

Learner's guide to Creating Program Indicators

PERFORM THESE EXERCISES on the INDICATOR SYSTEM

Use your initials when making an indicator

What is this guide?

This guide contains all ungraded exercises and detailed steps to perform them related to program access levels for the Tracker Config Level 1 academy. Please perform each of the exercises when prompted to by your instructors

Learning objectives for this session

By the end of this session, users should be familiar with the basics in creating program indicators within DHIS2. Users should also be aware of how program indicators can be combined with aggregate data elements to create combined indicators. There are several concepts that the participant should be familiar with by the end of this session:

1. Describe the concept of a program indicator
2. Describe the individual components that are part of a program indicator
 1. Aggregation type
 2. Analytics type
 3. Expression
 4. Filter
3. Create program indicators in DHIS2
4. Create combined indicators in DHIS2

Guided Exercise Overview

Exercise 1

Program: TB Treatment Card

Indicator: Extra-Pulmonary TB

Short name: EPTB

Aggregation Type : Count

Analytics Type : Event

Exercise 2

Program: TB Treatment Card

Indicator: New, Pulmonary TB cases

Short name: NPTB

Aggregation Type : Count

Analytics Type : Event

Exercise 3

Program: TB Treatment Card

Indicator: TO - failure or died

Short name: TO - failure or died

Aggregation Type : Count

Analytics Type : Event

Create a copy of this indicator with the same characteristics, but filter out Sex = Male, Age > 60

Exercise 4

Program: TB Treatment Card

Indicator: Hospitalized - Initial and Continuation

Short name: All Treatment Hospitalized

Code: AT_HOSP

Aggregation Type : Count

Analytics Type : Enrollment

Exercise 5

Program: TB Treatment Card

Indicator: Weight Change

Short name: Weight Change

Code: TB_WC

Aggregation Type : Average

Analytics Type : Enrollment

Create a program indicator of enrollment type. This should calculate the difference in weight between the Initial Diagnosis and End of Treatment program stages when the culture result is negative and the treatment outcome is either cured or completed.

Exercise 6

Combined indicator

Program: TB Treatment Card

Indicator: TB incidence rate per 100,000

Numerator: TB new cases

Denominator: Population Total

Exercise 1 - Indicator 1 : EPTB Cases

Conceptualize the indicator

We want to COUNT the number of extra-pulmonary TB cases. This is taken from the field disease site, which has an option set where I can select this value.

Disease Site

TB Disease Site

Select or search from the list

Search...

Pulmonary

Extra-Pulmonary

Type of Treatment for Initial Phase

Select or search from the list

Search...

Type of Treatment

Select or search from the list

Search...

Edit the indicator details

Navigate to Maintenance -> Indicator-> Program Indicator

Select "TB Treatment Card" as the program

- Indicator
- Indicator type
- Indicator group
- Indicator group set
- Program indicator**
- Program indicator group

Program indicator

Search by name, code or id

Program

TB Treatment Card

| | |
|---------------------------------|----|
| Name | P |
| Weight Change (Final - Initial) | TI |

Add a new indicator and edit the program indicator details

Select the blue plus sign to add a new indicator.

First, edit the name, short name and code details.



This object will be created with public edit and view rights

Program (*)

TB Treatment Card

Name (*)

Extra-Pulmonary TB

Short name (*)

EBTB

Code

EBTB

Skip color and icon

Next, add a description.

Review the aggregation type, what are we trying to do with this indicator? We want to COUNT the number of cases that are EPTB.

Review the analytics type. We only need data from one stage in the program, and this stage is not repeated. In this scenario, the analytics type is EVENT.

After selecting the analytics type, you will see "Analytics period boundaries." Leave these all as default, we will not cover them in this academy. You can learn more about them in the [docs](#).

Description

The number of EPTB cases within the TB program

Decimals in data output

Aggregation type

Count

Analytics type (*)

Event

Analytics period boundaries

Boundary target

Event date

Analytics period boundary type

After start of reporting period

Offset period by amount

Period type

REMOVE

Boundary target

Event date

Analytics period boundary type

Before end of reporting period

Offset period by amount

Period type

REMOVE

ADD NEW BOUNDARY

☐ Display in form

Edit the expression


Select the expression tab in order to edit the expression. This is where we define what we want to happen mathematically.

When you create a program indicator in a tracker program, you will see all of the program stages located on the right side menu. From here, you can select any of the data elements belonging to those stages. You will also be able to select the attributes that belong to the program. In addition, we also have variables and constants that we can use in our calculations.


In this case, we can use a simple variable, called event count, to define our expression. This is because we want to count the number of events that meet a certain criteria. This is a variable you will likely find yourself using quite often.

- ▶ Continuation 1
- ▶ Continuation 2
- ▶ End of Treatment
- ▶ Initial Diagnosis
- ▶ Attributes
- ▼ Variables
 - Completed date
 - Creation date
 - Current date
 - Due date
 - Enrollment count
 - Enrollment Date
 - Enrollment status
 - Event count
 - Event date

Select the filter tab in order to edit the filter. Here we define what criteria we want to include in our mathematical calculation. We want to count events, but which ones? In our case, those where the disease site is extra pulmonary.

