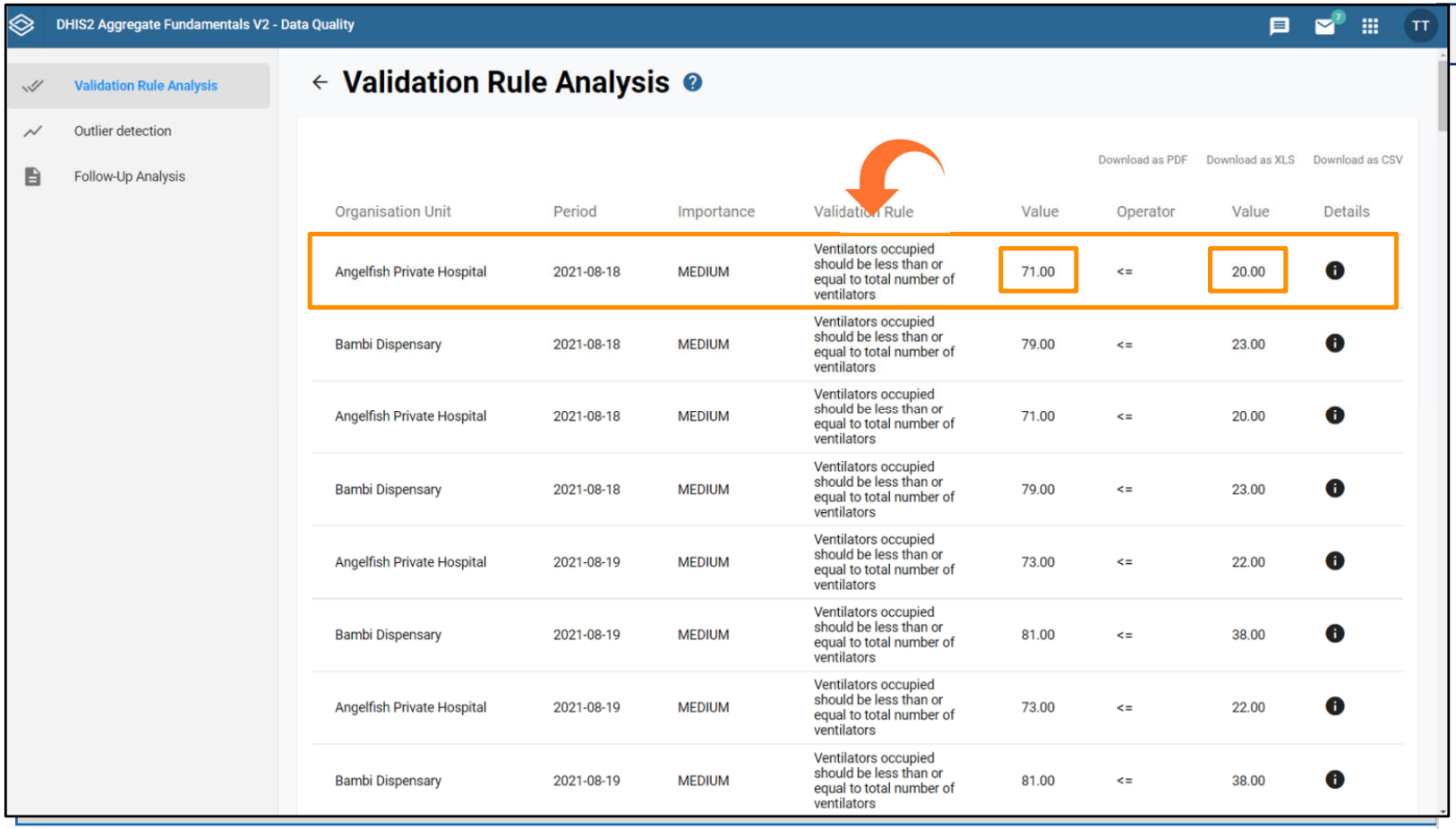
Data quality app

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.



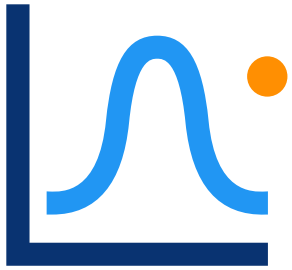
My notes

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 ventilators occupied should be less than or equal to the total number of ventilators. But the value registered for ventilators occuppied is 71, while the value of number of available is 20. 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.

