

# Learner's Guide to Indicators

## What is this guide?

This guide contains all exercises and detailed steps to perform them related to the review of **indicators** for the Design for Data Use Level 1 academy. Please perform each of the exercises when prompted to by your instructors

## Learning objectives for this session

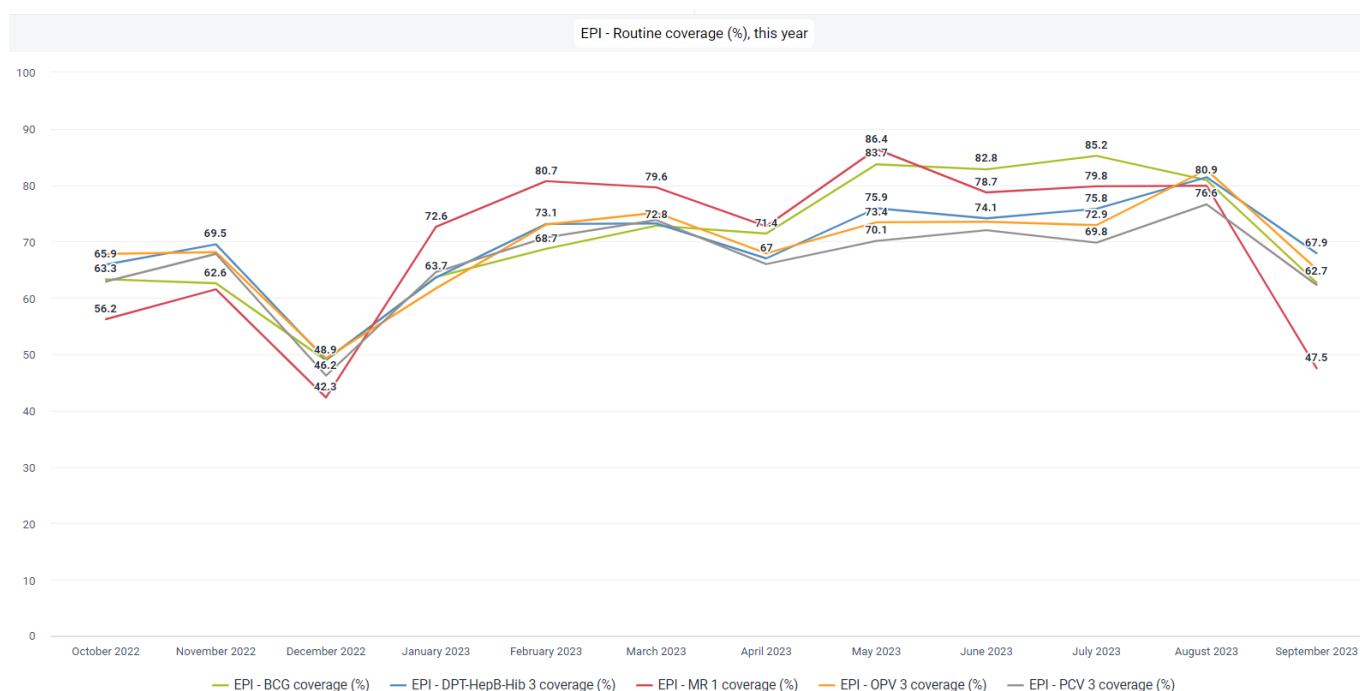
1. Define indicators in DHIS2
2. Create outputs using indicators and indicator groups
3. Create indicators in the maintenance app
4. Create indicator groups and group sets in the maintenance app
5. Describe the relationship between indicators and analytics

