

# 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

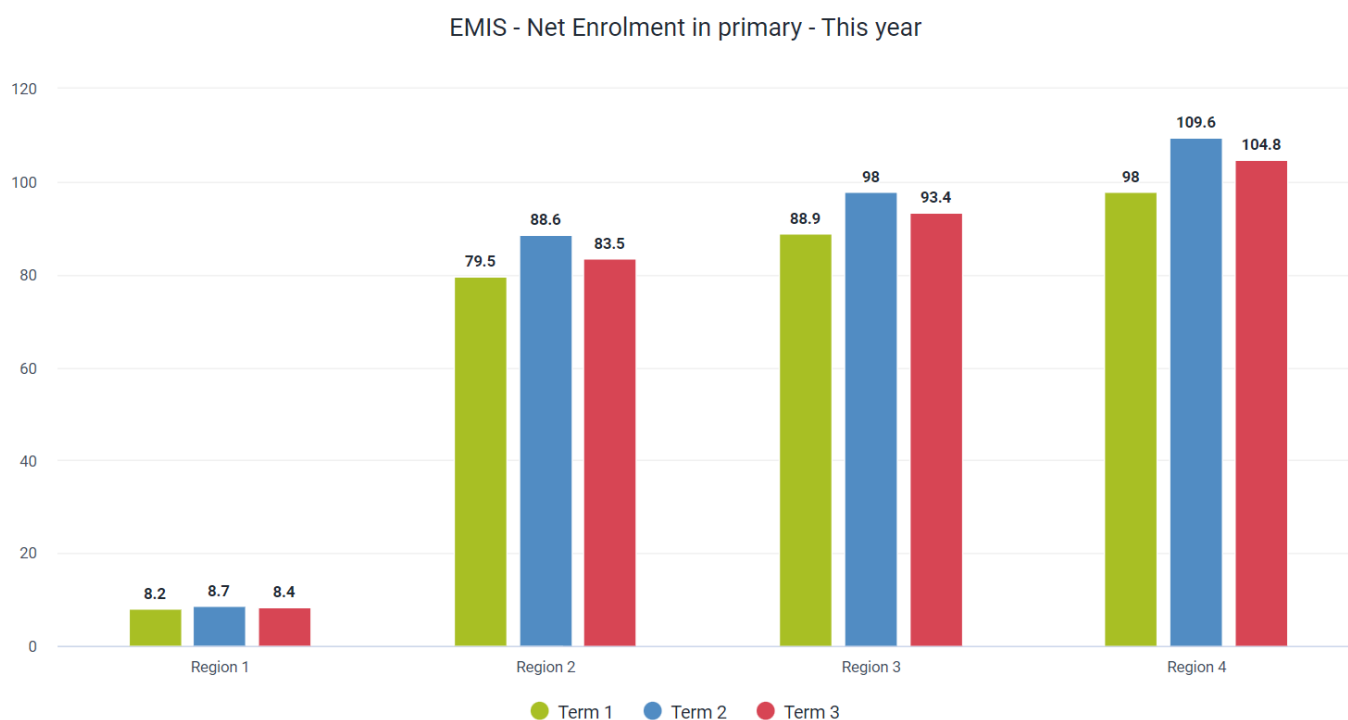
1. Define indicators in DHIS2
2. Create outputs using indicators and indicator groups
3. Create indicators in the maintenance app
4. Create indicator groups and group sets in the maintenance app
5. Describe the relationship between indicators and analytics

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

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

Review the chart "EMIS - Net Enrollment in Primary, this year" in data visualizer.

