Level 2 Data Quality Academy

Data Quality in Tracker Programs

Overview

- Transfering data from tracker to aggregate
- Common issues with data quality in patient records.
- Program rules for data quality checks
- Monitoring completness through program indicators

Common Issues

- Complex data entry with little or no workflow support
  - Incorrect patient data
- Calculating coverage baseded upon only tracker data
- Calculating completness from individual patient data

Program Rules

- Program rules provide a way to produce dynamic behaviors in response to user input in tracker and event capture
- Program rules allows you to create and control dynamic behavior of the user interface in the **Tracker Capture** and **Event Capture** apps
- During data entry, program rule expressions are evaluated each time the user interface is displayed and each time a data element is changed

Program Rules

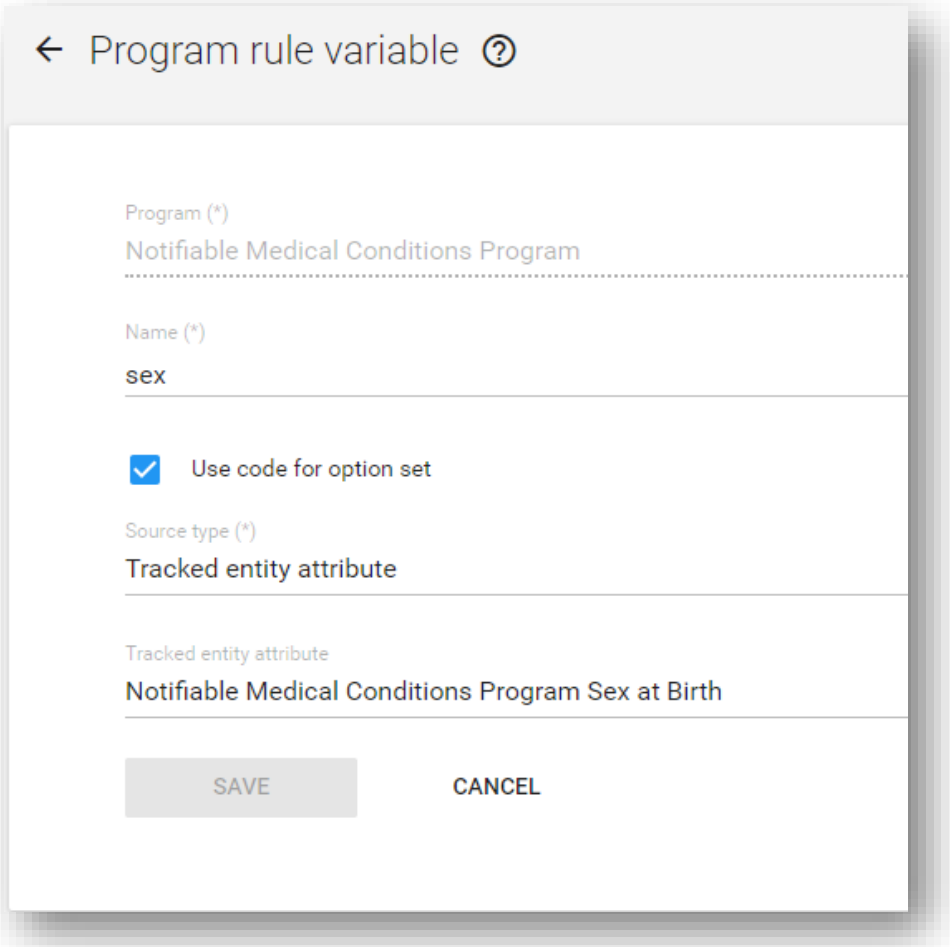
- Most types of actions will take effect immediately when the user enters values in the **Tracker Capture** and **Event Capture** apps
- Program rules consist of three components:
  - Variables
  - Expressions
  - Actions

Program Rules - Variables

- Program rule variables represent attribute and data element values which will be evaluated as part of the expression -- ***are the first step in making rules***
- They create a uniform way to include data values and attribute values in expressions and actions
- The program rule variable is defined as needed when creating expressions and actions
- When creating your first expression, you will typically have to define one or more program rule variables, as expressions usually contain at least one data element or attribute value to be meaningful
- The program rule variables are shared between all rules in your program, and by creating several rules, these will share the same library of program rule variables