## Exercise 1 - Review the different types of indicators via the analysis apps

**Perform this exercise in the DEMONSTRATION system**

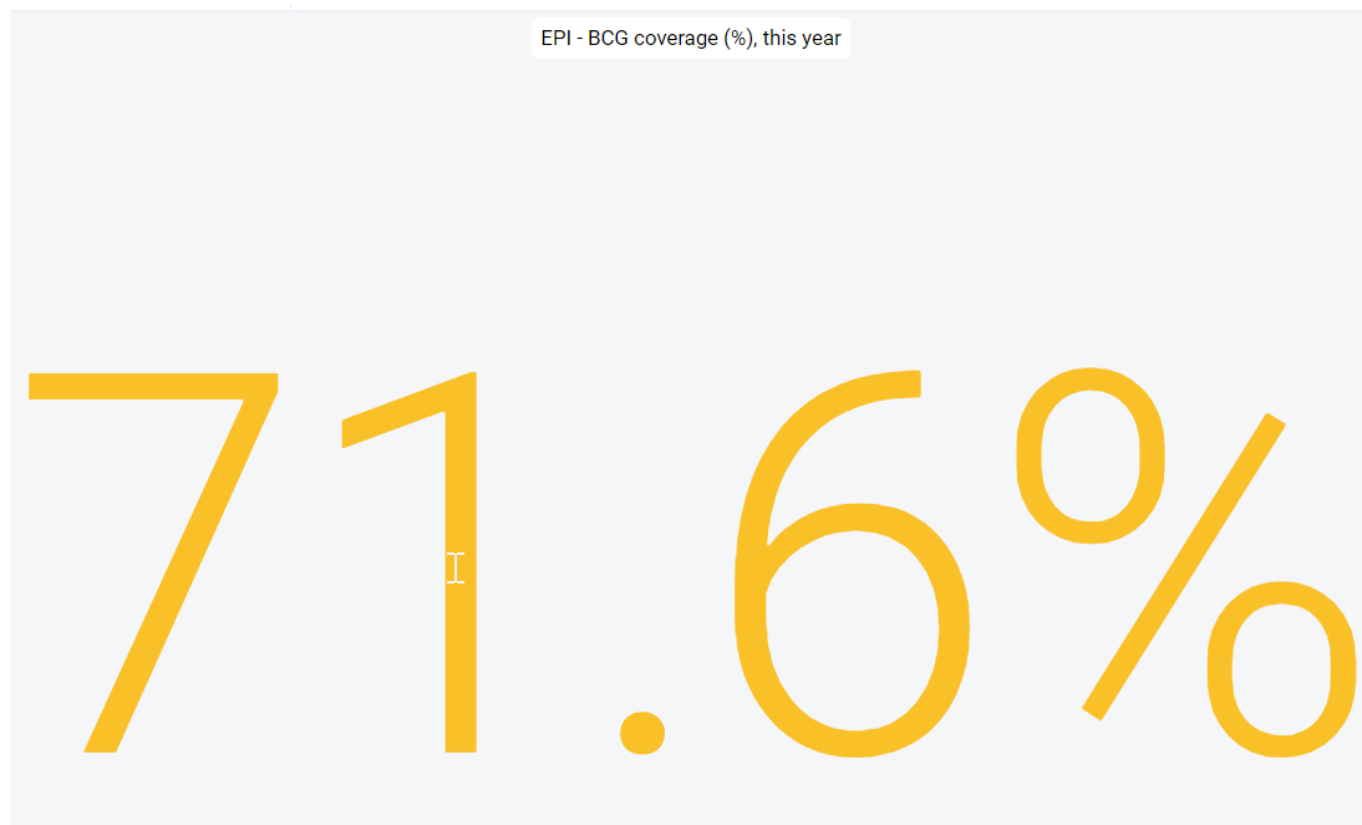
Review the chart "EPI - Routine coverage (%), this year"

This chart shows us coverage rates, but applies the principles of annualisation. Numerators for the indicators on display are taken from data entered in DHIS2 on a monthly basis, however the denominators are yearly population estimates. In this scenario, the numerator is being multiplied by a factor of 12 such that the annualised output can be displayed month-to-month.



Review the chart BCG coverage (%), this year

This is annualised as we have discussed, but the numerator for this indicator is actually using the attribute category for results directly in its formula.



Remember, the immunization data is divided into targets and results (you can review in data entry again if needed); so if we make an indicator and do not include our attribute category in our numerator, the indicator is going to give us a value including the targets + results; which would give us an incorrect value.

**Design for Data Use**

**Data Entry ?**

Organisation Unit: 0001 CH Mahosot

Data Set: Immunization

Period: August 2023

Donors: [ Select option ]

Donor 1

Donor 2

Lao PDR

- 01 Vientiane Capital
  - 0101 Chanthabouli
    - 0001 CH Mahosot
    - 0002 CH Mittaphap
    - 0101 DH Chanthabouli
    - PPM Chanthabouli
  - 0102 Sikhottabong
  - 0103 Xaisettha
  - 0104 Sisattanak
  - 0105 Naxaythong
  - 0106 Xaithani
  - 0107 Hatxayfong
  - 0108 Sangthong
  - 0109 Pakngum
- 09 Xiangkhouang
- 10 Vientiane
- 11 Bolikhamxai
- 18 Xaisomboun

Create a new chart using indicator groups

We have already used indicator groups before to make an output using indicators. It is very useful to have this on hand so we can filter our indicators when we are searching for items. After we make our indicators, it is good practice that we place them in groups so we can find them more easily.