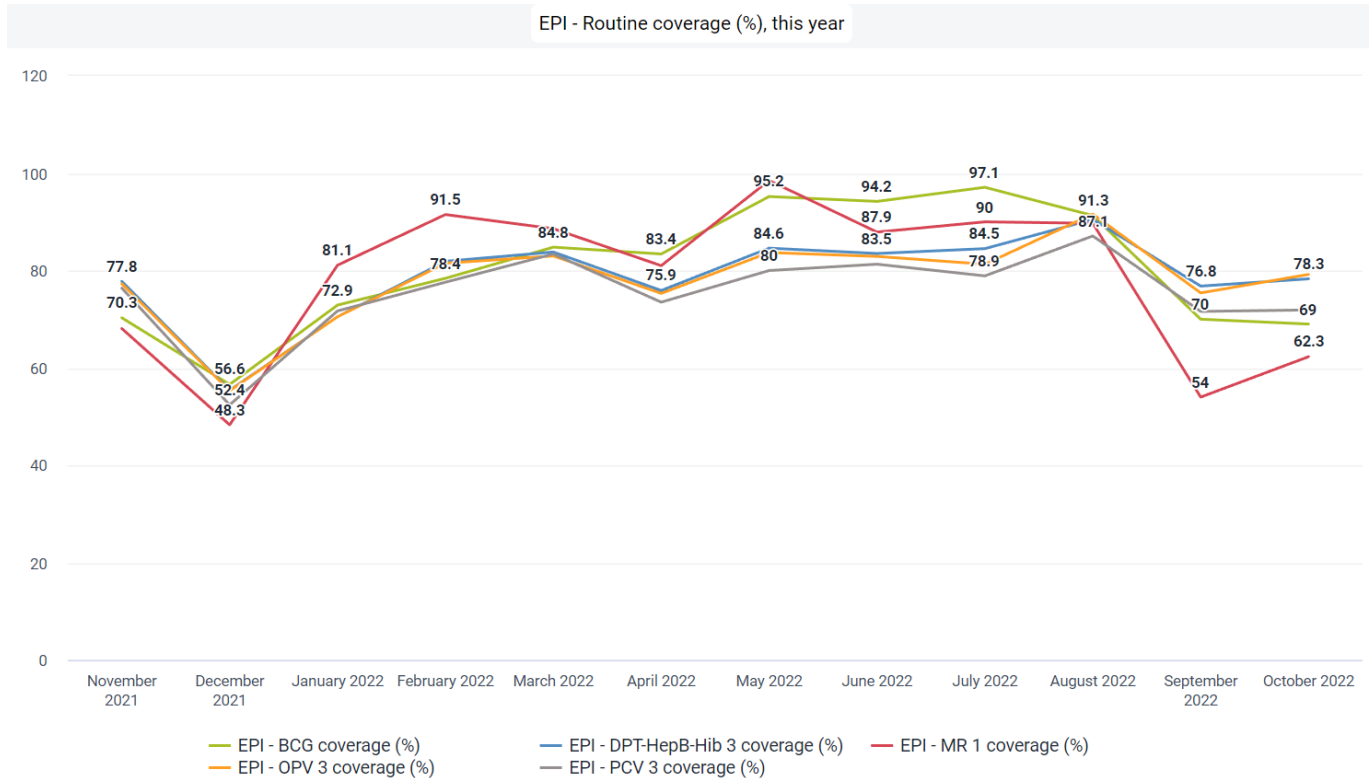
This indicator consists of the number of total net enrollments of children aged 6-12 divided by the number of total estimated children 6-12. It is further separated by the attribute category school term.