Outlier Analysis

Outlier Analysis

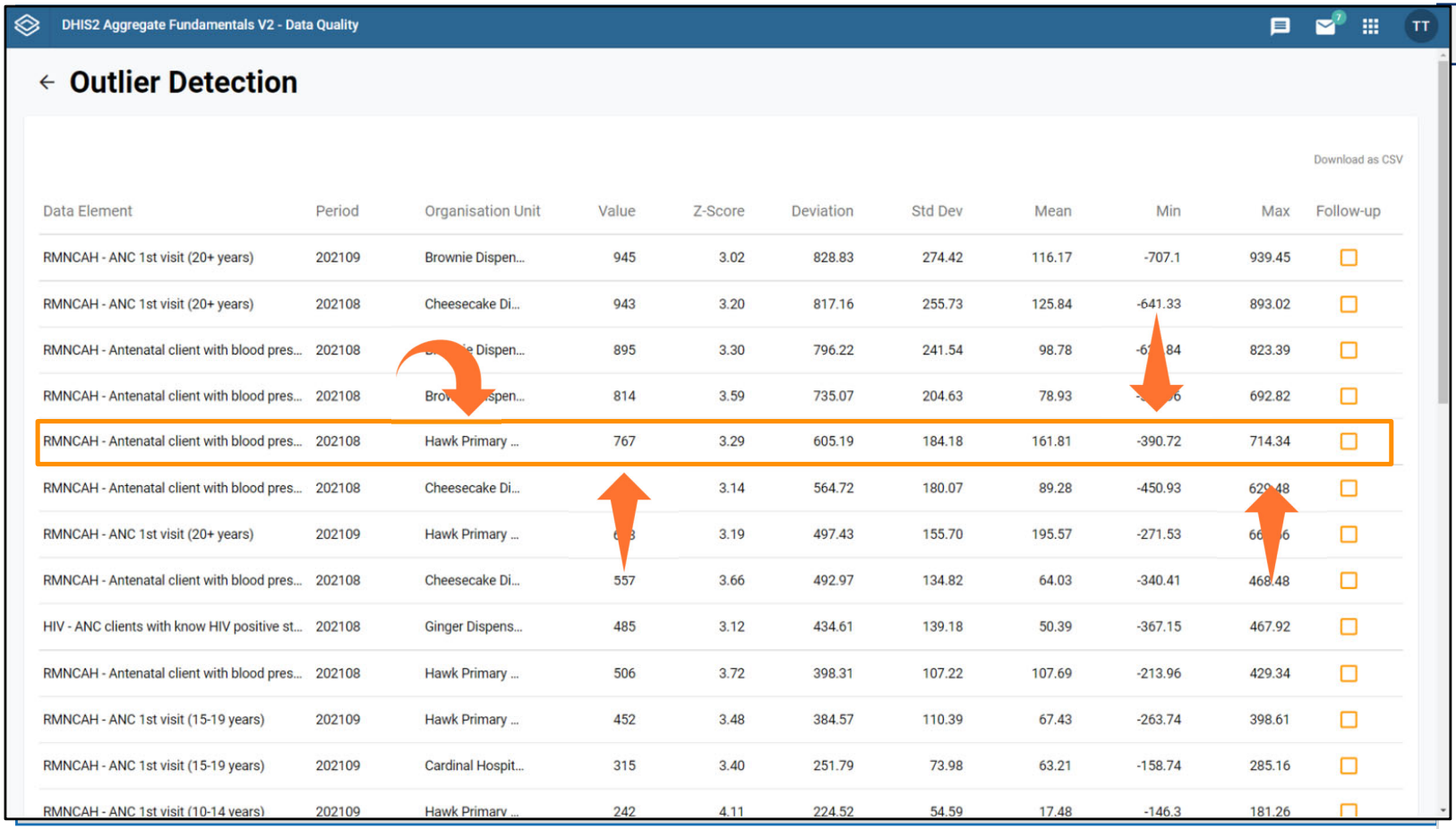


- Standard normal distribution
- Minimum maximum values

My notes

Narration

The outlier analysis is another tool we can use to check data quality.
It can identify values that are potential outliers when compared to the standard normal distribution of the data under review, or it can check the data against a pre-defined minimum and maximum value range. If the data fall outside that range, it will be identified as a potential outlier.