Create a new chart by selecting File -> New

## Chart Type

- Year over year (line)

## Data

- Data Type : Indicators
- Indicator group: Immunization - coverages
- Indicator Name: OPV3 Coverage

It is a lot easier selecting our items from such lists then navigating all data items, particularly if we are not familiar with the data collection or system set up in detail.

## Data

The screenshot shows a data selection interface. On the left, there is a search bar labeled 'Search by data item name'. Below it, the 'Data Type' is set to 'Indicators'. The 'Indicator group' is set to 'Immunization - coverages'. A list of indicators is displayed below these filters, including 'EPI - BCG coverage (%)', 'EPI - DPT-HepB-HIB 2 coverage (%)', 'EPI - DPT-HepB-Hib 1 coverage (%)', and 'EPI - DPT-HepB-Hib 3 coverage (%)'. On the right, a 'Selected Items' panel shows 'EPI - OPV 3 coverage (%)' as the selected item. Navigation buttons (arrows) are visible between the filter panel and the selected items panel.

## Organisation unit

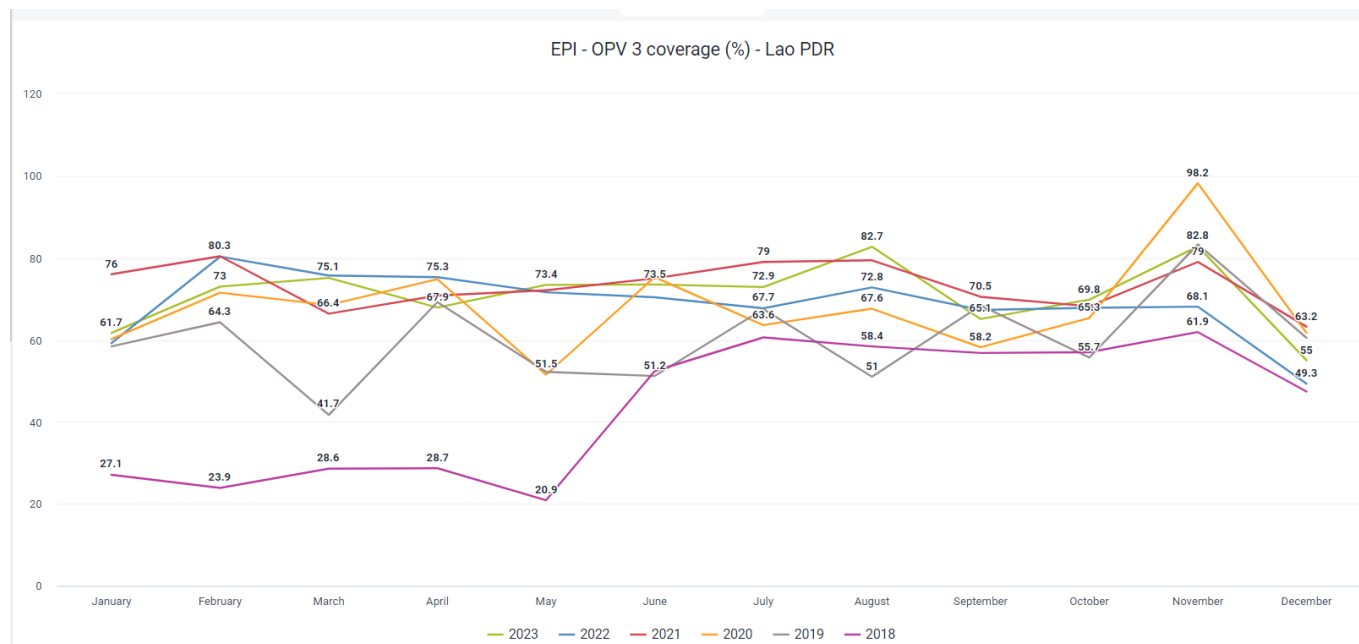
- Lao

## Series

- This year, last 5 years

## Category

- Months per year



## Exercise 2 - Create indicators in maintenance

### ***Perform this exercise in the CUSTOMIZATION system***

Navigate to Maintenance -> Indicators

You will be provided with a list of 6 modules

- Indicator: Used for creating the indicator itself
- Indicator type: For creating the multiplying factor
- Indicator group: For creating groups for indicators with similar characteristics
- Indicator group set: For creating groups of indicator groups

Program indicators and program indicator groups are for tracker and will not be covered here.