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

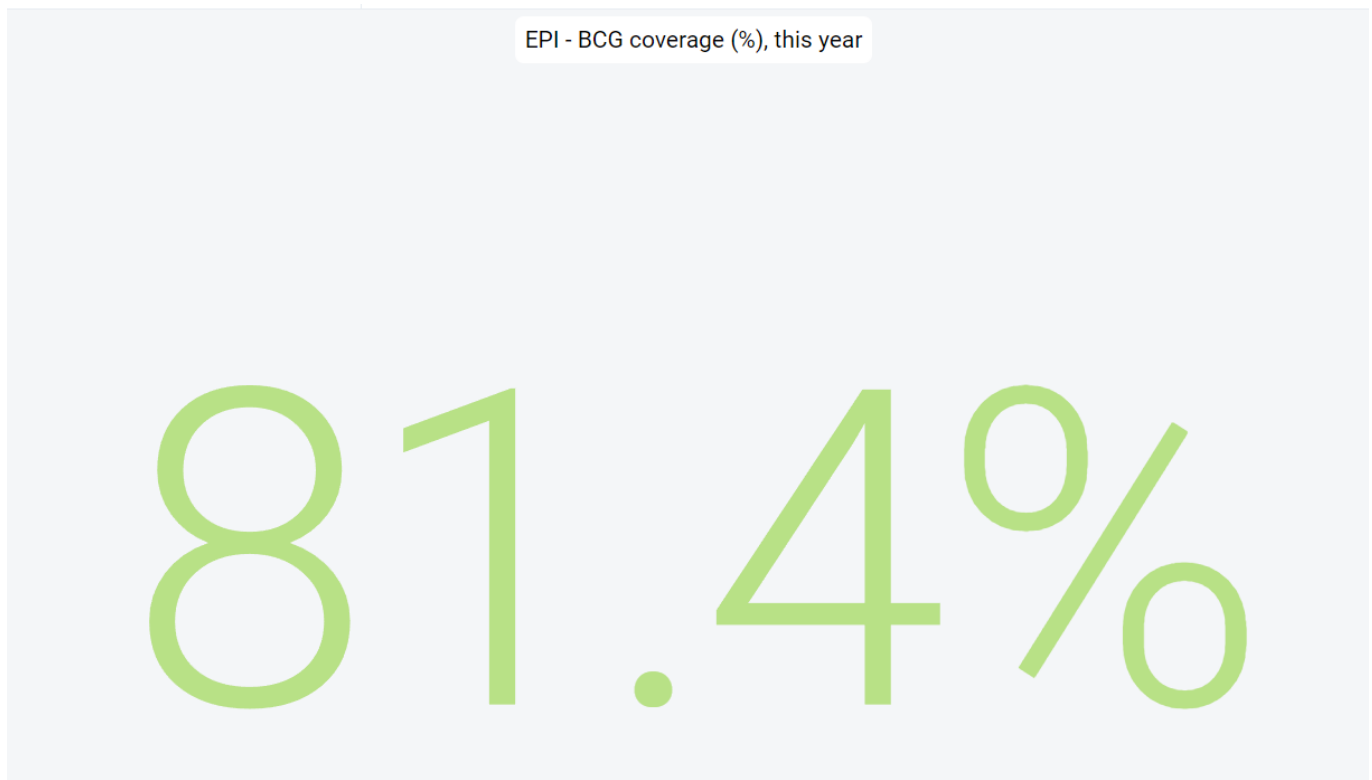
This chart shows us coverage rates, but applies the principles of annualisation. Numerators for the indicators on display are taken from data entered in DHIS2 on a monthly basis, however the denominators

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.