 The filter is applied to events and filters the data source used for the calculation of the indicator. The filter must evaluate to either true or false. Use single quotes for text values. Use option codes for option set references. Tip: use `d2:condition('bool-expr',true-val,false-val)` `d2:daysBetween(date,date)` `d2:zing(x)` `d2:oizp(x)`

```
#{JBm6bPc1v4Y.eos8eEb6z4g}
```

- Continuation 1
- Continuation 2
- End of Treatment
- Initial Diagnosis
 - TBTC|TB Patient Type
 - TBTC|TB Disease Site 
 - TBTC|EPTB Site
 - TBTC|Type of Treatment
 - TBTC|Sputum Smear Re
 - TBTC|...

In program indicators, options are identified via their code within an option set. In this example, the name and the code are the same, but if you are not familiar with the metadata, it is usually a good idea to check the code of the option you are using.

Edit option

Name (*)

Extra-Pulmonary

Code (*)

Extra-Pulmonary

Copy the code and add it into the filter. We add it in between quotes as it is a text value. All text values need to be in-between quotes.



The filter is applied to events and filters the data source used for the calculation of the indicator. The filter must evaluate to either true or false. Use single quotes for text values. Use option codes for option set references. Tip: use d2:condition('bool-expr',true-val,false-val) d2:daysBetween(date,date) d2:zing(x) d2:oizp(x)

```
#{JBm6bPclv4Y.eos8eEb6z4g} == 'Extra-Pulmonary'
```

Test the program indicator

Now that you have created the program indicator, it is a good idea to test if it is functional. You can compare the properly configured indicator with the one you have created to ensure that the value is correct. In order to do this you can navigate to the pivot table app.

Navigate to the data visualizer app

Create a new pivot table with the following details

- Data : the program indicator you made, the program indicator "Extra Pulmonary TB"
- Period : This year
- Organisation Unit : Trainingland

Click on update to verify that the values are equal in the indicators. This will provide some validation that the indicator is created correctly.

| Trainingland | | |
|--------------|--------------------|-----------------------|
| | Extra Pulmonary TB | KT_Extra Pulmonary TB |
| 2023 | 27 | 27 |

Exercise 2 - Indicator 2 : New, Pulmonary TB Cases

Conceptualize the indicator

We want to COUNT the number of New, Pulmonary TB cases

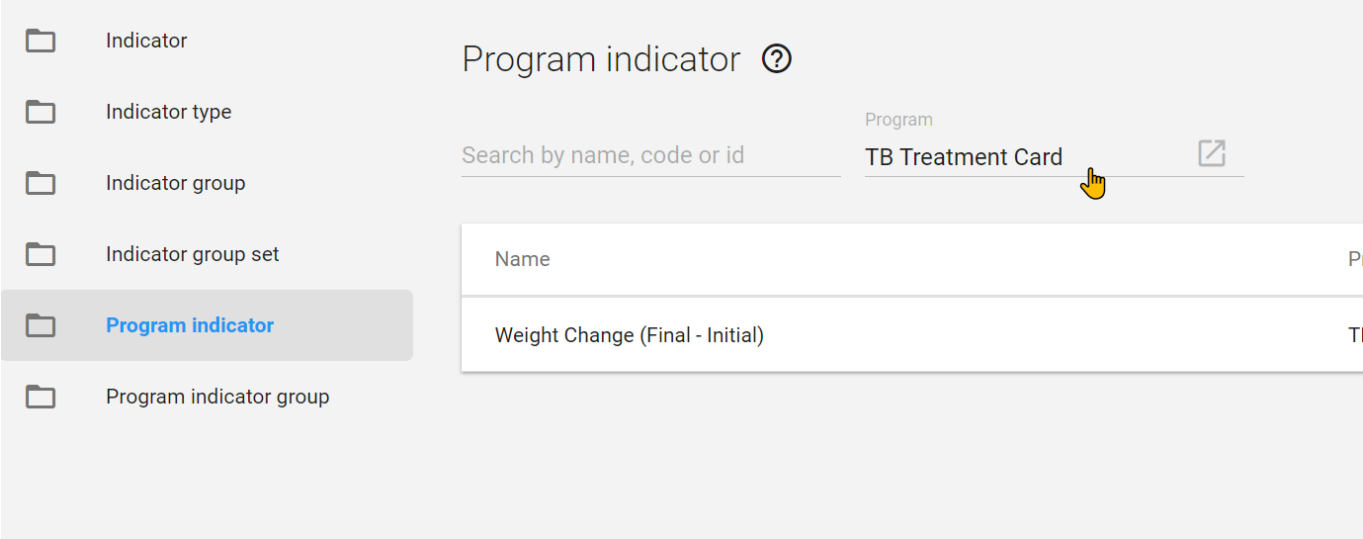
| Type of Patient | |
|-----------------|-----------|
| TB Patient Type | New |
| Disease Site | |
| TB Disease Site | Pulmonary |

These values are taken from 2 different data elements, TB Patient Type and TB Disease Site, both with option set values to select from. This means that we will need to consider the codes of these values again.

Edit the indicator details

Navigate to maintenance -> Indicator-> Program Indicator

Select "TB Treatment Card" as the program



Add a new indicator and edit the program indicator details

Select the blue plus sign to add a new indicator.

First, edit the name, short name and code details.

Program (*)

TB Treatment Card

Name (*)

New, Pulmonary TB

Short name (*)

New PTB

Code

NPTB

Skip color and icon

Next, add a description.

Review the aggregation type, what are we trying to do with this indicator? We want to COUNT the number of cases that are EPTB.