In this example, let us create an indicator for EPI - BCG coverage (%). The formula for this indicator is  $\text{EPI - BCG doses given} < 1 \text{ year} / \text{Live births} * 100\%$ . This information is taken from Immunization form section : Vaccine administration children.

**Lao PDR**

- 01 Vientiane Capital
  - 0101 Chanthabouli
    - 0001 CH Mahosot**
    - 0002 CH Mittaphap
    - 0101 DH Chanthabouli
    - PPM Chanthabouli
  - 0102 Sikhottabong
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- 09 Xiangkhouang
- 10 Vientiane
- 11 Bolikhamxai
- 18 Xaisomboun

Organisation Unit: 0001 CH Mahosot

Data Set: Immunization

Period: September 2023 Prev year Next year

Donors: Donor 1

Filter on section: Show all sections

### Outreach sessions

Filter in section	Value
Outreach immunization sessions held	1
Outreach immunization sessions planned	1



### Vaccine administration - children

Filter in section	<1 year	1+ year
BCG doses given	87	11
DPT-HepB-HIB 1 doses given	50	5
DPT-HepB-HIB 2 doses given	47	6
DPT-HepB-HIB 3 doses given	49	4
IPV doses given	52	1
OPV 0 doses given	1	
OPV 1 doses given	50	5
OPV 2 doses given	48	5

## Review indicator type creation

In order to create this indicator, we will need to make sure the factor of 100 is already there. If we navigate to factor, we will see that it is already there so we do not need to create (it is labelled as percentage with a factor of 100).

If we needed to create an indicator type, the process is very simple. Select the plus button to create the new indicator type then give it a name and factor.

 Indicator type 

Name (\*)

%

Factor (\*)

100

SAVE

CANCEL

## Create a new indicator

Now that we checked (or created) our indicator type, it is time to create our indicator. Navigate to the indicator in the maintenance app. This indicator (EPI - BCG Coverage %) is already available but we are going to create it for the sake of demonstration

Select the plus sign to create the indicator.

Give the indicator a name, short name, code and description. Here is the description

The estimated proportion of new students that have enrolled in a primary school within a given period

Also, use the Percentage indicator type, since we will be multiplying this indicator by a factor of 100.

Short name (\*)

SND\_BCG coverage (%)

Code

SND\_BCG\_COV|

Color

SELECT COLOR

Icon

ADD ICON

Description

Numerator: BCG doses given <1 yr  
Usually captured monthly  
  
Denominator: Live births  
Usually captured annually; alternative denominators may include 'live births' reported routinely from health facilities and/or community sources

☒ Annualized

Decimals in data output

1

Indicator type (\*)

Percentage

Scroll down to edit the numerator and denominator of the indicator

First the numerator

Edit numerator

Description

BCG doses given < 1 year

#(WY/r0Zx1M2..JKuab65bM4u)

( ) \* / + - Days  
If( isNull( isNotNull( firstNonNull( greatest( least( log(  
log10( .periodOffset(  
  
EPI - BCG doses given <1 year

Valid

DATA ELEMENTS

PROGRAMS

ORG UNIT COUNTS

CONSTANTS

REPORTING RATES

EPI - BCG doses given <1 year|

EPI BCG doses given <1 year

CANCEL DONE

Search for BCG doses given and select < 1 year.

Then the denominator

Edit denominator

Description

Live births

#(iKeyba85rv)

( ) \* / + - Days

if( isNull( isNotNull( firstNotNull( greatest( least( log(

log10( .periodOffset(

GEN - Population live births

Valid

DATA ELEMENTS   PROGRAMS   ORG UNIT COUNTS   CONSTANTS   REPORTING RATES

live

GEN - Population live births  
LSB: Births Live (Estimated)  
LSB: Births Live (Estimated) Male  
LSB: Births Live (Estimated) Female

CANCEL   DONE

Search for GEN - Pouplation Live births.