Program Rules - Variables

Example: You would like to use the attribute “Sex” in your expression. You would first define this as a program rule variable



Program Rule - Expressions

- During data entry, program rule **expressions** are evaluated each time the user interface is displayed, and each time a data element is changed
- Most types of actions will take effect immediately as the user enters values in tracker or event capture
- Expressions are built from **program rule variables**, **operators** and user-defined **static values**

Program Rules - Operators

Operators are updated regularly in the docs

Program Rules – Examples for data quality

- #{TrainedAdolescentHealthStaff} > #{FacilityStaff}
  - Assesses if there are more staff trained in adolescent health then staff within the entire facility
- #{vaccinedoses} >= 0 && #{vaccinedoses} <= 4
  - Assesses if the number of vaccines doses is greater than or equal to 0 **AND** less than or equal to 4
- (#{SampleType} == 'Plasma' || #{SampleType} == 'Sputum') && Sex == 'MALE'
  - Assesses if the lab sample type is Plasma **OR** Sputum and the sex is male

Program Rules - Custom Functions

- There are advanced functions that can be used in program rule expressions
- Examples include:

Function	Argument	Description
d2:ceil	(number)	Rounds the input argument **up** to the nearest whole number.
d2:monthsBetween	(date,date)	Produces the number of full months between the first and second argument.
d2:hasValue	(sourcefield)	Evaluates to true if the argument source field contains a value, false if no value is entered

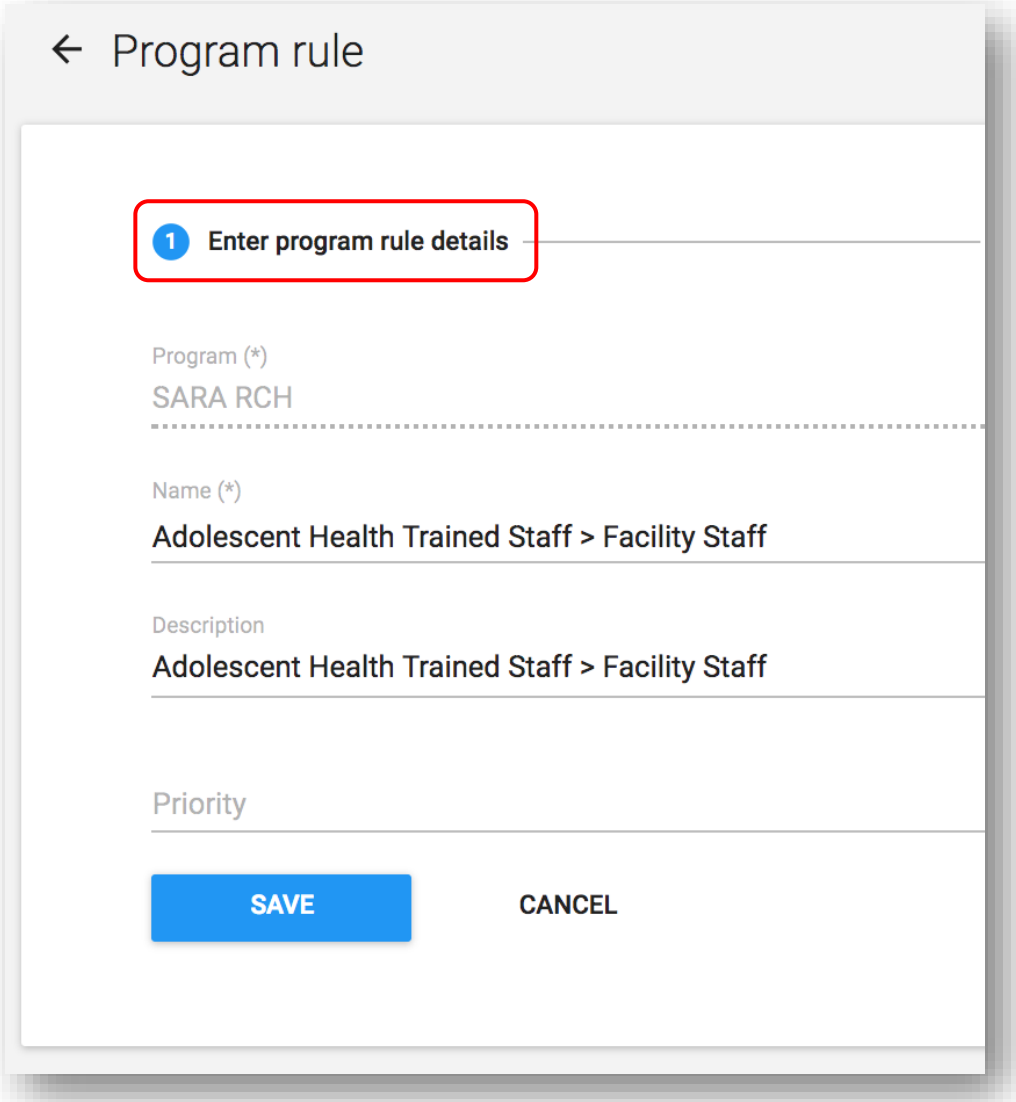
Program Rules - Custom Function Examples