Review the analytics type. We only need data from one stage in the program, and this stage is not repeated. In this scenario, the analytics type is EVENT.

After selecting the analytics type, you will see "Analytics period boundaries." Leave these all as default, we will not cover them in this academy. You can learn more about them in the [docs](#).

Description

The number of new, pulmonary TB cases within the TB program

Decimals in data output

Aggregation type

Count

Analytics type (*)

Event

Analytics period boundaries

Boundary target

Event date

REMOVE

Analytics period boundary type

After start of reporting period

Offset period by amount

Period type

Boundary target

Event date

REMOVE

Analytics period boundary type

Before end of reporting period

Offset period by amount

Period type

ADD NEW BOUNDARY

Edit the expression

Select the expression tab in order to edit the expression. This is where we define what we want to happen mathematically.

In this case, we can use a simple variable, called event count, to define our expression. This is because we want to count the number of events that meet a certain criteria. This is a variable you will likely find yourself using quite often.

Event date

Copy the code and add it into the filter. We add it in between quotes as it is a text value. All text values need to be in-between quotes.



The filter is applied to events and filters the data source used for the calculation of the indicator. The filter must evaluate to either true or false. Use single quotes for text values. Use option codes for option set references. Tip: use d2:condition('bool-expr',true-val,false-val) d2:daysBetween(date,date) d2:zing(x) d2:oizp(x)

```
#{JBm6bPc1v4Y.Ap6BGeopL7u} == 'New'|
```

In order for this indicator to meet our required criteria, the patient has to be new AND the disease site has to be pulmonary. We therefore must use the 'and' logical operator in this scenario. Select the disease site data element and complete the filter.

```
#{JBm6bPc1v4Y.Ap6BGeopL7u} == 'New' and #{JBm6bPc1v4Y.eos8eEb6z4g} == 'Pulmonary'
```

+ - * / %

> >= < <= == != NOT AND OR

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

log10(.periodOffset(



Initial Diagnosis\TBTC|TB Patient Type == 'New' and Initial
Diagnosis\TBTC|TB Disease Site == 'Pulmonary'

Test the program indicator

Now that you have created the program indicator, it is a good idea to test if it is functional. You can compare the properly configured indicator with the one you have created to ensure that the value is correct. In order to do this you can navigate to the pivot table app.

Navigate to the data visualizer app

Create a new pivot table with the following details

- Data : the program indicator you made, the program indicator "New, Pulmonary TB"
- Period : This year
- Organisation Unit : Trainingland

Click on update to verify that the values are equal in the indicators. This will provide some validation that the indicator is created correctly.

| Trainingland | | |
|--------------|----------------------------|-------------------------|
| | KT_New, Pulmonary TB | New, Pulmonary TB |
| 2023 | 1 695 | 1 695 |

Exercise 3 - Indicator 3 : Patients on who failed treatment or died

Conceptualize the indicator

We want to COUNT the number of cases that either died or treatment failed

Treatment Outcome

Treatment Outcome

Complete

Your note here

Add

Clear

Treatment failure

Search...

Cured

Treatment completed

Died

Treatment failure

Loss to follow-up

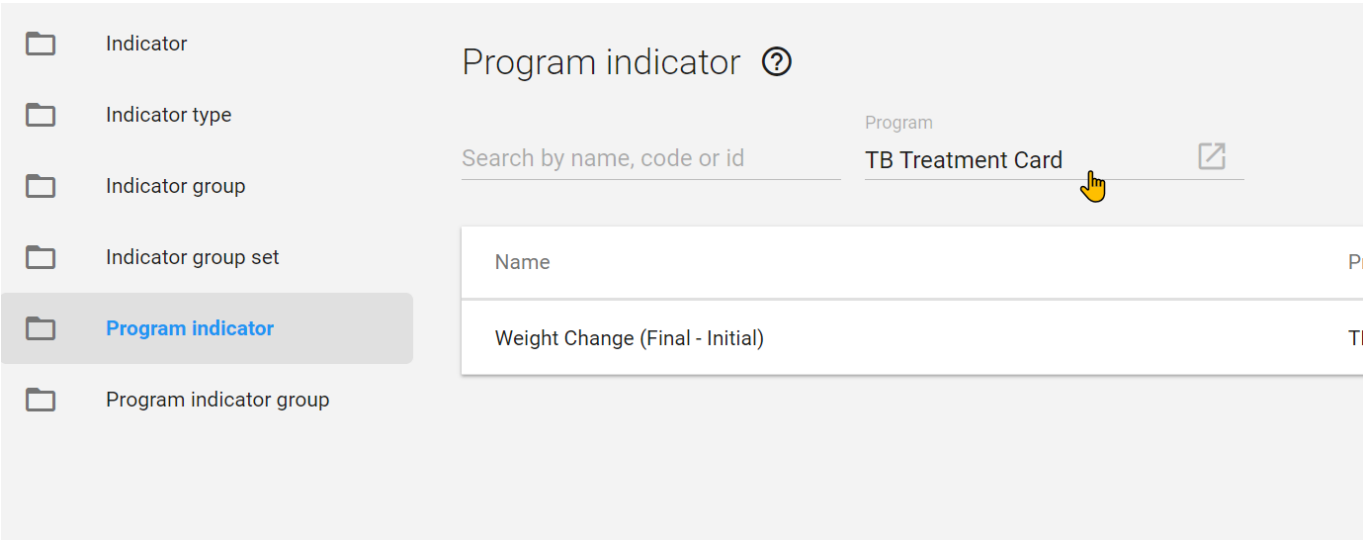
Not evaluated

These values are taken from 1 data element, Treatment Outcome, with option set values to select from. This means that we will need to consider the codes of these values again.