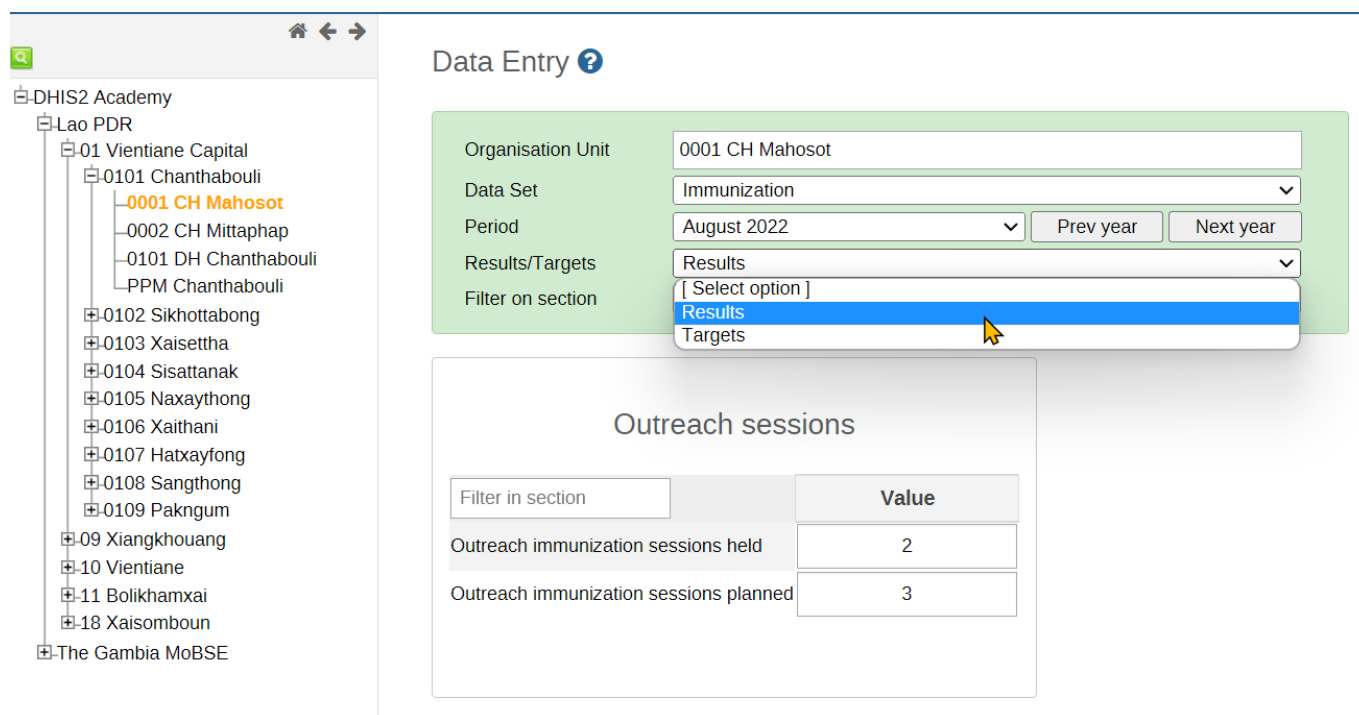
### Review the chart BCG coverage (%), this year

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.



**Data Entry**

Organisation Unit: 0001 CH Mahosot

Data Set: Immunization

Period: August 2022 [Prev year] [Next year]

Results/Targets: Results

Filter on section: [ Select option ]

**Outreach sessions**

Filter in section	Value
Outreach immunization sessions held	2
Outreach immunization sessions planned	3

## 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 than navigating all data items, particularly if we are not familiar with the data collection or system set up in detail.

## Data

Data Type

Indicators

Indicator group

Immunization - coverages

√<sub>0</sub> EPI - BCG coverage (%)

√<sub>0</sub> EPI - DPT-HepB-HIB 2 coverage (%)

√<sub>0</sub> EPI - DPT-HepB-Hib 1 coverage (%)

√<sub>0</sub> EPI - DPT-HepB-Hib 3 coverage (%)

→

→

←

Selected Items

√<sub>0</sub> EPI - OPV 3 coverage (%)