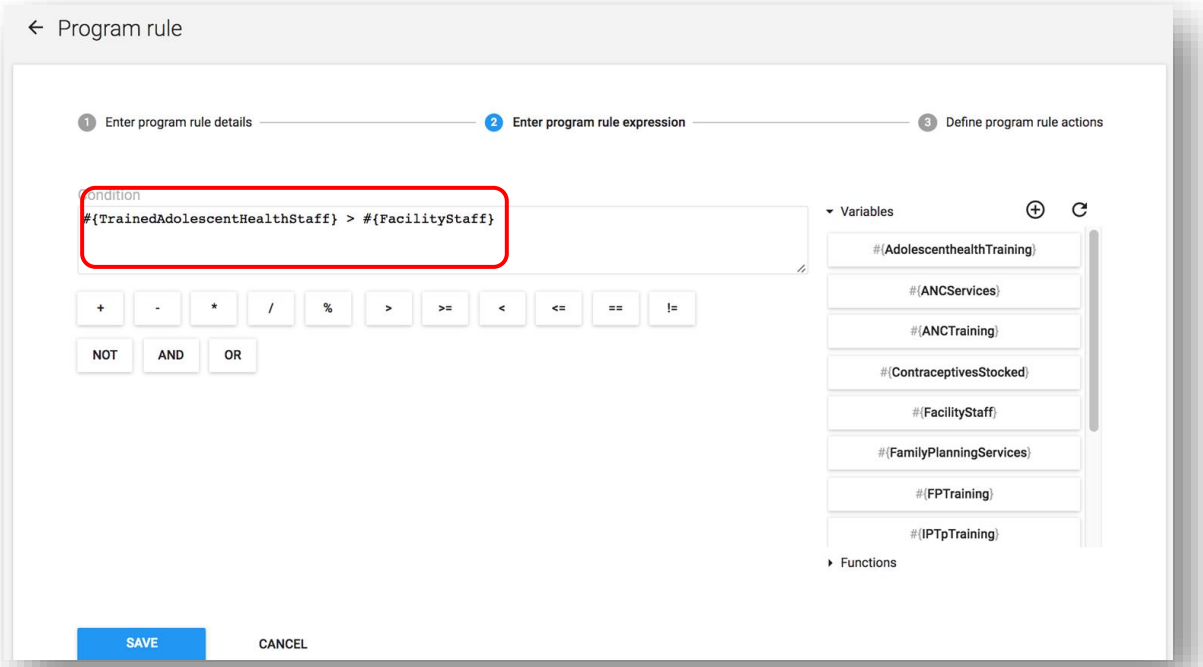
- d2:ceil(#{hemoglobinValue})
  - If a value of 7.3 is entered for the hemoglobin value, this expression will round it up to 8
- d2:monthsbetween(#{sampledate}, '2016-01-01')
  - If the sample date is June 16, 2016, it will return a value of 5
- d2:hasValue('vaccinedoses')
  - If no value is entered this evaluates to false. If any value is entered, this will evaluate to true