With this information selected, save the indicator. Note that you won't be able to use the indicator until the analytics process is run.

## Exercise 3 - Create an indicator using an attribute

### **Perform this exercise in the CUSTOMIZATION system**

Next, let us create the indicator for BCG Coverage <1 Donor 1 (%). This indicator has a couple unique propoerties

1. It is annualized
2. It uses an attribute category (Results) in its numerator

The formula for this indicator is

- Numerator : BCG doses given < 1, Donor
- Denominator : Total BCG doses given
- Factor/Indicator Type : Percentage (x100)

Navigate back to Maintenance -> Indicator and create a new indicator.

Give the indicator a name, short name, code and description. Here is the description

The estimated % of children < 1 Donor 1 that have been given a BCG vaccination

This indicator should be annualized so it can calculate monthly coverages using yearly population totals. Make sure this item is selected.

Also, use the Percentage indicator type, since we will be multiplying this indicator by a factor of 100.



SELECT COLOR

Icon

ADD ICON

Description

The estimated % of children < 1 Donor 1 have been given BCG Vaccination

☒ Annualized

Decimals in data output

Indicator type (\*)

Percentage

Legends

Search available/selected items

Average stockout days

Completeness and timeliness of reporting

Scroll down to edit the numerator and denominator of the indicator

First the numerator

Edit numerator

Description

EPI - BCG doses < 1 year given

#{WSy7z0Zx1wL.JKuWbG5bWau}

( ) \* / + - Days

if( isNull( isNotNull( firstNonNull( greatest( least( log(

log10( .periodOffset(

DATA ELEMENTS

PROGRAMS

ORG UNIT COUNTS

CO

BCG

EPI - BCG doses given <1 year

EPI - BCG doses given 1+ year

EPI - BCG doses given

EPI - BCG expired

EPI - BCG frozen

EPI - BCG issued

EPI - BCG missing

EPI - BCG opening balance

EPI - BCG received

EPI - BCG redistributed

EPI - BCG stock on hand

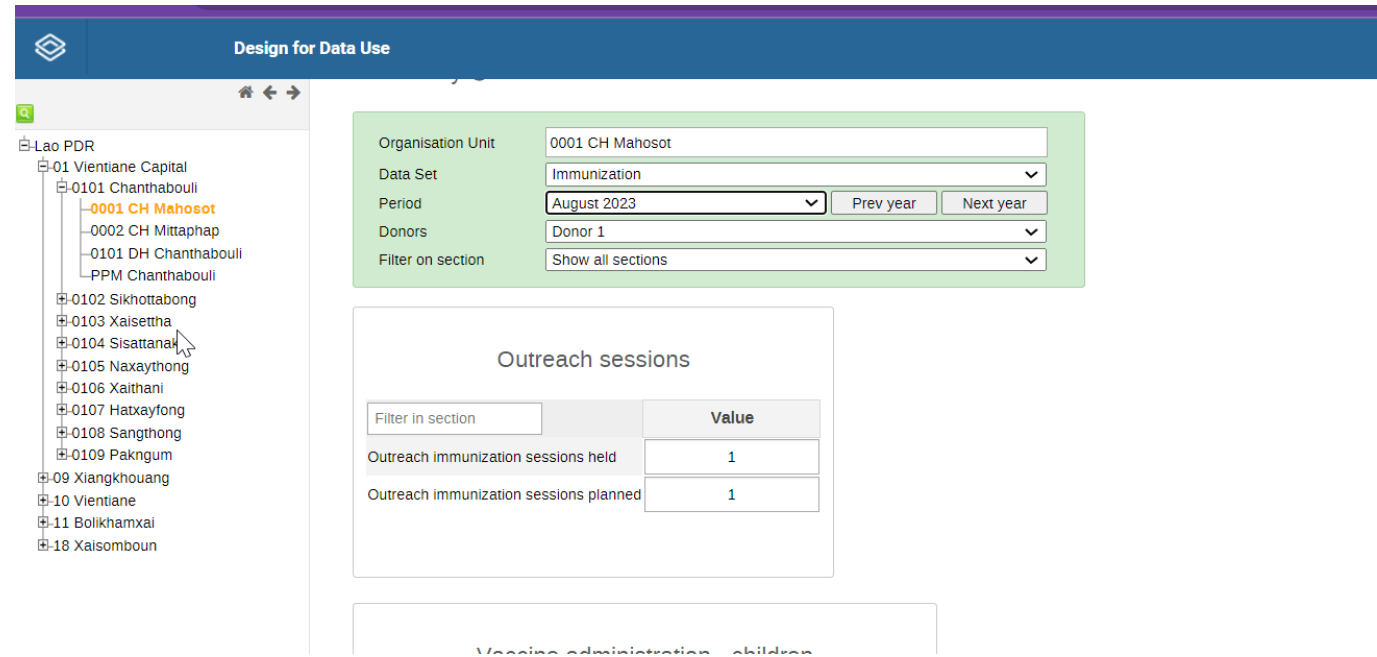
EPI - BCG stockout days

EPI - BCG doses given <1 year

Valid

Search for EPI - BCG doses given <1 year.