Data Element	Period	Organisation Unit	Value	Z-Score	Deviation	Std Dev	Mean	Min	Max	Follow-up
RMNCAH - ANC 1st visit (20+ years)	202109	Brownie Dispen...	945	3.02	828.83	274.42	116.17	-707.1	939.45	☐
RMNCAH - ANC 1st visit (20+ years)	202108	Cheesecake Di...	943	3.20	817.16	255.73	125.84	-641.33	893.02	☐
RMNCAH - Antenatal client with blood pres...	202108	[illegible] Dispen...	895	3.30	796.22	241.54	98.78	-67[illegible]84	823.39	☐
RMNCAH - Antenatal client with blood pres...	202108	Brow[illegible]spen...	814	3.59	735.07	204.63	78.93	-[illegible]6	692.82	☐
RMNCAH - Antenatal client with blood pres...	202108	Hawk Primary ...	767	3.29	605.19	184.18	161.81	-390.72	714.34	☐
RMNCAH - Antenatal client with blood pres...	202108	Cheesecake Di...	[illegible]	3.14	564.72	180.07	89.28	-450.93	629.48	☐
RMNCAH - ANC 1st visit (20+ years)	202109	Hawk Primary ...	[illegible]	3.19	497.43	155.70	195.57	-271.53	66[illegible]6	☐
RMNCAH - Antenatal client with blood pres...	202108	Cheesecake Di...	557	3.66	492.97	134.82	64.03	-340.41	468.48	☐
HIV - ANC clients with know HIV positive st...	202108	Ginger Dispens...	485	3.12	434.61	139.18	50.39	-367.15	467.92	☐
RMNCAH - Antenatal client with blood pres...	202108	Hawk Primary ...	506	3.72	398.31	107.22	107.69	-213.96	429.34	☐
RMNCAH - ANC 1st visit (15-19 years)	202109	Hawk Primary ...	452	3.48	384.57	110.39	67.43	-263.74	398.61	☐
RMNCAH - ANC 1st visit (15-19 years)	202109	Cardinal Hospit...	315	3.40	251.79	73.98	63.21	-158.74	285.16	☐
RMNCAH - ANC 1st visit (10-14 years)	202109	Hawk Primary ...	242	4.11	224.52	54.59	17.48	-146.3	181.26	☐

My notes

Narration

Like in the validation rule analysis, when we run an outlier analysis, we get a report with all the data that need to be checked.
For example, in this row, the data indicate 767 antenatal clients had their blood pressure checked in to this health facility, and this value of 767 falls outside of the normal distribution of these data and has been identified as a potential source of error.

Follow-up analysis

Follow-up analysis

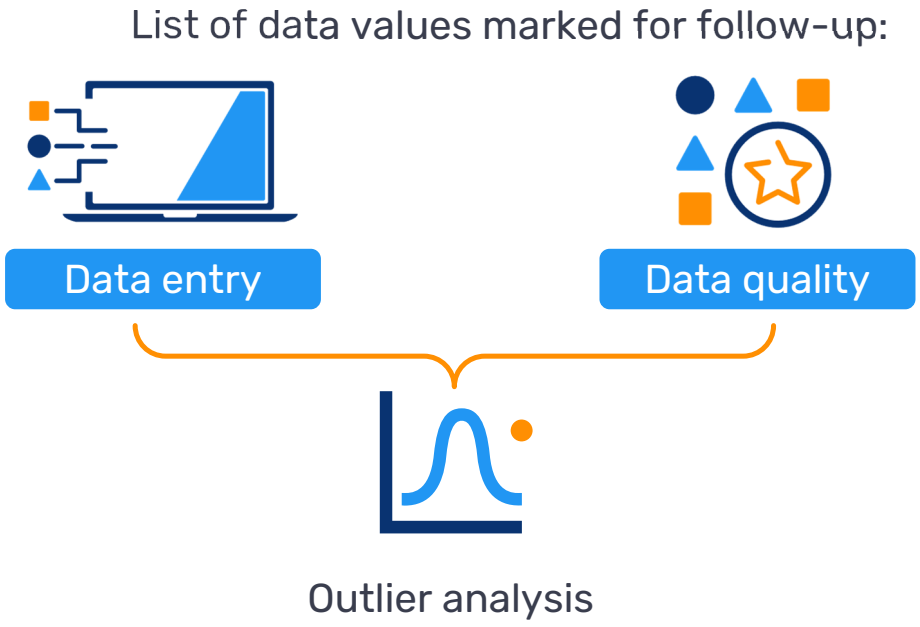
List of data values marked for follow-up

My notes

Narration

The third and final 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.