## Organisation unit

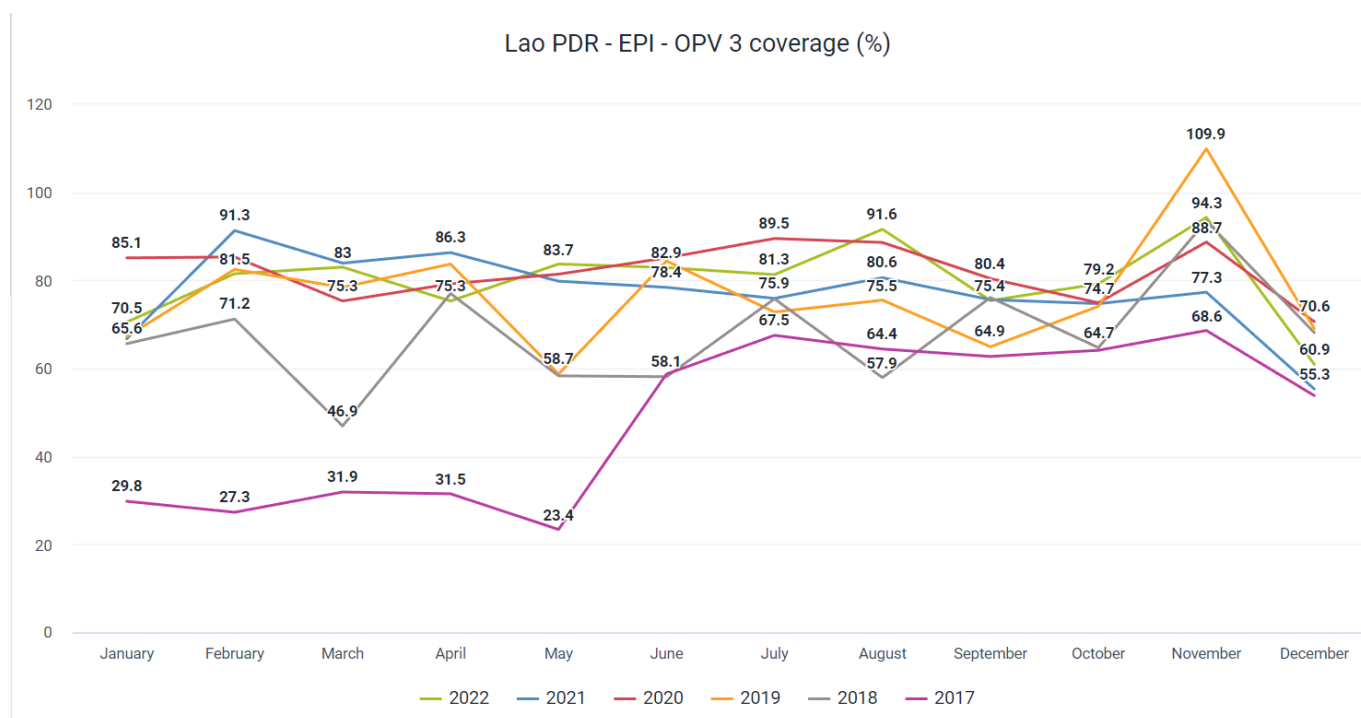
- Lao

## 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 Net enrolment in primary. The formula for this indicator is Learners enrolled from 6-12 years old/Estimate of children 6-12 years old \* 100%. This information is taken from section B in the termly tool.

## B: LEARNERS' INFORMATION

SECTION B: Learner Enrolment in the Reporting Term							
B1	P1		P2		P3		
	M	F	M	F	M	F	
< 6 years	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
6 years	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
7 years	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
8 years	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
9 years	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
10 years	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
11 years	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
12 years	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
13 years and above	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total	0	0	0	0	0	0	0

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-creation]

## Create a new indicator

Now that we checked (or created) our indicator type, it is time to create our indicator. Navigate to indicator in the maintenance app. This indicator (Net enrolment in primary) 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.



This object will be created with public edit and view rights

Name (\*)

SND\_Net enrolment in primary

Short name (\*)

SND\_Net enrolment in primary

Code

SND|net-enrollment

Color

SELECT COLOR

Icon

ADD ICON

Description

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

Edit numerator

Description

Total enrolment in primary

#{ezvKy89B1wT}+#{TPhHF3z95L2}+#{IkA1IbZgQCB}+#{LJmP7dqNaJQ}+#{cXrJ5Cz6QU4}+#{NXwINzahNVBU}+#{QybsnNTaEyr}

( ) \* / + - Days

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

log10( .periodOffset(

DATA ELEMENTS

PROGRAMS

ORG UNIT COUNTS

CONSTANTS

REPO

TT\_B\_learner enrolment|

TT\_B\_Learner enrolment 10 years

TT\_B\_Learner enrolment 10 years P1, Male

TT\_B\_Learner enrolment 10 years P1, Female

TT\_B\_Learner enrolment 10 years P2, Male

TT\_B\_Learner enrolment 10 years P2, Female

TT\_B\_Learner enrolment 10 years P3, Male

TT\_B\_Learner enrolment 10 years P3, Female

TT\_B\_Learner enrolment 10 years P4, Male

TT\_B\_Learner enrolment 10 years P4, Female

TT\_B\_Learner enrolment 10 years P5, Male

TT\_B\_Learner enrolment 10 years P5, Female

TT\_B\_Learner enrolment 10 years P6, Male

TT\_B\_Learner enrolment 6 years+TT\_B\_Learner enrolment 7 years+TT\_B\_Learner enrolment 8 years+TT\_B\_Learner enrolment 9 years+TT\_B\_Learner enrolment 10 years+TT\_B\_Learner enrolment 11 years+TT\_B\_Learner enrolment 12 years

Search for TT\_B\_Learner enrolment (termly tool section B) and add up the totals from ages 6 years to 12 years.