Do you see an issue with this at ths point in time?

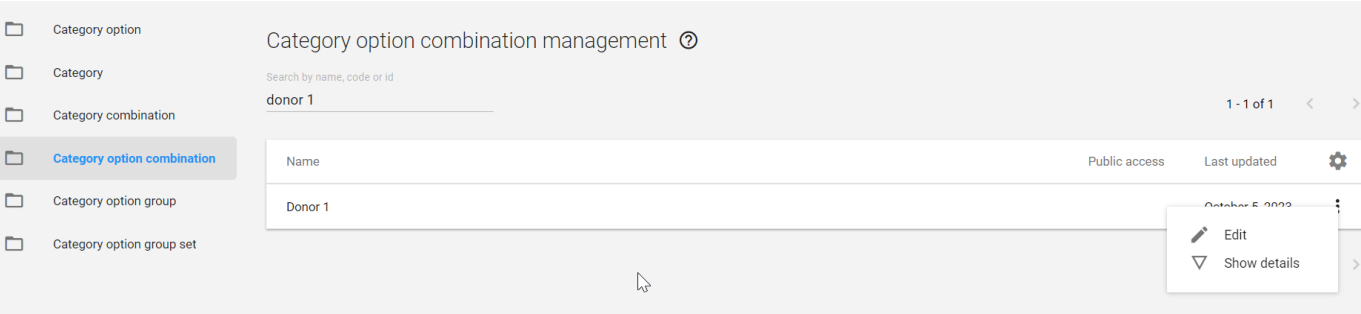


The immunization data set is seperated into Donor 1 and Donor 2. If we take the total for this data element without seperating it by these attribute categories, we will get the wrong value. We need to add in the attribute category to our numerator; but there is no option to review the attribute categories whe we are editing the indicator!


We can add this into our formula but it is a bit of a hidden feature. We need to find the id of the attribute category option combination, then we can add it into our indicator.

Search for the category option combination ID

**In a new tab (do not close the indicator tab)** navigate to Maintenance -> Category option combination, and search for results, select the action button and show details



You should be able to retrieve the ID of this item. Copy the ID and head back to your indicator tab.

**Short name** 

Donor 1

**Created**

Mon Nov 07 2022 20:32:37 GMT+0530  
(India Standard Time)

**Last updated**

Thu Oct 05 2023 11:26:11 GMT+0530  
(India Standard Time)

**Id**

KVd8G2OG9iN

**Api URL**

<https://dev.dhis2.world/ddu/api/29/categoryOptionCombos/KVd8G2OG9iN>

You now need to add the attribute category option combination to your numerator formula.

# Edit numerator

Description

EPI - BCG doses given <1 year Donor1

#{wSy7z0Zx1Wl.JKuWbG5bWAu.KVd8G20G9iN}

( ) \* / + - Days  
if( isNull( isNotNull( firstNonNull( greatest( least( log(  
log10( .periodOffset(

DATA ELEMENT

Search by name

District Popula  
District Popula  
District Popula  
District Popula  
District Popula  
District Popula  
District Popula  
District Popula  
District Popula  
District Popula  
District Popula  
District Popula

EPI - BCG doses given <1 year Donor 1

Valid

do this by adding a period after the disaggregate category combination id followed by the ID of the attribute category option combination.

You will see that the description at the bottom now shows "Donor 1" as it has recognized this ID in your formula.

Save the numerator.