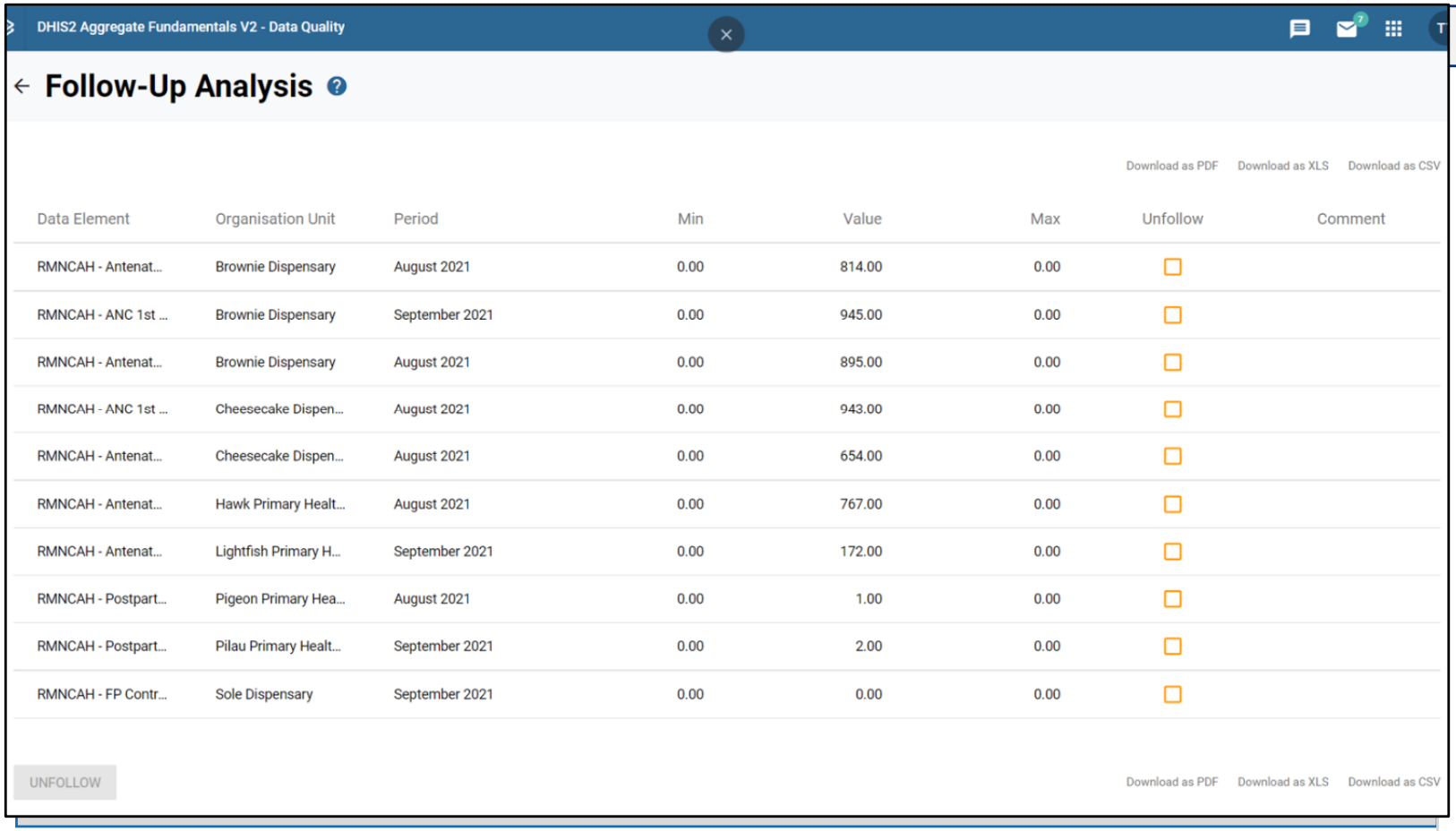
Follow-up analysis



My notes

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 outlier analysis tool.



My notes

Narration

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

WHO Data Quality Tool

My notes

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.

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	Weight Outlier	Weight 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

My notes

Narration

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

Summary

- Tools in the DHIS2 Data Quality app
  - ✓ Validation rules
  - ✓ 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, 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.

dhis2

UiO : University of Oslo

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My notes

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