Edit the indicator details

Navigate to maintenance -> Indicator-> Program Indicator

Select "TB Treatment Card" as the program



Add a new indicator and edit the program indicator details

Select the blue plus sign to add a new indicator.

First, edit the name, short name and code details.

Program (*)

TB Treatment Card

Name (*)

Treatment outcome - failure or death

Short name (*)

TO - Failure or death

Code

TO_FAIL_OR_DIE

Skip color and icon

Next, add a description.

Review the aggregation type, what are we trying to do with this indicator? We want to COUNT the number of cases that are either on facility or community based DOT.

Review the analytics type. We only need data from one stage in the program, and this stage is not repeated. In this scenario, the analytics type is EVENT.

After selecting the analytics type, you will see "Analytics period boundaries." Leave these all as default, we will not cover them in this academy. You can learn more about them in the [docs](#).

Description

The number of TB cases whos treatment outcome was either failure or death

Decimals in data output

Aggregation type

Count

Analytics type (*)

Event

Analytics period boundaries

| | | | |
|------------------|---------------------------------|-------------------------|-------------|
| Boundary target | Analytics period boundary type | Offset period by amount | Period type |
| Event date | After start of reporting period | | |
| REMOVE | | | |
| Boundary target | Analytics period boundary type | Offset period by amount | Period type |
| Event date | Before end of reporting period | | |
| REMOVE | | | |
| ADD NEW BOUNDARY | | | |

Edit the expression

Select the expression tab in order to edit the expression. This is where we define what we want to happen mathematically.

In this case, we can use a simple variable, called event count, to define our expression. This is because we want to count the number of events that meet a certain criteria. This is a variable you will likely find yourself using quite often.

The expression defines how the indicator is calculated. Tip: use
d2:condition('bool-expr',true-val,false-val) d2:daysBetween(date,date)
d2:zing(x) d2:oizp(x)

```
V{event_count}
```

+ - * / %
> >= < <= == != NOT AND OR

Select the filter tab in order to edit the filter. Here we define what criteria we want to include in our mathematical calculation. We want to count events, but which ones? In our case, those where the treatment outcome is either treatment failure or died.

Next, we can use our operator 'equals to.'

Edit option Edit option

Edit option

Name (*)

Died

Code (*)

Died

17 / 41



The filter is applied to events and filters the data source used for the calculation of the indicator. The filter must evaluate to either true or false. Use single quotes for text values. Use option codes for option set references. Tip: use `d2:condition('bool-expr',true-val,false-val)` `d2:daysBetween(date,date)` `d2:zing(x)` `d2:oizp(x)`

```
#{iXw8SKe7k8i.VjK4J8h7dMF} == 'Treatment failure'|
```

In order for this indicator to meet our required criteria, the patient can be on facility based OR community based DOT. We therefore must use the 'or' logical operator in this scenario. Select the disease site data element and complete the filter.



The filter is applied to events and filters the data source used for the calculation of the indicator. The filter must evaluate to either true or false. Use single quotes for text values. Use option codes for option set references. Tip: use d2:condition('bool-expr',true-val,false-val) d2:daysBetween(date,date) d2:zing(x) d2:oizp(x)

```
#{iXw8SKe7k8i.VjK4J8h7dMF} == 'Treatment failure' or #
{iXw8SKe7k8i.VjK4J8h7dMF} == 'Died'
```

+

-

*

/

%

>

>=

<

<=

==

!=

NOT

AND

OR

if(

isNull(

isNotNull(

firstNonNull(

greatest(

least(

log(

log10(

.periodOffset(



End of Treatment\TBTC|Treatment Outcome == 'Treatment failure' or
End of Treatment\TBTC|Treatment Outcome == 'Died'

Test the program indicator

Now that you have created the program indicator, it is a good idea to test if it is functional. You can compare the properly configured indicator with the one you have created to ensure that the value is correct. In order to do this you can navigate to the pivot table app.

Navigate to the data visualizer app

Create a new pivot table with the following details

- Data : the program indicator you made, the program indicator "Treatment outcome - failure or death"
- Period : This year
- Organisation Unit : Trainingland





Click on update to verify that the values are equal in the indicators. This will provide some validation that the indicator is created correctly.

| Trainingland | | |
|--------------|---|--------------------------------------|
| | KT_Treatment outcome - failure or death | Treatment outcome - failure or death |
| 2023 | 37 | 37 |

Exercise 3 Part 2 - Adding more filters

What if we want to modify this indicator to only count those cases that were Male and >60?

In order to do this, we need to modify our indicator filter. As we are adding on to the previous indicator, let us find it and clone it.

| | | | |
|--|-------------------|------------------|---|
| SND_Treatment outcome - failure or death | TB Treatment Card | January 31, 2022 |  |
| | | |  Edit |
| Treatment outcome - failure or death | TB Tr | |  Clone |
| | | |  Sharing settings |

Update the name, short name, code and description

Program (*)

TB Treatment Card

Name (*)

Treatment outcome - failure or death (M, >60)

Short name (*)

TO - Failure or death (M, >60)

Code

TO_FAIL_OR_DIE_M_>60

Description

The number of male TB cases < 60 whos treatment outcome was either failure or death

Aggregation type and analytics type remain the same.