Then the denominator

Edit denominator

Description

Children aged 6-12 years

#{VJRF5cLyg3i}

( ) \* / + - Days

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

log10( .periodOffset(

DATA ELEMENTS

PROGRAMS

ORG UNIT COUNTS

District population|

District Population: Children aged 3-5 years

District Population: Children aged 3-5 years Male

District Population: Children aged 3-5 years Female

District Population: Children aged 3 years

District Population: Children aged 3 years Male

District Population: Children aged 3 years Female

District Population: Children aged 6-12 years

District Population: Children aged 6-12 years Male

District Population: Children aged 6-12 years Female

District Population: Children aged 6 years

District Population: Children aged 6 years Male

District Population: Children aged 6 years Female

District Population: Children aged 6-12 years

Search for District population, you want children aged 6-12 years.

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 (%). This indicator has a couple unique properties

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, Result
- Denominator : Estimated live births
- 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 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.



This object will be created with public edit and view rights

Name (\*)

SND\_BCG Coverage < 1

Short name (\*)

SND\_BCG Coverage < 1

Code

SND\_BCG\_Coverage

Color

SELECT COLOR

Icon

ADD ICON

Description

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



Annualized

Decimals in data output

Indicator type (\*)

Percentage

Scroll down to edit the numerator and denominator of the indicator

First the numerator

Edit numerator

Description

EPI - BCG doses given <1 year

#{wSy7z0Zx1w1.JKuwbG5bWau}

( ) \* / + - Days

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

log10( .periodOffset(

DATA ELEMENTS

PROGRAMS

ORG UNIT COUNTS

CONSTANTS

REP

EPI - BCG doses given <1 year

EPI - BCG doses given <1 year

EPI - BCG doses given <1 year

Search for EPI - BCG doses given <1 year.

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

🏠 ⬅ ➡

🔍

DHIS2 Academy

- 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
- The Gambia MoBSE
  - Region 1
    - Banjul

Data Entry ?

Organisation Unit

0001 CH Mahosot

Data Set

Immunization

Period

August 2022

Prev year

Next year

Results/Targets

Results

Filter on section

Show all sections

Outreach sessions

Filter in section

Value

Outreach immunization sessions held

2

Outreach immunization sessions planned

3

The immunization data set is seperated into results and targets. 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

Category option combination management ?

Search by name, code or id

results 1 - 1 of 1 < >

Name	Public access	Last updated	
Results		November 7, 2022	<div><div>Edit</div><div>Show details</div></div>

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

## Short name



Results

## Created

Mon Nov 07 2022 20:32:37 GMT-0500  
(Eastern Standard Time)

## Last updated

Mon Nov 07 2022 20:32:37 GMT-0500  
(Eastern Standard Time)

## Id

KVd8G2OG9iN

## Api URL

<https://academy.dev.dhis2.org/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

#{WSy7z0Zx1Wl.JKuWbG5bWAu.KVd8G20G9iN}

( ) \* / + - Days

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

log10( .periodOffset(

DATA ELEMENTS

PROGRAMS

C

EPI - BCG doses given <1 year

EPI - BCG doses given <1 year

EPI - BCG doses given &lt;1 year Results

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 "Results" as it has recognized this ID in your formula.

Save the numerator.

Then edit the denominator

## Edit denominator

Description  
Population live births

```
# {iKxybad85rv}
```

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

DATA ELEMENTS PROGRAMS

live births

GEN - Population live births

GEN - Population live births

Valid

Search for live births 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

Description

Inpatient malaria cases previous period

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

( ) \* / + - 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)

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.