Then edit the denominator

## Edit denominator

Description

EPI - BCG doses given

#{wSy7z0Zx1w1}

( ) \* / + - Days

if( isNull( isNotNull( firstNonNull( greatest( least( log(

log10( .periodOffset(

DATA ELEMENTS

PROGRAMS

EPI - BCG doses given

EPI - BCG doses given <1 year

EPI - BCG doses given 1+ year

EPI - BCG doses given

EPI - BCG doses given

Valid

Search for Total BCG doses given and add this to your denominator.

With this information selected, save the indicator. Note to the participants that you won't be able to use the indicator until the analytics process is run.

## Exercise 4 - Working with logical expressions

Create the indicator "MAL - Inpatient cases decline(%)." This is already available but we are going to create it for the sake of practice.

Select the plus sign to create the indicator.

Give the indicator a name, short name, code and description. Here is the description

"Decline in inpatient malaria cases expressed as "cases reported in the previous period minus cases reported in the current period divided by cases reported in the previous period" within a given period"

Also, use the Percentage indicator type, since we will be multiplying this indicator by a factor of 100.

Name (\*)

OP\_Inpatient cases decline(%)

Short name (\*)

OP\_Inpatient cases decline(%)

Code

OP\_ADMISSION\_DECLINE\_%

Color

SELECT COLOR

Icon

ADD ICON

Description

Decline in inpatient malaria cases expressed as “cases reported in the previous period minus cases reported in the current period divided by cases reported in the previous period” within a given period

☐ Annualized

Decimals in data output

Indicator type (\*)

Percentage

⊕

↺

Scroll down to edit the numerator and denominator of the indicator

First the numerator

The numerator description should be “Inpatient malaria cases previous period - Inpatient malaria cases current period”

## Edit numerator

Description
Inpatient malaria cases previous period - Inpatient malaria cases current period

```
(#{v0WZQQ6gKAX}.periodOffset(-1)- #{v0WZQQ6gKAX})
```

( ) \* / + - Days
if( isNull( isNotNull( firstNonNull( greatest( least( log(
log10( .periodOffset(

DATA ELEMENTS
PROGRAMS
MAL - Inpatient malaria cases
MAL - Inpatient malaria cases
MAL - Inpatient malaria cases 0-4 years
MAL - Inpatient malaria cases 5-14 years
MAL - Inpatient malaria cases 15+ years
MAL - Inpatient malaria cases (pregnant women)

(MAL - Inpatient malaria cases.periodOffset(-1)- MAL - Inpatient malaria cases)
Valid

Search for "MAL - Inpatient malaria cases", select the total without the category option Combinations, click the .periodOffset( and append to the data element expression with a factor of -1. This will be the expression for "Inpatient malaria cases previous period".

Add a minus sign after the expression and again search for "MAL - Inpatient malaria cases", select the total without the category option Combinations, don't add the periodOffset

Then the denominator

The denominator description should be "Inpatient malaria cases previous period"

## Edit denominator

DATA ELEMENTS	PROGRAMS
<p>Description</p> <p>Inpatient malaria cases previous period</p> <pre>#{v0WZQQ6gKAX}.periodOffset(-1)</pre> <p>( ) * / + - Days</p> <p>if( isNull( isNotNull( firstNonNull( greatest( least( log(</p> <p>log10( .periodOffset(</p>	<p>MAL - Inpatient malaria cases</p> <p>MAL - Inpatient malaria cases</p> <p>MAL - Inpatient malaria cases 0-4 years</p> <p>MAL - Inpatient malaria cases 5-14 years</p> <p>MAL - Inpatient malaria cases 15+ years</p> <p>MAL - Inpatient malaria cases (pregnant women)</p>

MAL - Inpatient malaria cases.periodOffset(-1)

Valid

Search for "MAL - Inpatient malaria cases", select the total without the category option Combinations, click the .periodOffset and append to the data element expression with a factor of -1. This will be the expression for "Inpatient malaria cases previous period".

With this information selected, save the indicator. Note that you won't be able to use the indicator until the analytics process is run.

## Exercise 5 - Review the process of creating indicator groups

### **Perform this exercise in the CUSTOMIZATION system**

Navigate to Maintenance -> Indicator -> Indicator group

1. Click the add button.
2. Type in name of the indicator group
3. Select and assign all required indicators
4. Select the save button

Now that the indicator group has been created, users can now easily retrieve a list of assigned indicators to the above group just by selecting the group rather than going through the entire list of indicators to look for the specific indicators.

Wait for the instructor to run analytics

Then you can go to data visualizer or maps and test the indicators you have created.