The expression is also the same. We do need to update our filter however.

```
(#{iXw8SKe7k8i.VjK4J8h7dMF} == 'Treatment failure' or #
{iXw8SKe7k8i.VjK4J8h7dMF} == 'Died') and A{tJnr3mrNs21} == 'MALE' and
A{CVYtEunMUU3} > 60
```

+

-

*

/

%

>

>=

<

<=

==

!=

NOT

AND

OR

if(

isNull(

isNotNull(

firstNonNull(

greatest(

least(

log(

log10(.periodOffset(



(End of Treatment\TBTC|Treatment Outcome == 'Treatment failure'
or End of Treatment\TBTC|Treatment Outcome == 'Died') and Sex ==
'MALE' and Age > 60

Let's review what's changed.

1. We introduced grouping by bracketing the or statement
2. We added two additional filters for age and sex using and statements

Note that if you are grouping multiple and/or conditions together to create a specific filter criteria, then you will need to use brackets. This acts as a sort of order of operations. Save the indicator after you have entered and explained the filter.

After we save this, we should be able to verify this indicator in data visualizer

| Trainingland | | |
|--------------|---|--|
| | KT_Treatment outcome - failure or death M 60+ | Treatment outcome - failure or death M 60+ |
| 2023 | 4 | 4 |

Create Enrollment Type Indicators

Exercise 4 - Indicator 4 : Patients hospitalized the entire treatment

Conceptualize the indicator

We want to COUNT the number of cases that were hospitalized in both the initial AND continuation phases. This means we are retrieving data from 2 program stages.

2021-01-19
Lion District Hospital
Initial Diagnosis
(Open)

→

2021-04-03
 Lion District Hospital
 Continuation 1
(Open)

→

2021-06-30
 Lion District Hospital
 Continuation 2
(Open)

→

2021-09-30
 Lion District Hospital
 End of Treatment
(Open)

←
+
📅
↺

Report date * Due date

2021-01-19

2022-01-28

Type of Patient

TB Patient Type Relapse ✕ ▾

Disease Site

TB Disease Site Extra-Pulmonary ✕ ▾

EPTB Site Pleura ✕ ▾

Type of Treatment for Initial Phase

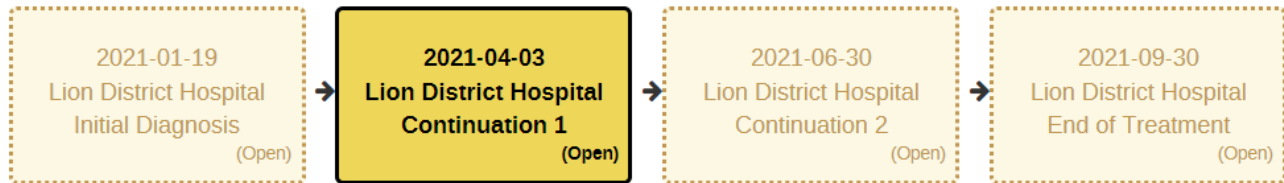
Type of Treatment Hospitalized ✕ ▲

Search...

Sputum Examination Results

Sputum Smear Result
 Hospitalized 👉
 Facility-based DOT

Timeline Data Entry



Report date *

2021-04-03

Due date

2022-01-28

Type of Treatment for Continuation Phase

| | |
|-----------------------------------|--------------------|
| Type of Treatment | Hospitalized |
| Search... | |
| Sputum Examination Results | |
| Sputum Smear Result | Hospitalized |
| | Facility-based DOT |

Edit the indicator details

Navigate to maintenance -> Indicator-> Program Indicator

Select "TB Treatment Card" as the program

- Indicator
- Indicator type
- Indicator group
- Indicator group set
- Program indicator**
- Program indicator group

Program indicator ?

Search by name, code or id

Program
TB Treatment Card

| | |
|---------------------------------|----|
| Name | PI |
| Weight Change (Final - Initial) | TI |

Add a new indicator and edit the program indicator details

Select the blue plus sign to add a new indicator.

First, edit the name, short name and code details.

Program (*)

TB Treatment Card

Name (*)

Hospitalized - Initial and Continuation

Short name (*)

All Treatment Hospitalized

Code

AT_HOSP

Skip color and icon

Next, add a description.

Review the aggregation type, what are we trying to do with this indicator? We want to COUNT the number of cases that were hospitalized during both the initial and continuation phases of treatment.

Review the analytics type. Now we need data from more than one stage, so our analytics type will be ENROLLMENT!

In this particular example, we are creating an enrollment indicator which calculates and displays its information. Note that you can also create a program indicator that calculates the number of enrollments that meet certain criteria. This may be useful if, for example, you want to use data elements with option sets from multiple program stages within the same program in order to filter out the number of enrollments in calculating your indicator.

After selecting the analytics type, you will see "Analytics period boundaries." Leave these all as default, we will not cover them in this academy. You can learn more about them in the [docs](#).