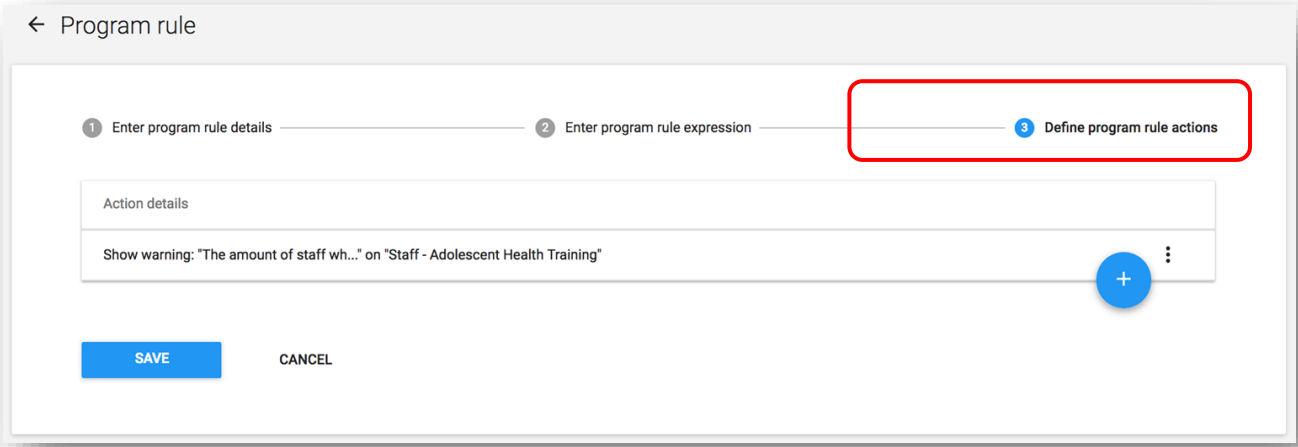
Program Rules - Actions

- Each program rule has one or more actions attached to it
- These are the behaviors that are triggered in the user interface when the expression is true
- Actions will be applied at once if the expression is true, and will be reverted if the expression is no longer true
- There are several types of actions

Program Rules - Summary







Program Rules - Steps

1. Conceptualise the logic of the rule you want to create
2. Create a source field that points to the data element/attribute which will trigger your logic
3. Create a new program rule
    a. Fill in the program rule details
        i. Select the program
        ii. Provide a name and description
        iii. Assign a priority if applicable
4. Enter the program rule expression
    a. Refer the the documentation to see many examples of the items that can be used within the expression, as well as examples of expressions
5. Define the program rules actions
    a. Refer to the documentation for more detail on each individual action
6. Clear your cache and test the rule!

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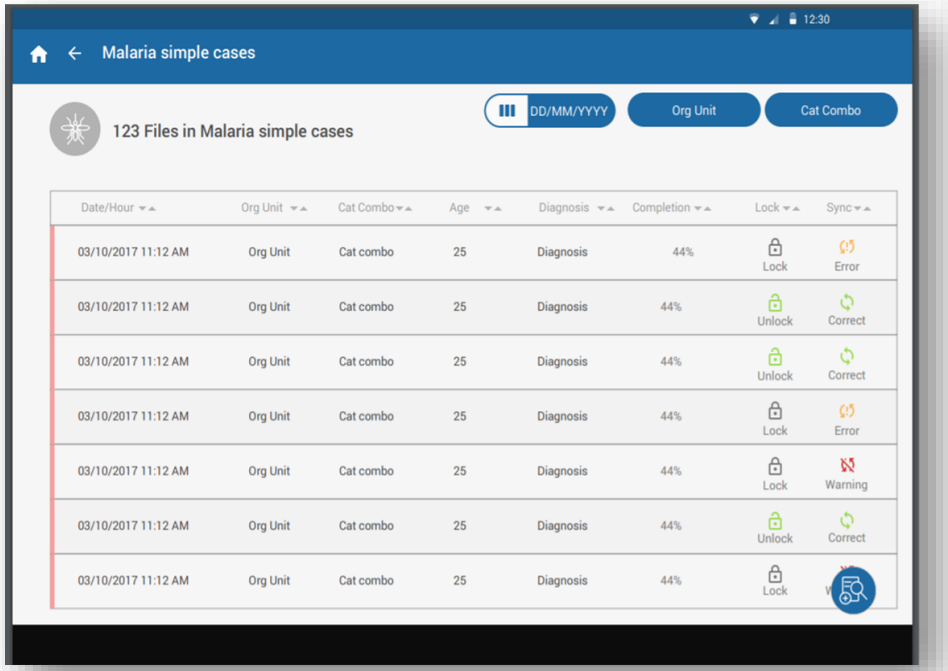
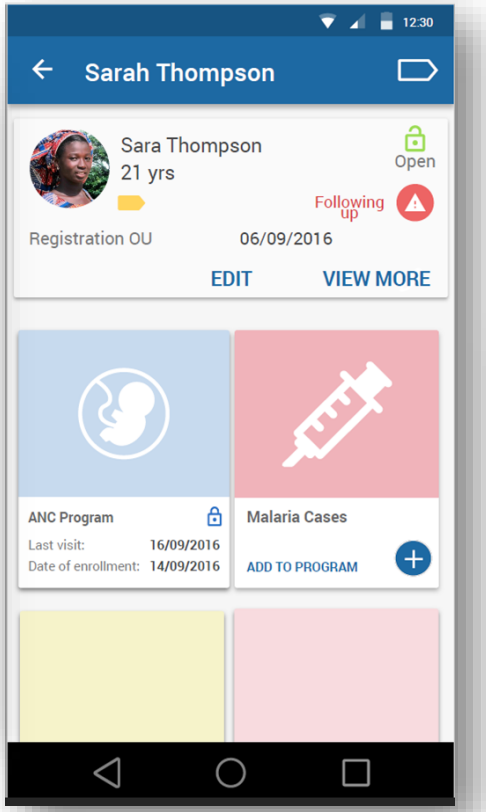
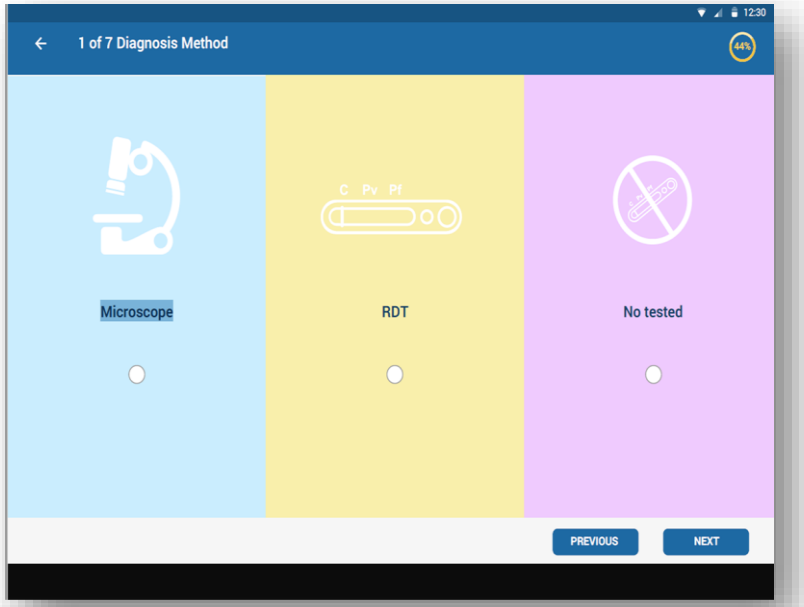
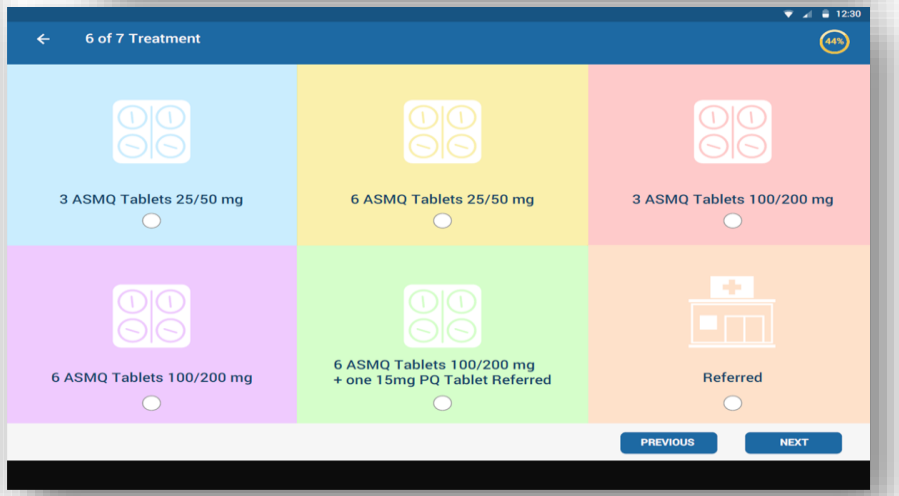