Description

The number of patients that were hospitalized during both the initial and continuation phases of treatment

Decimals in data output

Aggregation type

Count

Analytics type (*)

Enrollment

Analytics period boundaries

Boundary target

Enrollment date

▼

Analytics period boundary type

After start of reporting period

▼

Offset period by amount

Period type

▼

REMOVE

Boundary target

Enrollment date

▼

Analytics period boundary type

Before end of reporting period

▼

Offset period by amount

Period type


▼

REMOVE

Edit the expression

Select the expression tab in order to edit the expression. This is where we define what we want to happen mathematically.

In this case, we can use a simple variable, called enrollment count, to define our expression. We are no longer counting events, but enrollments, as we want to combine information across the enrollment and then evaluate it using our filter.

 The expression defines how the indicator is calculated. Tip: use
d2:condition('bool-expr',true-val,false-val) d2:daysBetween(date,date)
d2:zing(x) d2:oizp(x)


V{enrollment_count}


+-*/%

>>=<<===!=NOTANDOR

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

log10(.periodOffset(


Enrollment count

- Continuation 1
- Continuation 2
- End of Treatment
- Initial Diagnosis
- Attributes
- Variables
 - Completed date
 - Creation date
 - Current date
 - Due date
 - Enrollment count 
 - Enrollment Date
 - Enrollment status
 - Event count
 - Event date
 - Incident Date
 - Organisation unit count
 - Sync date
 - Tracked entity instance count
 - Value count
 - Zero or positive value count
- Constants

Edit the filter

Select the filter tab in order to edit the filter. Here we define what criteria we want to include in our mathematical calculation. We want to count events, but which ones? In our case, those where the treatment outcome is either treatment failure or died.

Type of treatment is included in both the initial and continuation 1 program stages. Data elements we put into our expression include identification of which program stage it belongs to. This allows us to combine and evaluate data from multiple program stages.

In program indicators, options are identified via their code within an option set. In this example, the name and the code are the same, but if you are not familiar with the metadata, it is usually a good idea to check the code of the option you are using.

Edit option

Name (*)

Hospitalized

Code (*)

Hospitalized

Edit the expression

Let's review the expression



The filter is applied to events and filters the data source used for the calculation of the indicator. The filter must evaluate to either true or false. Use single quotes for text values. Use option codes for option set references. Tip: use d2:condition('bool-expr',true-val,false-val) d2:daysBetween(date,date) d2:zing(x) d2:ozp(x)

```
#{JBm6bPclv4Y.WoYbh91d8TB} == 'Hospitalized' and #
{SXhH8YtwM1Q.WoYbh91d8TB} == 'Hospitalized'
```

+

-

*

/

%

>

>=

<

<=

==

!=

NOT

AND

OR

if(

isNull(

isNotNull(

firstNonNull(

greatest(

least(

log(

log10(

.periodOffset(



Initial Diagnosis\TBTC|Type of Treatment == 'Hospitalized' and
Continuation 1\TBTC|Type of Treatment == 'Hospitalized'

The data elements in our expression are identified as {program stage.data element}. We can see we have the same data element, but the program stage id is different. We can also see this in the green verification box below.

Test the program indicator

Now that you have created the program indicator, it is a good idea to test if it is functional. You can compare the properly configured indicator with the one you have created to ensure that the value is correct. In order to do this you can navigate to the pivot table app.

Navigate to the data visualizer app

Create a new pivot table with the following details

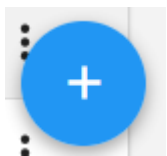
- Data : the program indicator you made, the program indicator "Hospitalized - Initial and Continuation"
- Period : This year
- Organisation Unit : Trainingland

Click on update to verify that the values are equal in the indicators. This will provide some validation that the indicator is created correctly.

| Trainingland | | |
|--------------|---|--|
| | Hospitalized - Initial and Continuation | KT_Hospitalized - Initial and Continuation |
| 2023 | 38 | 38 |

Exercise 5 - Indicator 5 - Change in Weight

Navigate back to Indicators -> Program Indicators and click on New to create a new indicator



Conceptualize the indicator

Create a program indicator which calculates the difference in weight between the initial diagnosis and end of treatment. This should only be calculated on the condition that the culture result is negative and the treatment outcome is either cured or completed.

Edit the program indicator details

After selecting the plus sign, ensure the program you are working with is selected. Fill in the details as follows (replace your initials with the ones in the screenshot). Note in this case you are using "Enrollment" as the aggregation type. This type of program indicator calculates the indicator using parameters across the entire enrollment, rather than within an event.

We want this indicator to calculate on the fly and then be displayed directly in tracker capture. In order to accomplish this, ensure that "Display in form" is checked.

1 Program indicator details

Program (*)

TB Treatment Card



Name (*)

Weight Change (Final - Initial)

Short name (*)

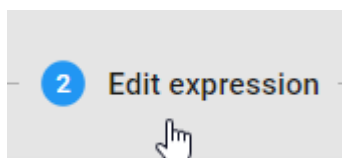
Weight Change

Code

Color

Edit the expression

Select edit expression from the timeline menu



For the expression, you want to take the difference between the weight during the end of treatment stage and the initial diagnosis stage. TB tends to cause additional weight loss often, and after treatment they should hopefully gain some of this back.

1

Program indicator details

2

Edit expression

The expression defines how the indicator is calculated. Tip: use d2:condition('bool-expr,true-val,false-val') d2:daysBetween(date,date) d2:zing(x) d2:olzp(x)

```
#{1Xw8SKe7k8i.e89hG75Qsau} - #{3Bm6bPc1v4Y.e89hG75Qsau}
```

End of Treatment.Weight (in kg) - Initial Diagnosis.Weight (in kg)

Continuation 1

TBTC|Sputum Smear Result

TBTC|Culture Result

TBTC|Treatment Outcome

Weight (in kg)

Continuation 2

End of Treatment

TBTC|TB Patient Type

TBTC|TB Disease Site

TBTC|EPTB Site

TBTC|Type of Treatment

TBTC|Sputum Smear Result

TBTC|Culture Result

TBTC|GeneXpert Result

Weight (in kg)

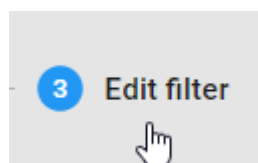
Attributes

Variables

Constants

Edit the Filter

Select edit filter from the timeline menu



We are now going to create our criteria which will filter out the events required (culture result is negative and the treatment outcome is either cured or completed).

When we set criteria within a filter using option sets, we must use the option code. The option code may be different than the name, We will have to set three criteria using the available data elements from the program:

- Culture Result == 'Negative (0 colonies)' and
- Treatment Outcome == 'Cured' or Treatment Outcome == 'Treatment completed'

You can select the data elements from the right side menu as before. In the filter box, you will see the `programuid.dataelementuid` as in the expression. Underneath in the green box, you will see this represented in plain text which is easier to decipher.



The filter is applied to events and filters the data source used for the calculation of the indicator. The filter must evaluate to either true or false. Use single quotes for text values. Use option codes for option set references. Tip: use d2:condition('bool-expr',true-val,false-val)
d2:daysBetween(date,date) d2:zing(x) d2:ozip(x)

```
#({iXw8SKe7k8i.gq6nn1XxhyY} == 'Negative (0 colonies)' and (#({iXw8SKe7k8i.VjK4J8h7dMF} == 'Cured' or #
{iXw8SKe7k8i.VjK4J8h7dMF} == 'Treatment completed'))
```



End of Treatment.TBTC|Culture Result == 'Negative (0 colonies)' and (End of Treatment.TBTC|Treatment Outcome == 'Cured' or End of Treatment.TBTC|Treatment Outcome == 'Treatment completed')

Notice how the **or** condition is contained within brackets. This is required to ensure the filter runs properly. Note that if you are grouping multiple and/or conditions together to create a specific filter criteria, then you will need to use brackets. Save the indicator after you have entered and explained the filter.

Test the program indicator

Navigate to tracker capture in this case to test the program indicator. Clear your cache if you have accessed the program already.

Select any Facility that has the TB Treatment Card program.

Registration and Data Entry

Reports

Trainingland

- Animal Region
 - Bird District
 - Cardinal Hospital Gateway PHC
 - Crow Health Centre
 - Hawk Primary Health Centre
 - Ostrich Health Centre
 - Owl Dispensary
 - Parrot District Hospital**
 - Peacock Dispensary
 - Pigeon Primary Health Centre
 - Robin Primary Health Centre


TB Treatment Card

Lists Search

Custom working list

| Registering unit | TB Registration Number |
|--------------------------|------------------------|
| Parrot District Hospital | DC3117255 |
| Parrot District Hospital | FC6144568 |
| Parrot District Hospital | AE9807367 |
| Parrot District Hospital | IB1007092 |
| Parrot District Hospital | EB2417773 |
| Parrot District Hospital | CI3635837 |

Proceed to register a new TEI. Click on Save and continue when the details are entered. You may want to select a report date that is ~5-6 months back from the current date as this is the average difference between the initial diagnosis and end of treatment stages.

| | |
|---|--|
| Enrolling organisation unit | Parrot District Hospital |
| Report Date | 2023-01-04 |
| <h2>Profile</h2> | |
| TB Registration Number | DB7926192 |
| First Name | Bart |
| Last name | Simpson |
| Sex | Male  |
| Date of Birth | 1982-06-02 |
| Age | 41 |
| Pregnant | <input type="radio"/> Yes <input type="radio"/> No |
| Family Address | <input type="text"/> |
| Phone number | <input type="text"/> |
| <div>Save and continue Save and add new Print form Cancel</div> | |

In the tracker dashboard, you will see a space for indicators as well as the timeline data entry. The weight indicator will appear when you the filter meets your criteria that was set earlier

- Culture Result == 'Negative (0 colonies)' and
- Treatment Outcome == 'Cured' or Treatment Outcome == 'Treatment completed'

Patient Age

41 years + 29 days

Weight indicator will appear here

abular Data Entry

Initial Diagnosis

Continuation 1

Continuation 2

End of Treatment

Report date *

2023-01-04

TB Patient Type

TB Patient Type

Select or search f

Disease Site

TB Disease Site

Select or search f

Type of Treatment for Initial Phase

Type of Treatment

Select or search f

Sputum Examination Results

Sputum Smear Result

Select or search f

Culture Result

Select or search f

GeneXpert Result

Select or search f

Weight

Weight (in kg)

Complete

To get started enter a weight value in the **Initial Diagnosis** stage

Tabular Data Entry

Initial Diagnosis

Continuation 1

Continuation 2

End of Treatment

Report date *

2023-01-04

TB Patient Type

TB Patient Type

Select or search from

Disease Site

TB Disease Site

Select or search from

Type of Treatment for Initial Phase

Type of Treatment

Select or search from

Sputum Examination Results

Sputum Smear Result

Select or search from

Culture Result

Select or search from

GeneXpert Result

Select or search from

Weight

Weight (in kg)