12:30
Malaria simple cases
123 Files in Malaria simple cases
DD/MM/YYYY
Org Unit
Cat Combo
Date/Hour
Org Unit
Cat Combo
Age
Diagnosis
Completion
Lock
Sync
03/10/2017 11:12 AM
Org Unit
Cat combo
25
Diagnosis
44%
Lock
Error
Unlock
Correct
Warning


12:30
Sarah Thompson
Sara Thompson
21 yrs
Open
Following up
Registration OU
06/09/2016
EDIT
VIEW MORE
ANC Program
Last visit:
16/09/2016
Date of enrollment:
14/09/2016
Malaria Cases
ADD TO PROGRAM


12:30
1 of 7 Diagnosis Method
44%
Microscope
C Pv Pf
RDT
No tested
PREVIOUS
NEXT


12:30
6 of 7 Treatment
44%
3 ASMQ Tablets 25/50 mg
6 ASMQ Tablets 25/50 mg
3 ASMQ Tablets 100/200 mg
6 ASMQ Tablets 100/200 mg
6 ASMQ Tablets 100/200 mg
+ one 15mg PQ Tablet Referred
Referred
PREVIOUS
NEXT

Program Indicators

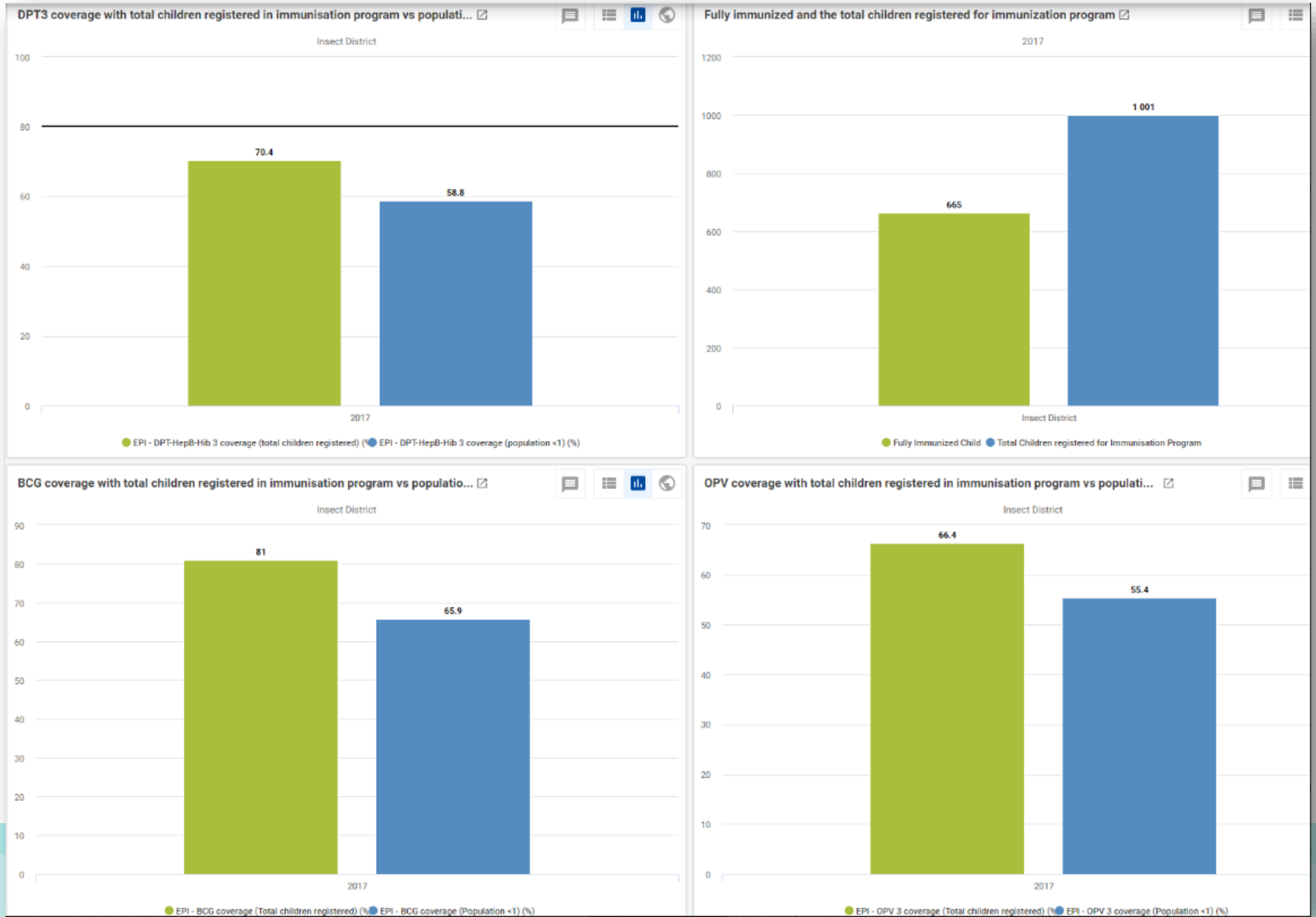
- Program indicators allow for the creation of values based on **data elements** and/or **attributes** belonging to event or tracker programs
- Program indicators use a combination of **expression**, **aggregation type** and **filters** in order to determine how the indicator will be evaluated

Example Program Indicators

- Completeness of data elements in tracker programs.
  - Count of BCG Doses given / Total number of tracked children
  - Return the percentage of tracked children who have a recoded a BCG Dose

Coverage Indicators Using Tracker Data

- Indicators using both denominators (registrations and population) rather then prescribing one over the other;
  - we generally wouldn't recommend using only registrations alone.
- Have a series of charts to then highlight the differences in coverage between the indicators calculated using both methodologies.


DPT3 coverage with total children registered in immunisation program vs populati...