60

Than add an event for the end of treatment stage

| Tabular Data Entry | |
|----------------------|--------------------------------|
| Initial Diagnosis | Report date * 2023-06-21 |
| Continuation 1 | Due date yyyy-MM-dd |
| Continuation 2 | |
| End of Treatment | |
| Sputum Smear Results | |
| Sputum Smear Result | Select or search from the list |
| Culture Result | Negative (0 colonies) |

Enter a weight value, select ****negative**** as the **culture result**, and select either **Cured** or **Treatment completed** as the **treatment outcome**. Note to the participants that the weight indicator does not appear unless these criteria are met.

| Indicators | |
|-----------------------------------|--------------------------------------|
| Patient Age 41 years + 29 days | Weight Change (Final - Initial) 8 |

Only appears when filter criteria are met

| Tabular Data Entry | |
|----------------------|--------------------------------|
| Initial Diagnosis | Report date * 2023-06-21 |
| Continuation 1 | Due date yyyy-MM-dd |
| Continuation 2 | |
| End of Treatment | |
| Sputum Smear Results | |
| Sputum Smear Result | Select or search from the list |
| Culture Result | Negative (0 colonies) |
| Weight | |
| Weight (in kg) | 68 |
| Outcome | |
| Treatment Outcome | Cured |

Creating Combined Indicators

Exercise 6 - Indicator 6 : TB Incidence rate per 100,000

Here we can take program indicators and combine them with aggregate data elements to make indicators as required. We do this by using the regular indicators app.

Conceptualize the indicator

We want to calculate the TB incidence rate per 100,000 population. This is equal to:

$(\text{The number of new TB cases} / \text{Total Population}) * 100,000$

If we break this down,

1. We can retrieve the number of new TB cases from our TB treatment card program. We need to create a program indicator to retrieve this total
2. The total population is an aggregate data element that we might import into DHIS2 from a census or other estimation survey
3. We multiply the divided values by 100,000 to calculate our incidence rate

Review the program indicator

A program indicator, TB new cases, has already been created as part of this demonstration. You can review it quickly to see the aggregation type, expression and filter.


Review the denominator


We can use the data element “Total Population” as our denominator. This already exists as a data element in our system and also already has data within it.


Data element management


[Search by name, code or id](#)

total pop




Domain type 

Value type 

Category combination 

| Name | Domain type | Value type |
|------------------|-------------|------------|
| Total Population | Aggregate | Integer |

 Total Population

Review the indicator type

We want to create an indicator with a factor of 100,000. This already exists in our system and we can use it when we build our indicator.

Name (*)

Per 100 000

Factor (*)

100000

SAVE

CANCEL

Create a new indicator

Navigate to the indicator management page (Maintenance -> Indicator) and proceed to create a new indicator.

Add in the details of your indicator

Name (*)

TB Incidence per 100, 000

Short name (*)

TB Incidence per 100, 000

Code

TB_INCIDENCE

Color

SELECT COLOR

Icon

ADD ICON

Description

(The number of new TB cases/Total Population) * 100, 000. The number of new TB cases is taken from the program "TB Treatment Card" while the total population is an estimate from the most recent census.

☐ Annualized

Decimals in data output

2

Indicator type (*)

Per 100 000

Here is an example description:

(The number of new TB cases/Total Population) * 100, 000. The number of new TB cases is taken from the program "TB Treatment Card" while the total population is an estimate from the most recent census.

Edit the numerator

I am able to select program indicators as a source here in the indicator management page.

Select

- 1. Programs
- 2. TB Treatment Card
- 3. Indicators
- 4. The indicator TB new cases
- 5. Enter a description
- 6. Save

Edit numerator

Description

TB new cases

I{ZcoA5xNIYsC}

() * / + - Days

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

log10(.periodOffset(

TB new cases

Valid

DATA ELEMENTS PROGRAMS ORG UNIT COUNTS CONSTANTS REPORTING RATES

TB Treatment Card

DATA ELEMENTS PROGRAM TRACKED ENTITY ATTRIBUTES INDICATORS

Extra Pulmonary TB

Hospitalized - Initial and Continuation

New, Pulmonary TB

SND_Extra Pulmonary TB

SND_Hospitalized - Initial and Continuation

SND_New, Pulmonary TB

SND_Treatment outcome - failure or death

SND_Treatment outcome - failure or death (M, >60)

TB new cases

Treatment outcome - failure or death

CANCEL DONE

Edit the denominator

Select

- 7. Data Elements
- 8. The data element Total Population
- 9. Enter a description
- 10. Save

Save the indicator before proceeding

Take a small break and notify the instructor you made your indicator. You won't be able to see the output yet, the instructor will explain.

Verify the indicator in data visualizer

Create a pivot table with the inputs:

1. Data:

1. TB new cases (program indicator from TB treatment card)
2. Total population (data element)
3. TB Incidence per 100,000 (the indicator you just made)

2. Period : Last year

3. Org unit : Trainingland

| Trainingland | | | |
|--------------|--------------------|------------------|-----------------------------------|
| | TB new cases | Total Population | TB incidence per 100,000 |
| 2022 | 10 | 10 927 273 | 0.09 |

You can verify the calculation manually and see if the result is correct!