Insect District
100
80
60
40
20
0
70.4
58.8
2017
EPI - DPT-HepB-Hib 3 coverage (total children registered) (%)
EPI - DPT-HepB-Hib 3 coverage (population <1) (%)
Fully immunized and the total children registered for immunization program
2017
1200
1000
800
600
400
200
0
665
1 001
Insect District
Fully Immunized Child
Total Children registered for Immunisation Program
BCG coverage with total children registered in immunisation program vs populatio...
Insect District
90
80
70
60
50
40
30
20
10
0
81
65.9
2017
EPI - BCG coverage (Total children registered) (%)
EPI - BCG coverage (Population <1) (%)
OPV coverage with total children registered in immunisation program vs populati...
Insect District
70
60
50
40
30
20
10
0
66.4
55.4
2017
EPI - OPV 3 coverage (Total children registered) (%)
EPI - OPV 3 coverage (Population <1) (%)

Monitoring aggregate data compiled from tracker to assure that errors have not occurred in data transfer

- The exchange mechanism to ensure it is transferring the data
  - usually this is approved data is aggregated via program indicators.
- This would generally be transferred to data elements in the aggregate warehouse and should match the input 1-1 from the tracker system; this can be checked after the transfer is complete

Required for transfering data:

1. The program indicators (or system specific process if DHIS2 is not being used) necessary to aggregate and anonymize your data
2. The data approval/review process in place to check everything before the transfer
3. The mechanism to move the data from one system to another
4. The review process in place to check after the transfer
5. Any other data quality checks you would normally apply to this data