

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

Type of Treatment for Initial Phase

Type of Treatment

Select or search from the list

Search...

Pulmonary

Extra-Pulmonary

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

Weight Change (Final - Initial)

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:ozip(x)`

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

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:ozp(x)

```
#{JBm6bPc1v4Y.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 : Last 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_Extra Pulmonary TB	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

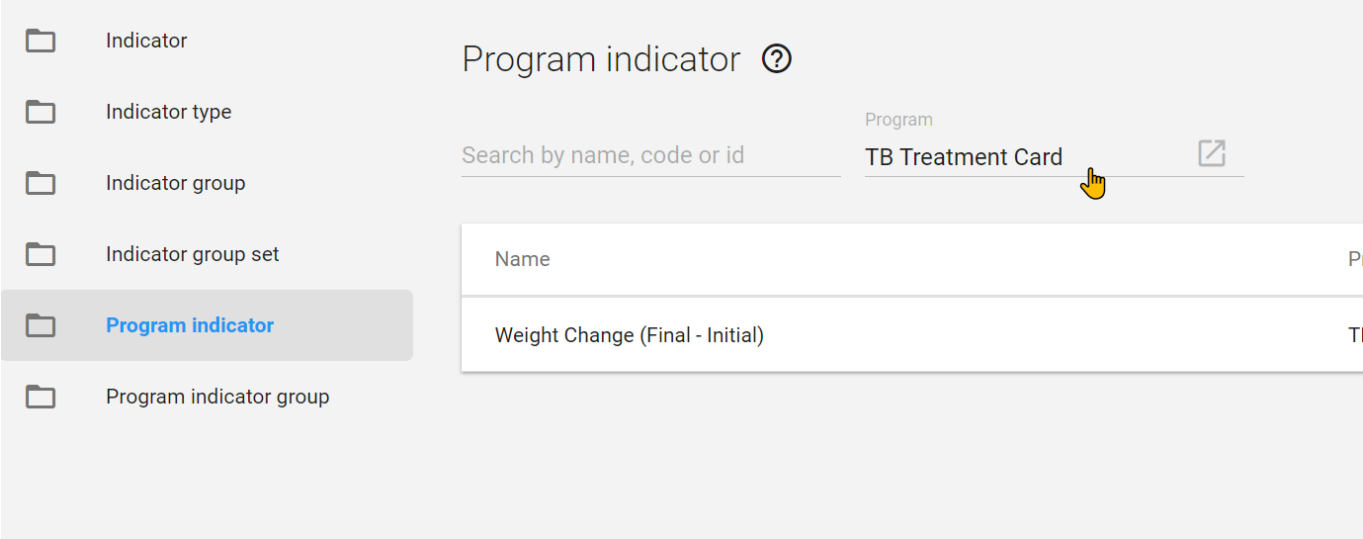
Pulmonary

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.

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

- ▶ 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 patient type is new AND the disease site is pulmonary.

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

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.

Name (*)

New

Code (*)

New

Name (*)

Pulmonary

Code (*)

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)`

```
#{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 : Last 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

AddClear

Treatment failure

Search...

Cured

Treatment completed

Died

Treatment failure

Loss to follow-up

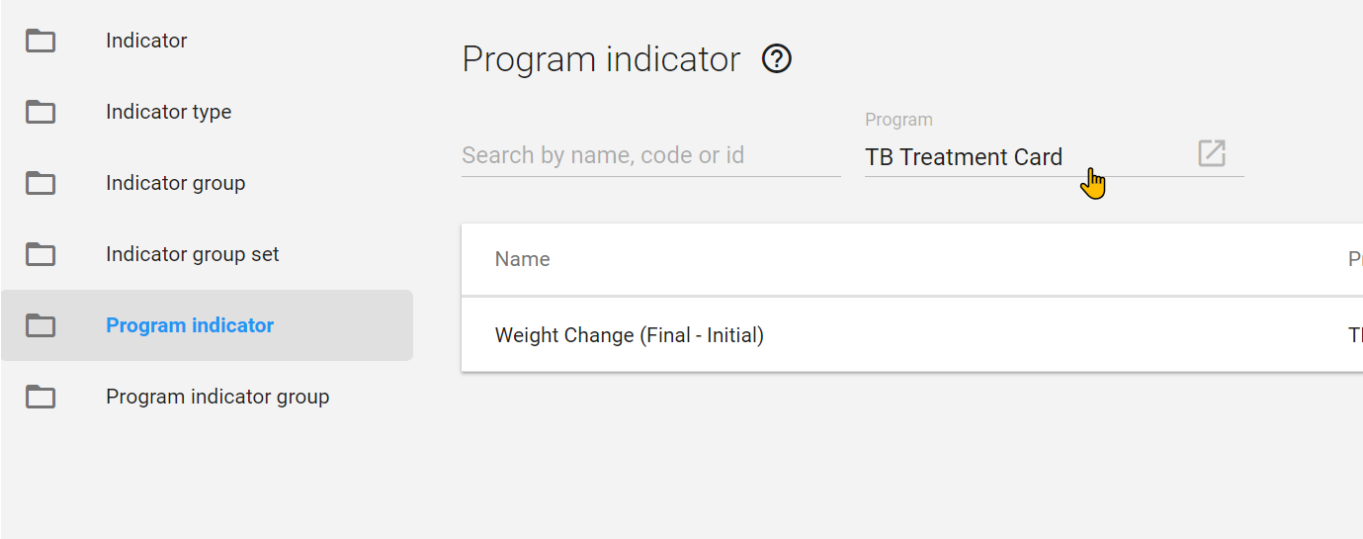
Not evaluated

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

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

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 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 : Last 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		
	Treatment outcome - failure or death	KT_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	<div><div></div><div>Edit</div></div>
Treatment outcome - failure or death	TB Tr		<div><div></div><div>Clone</div></div>
Treatment outcome - failure or death	TB T		<div><div></div><div>Sharing settings</div></div>

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 *

2021-01-19

Due date

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

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 *

2021-04-03

Due date

2022-01-28

Type of Treatment for Continuation Phase

Type of Treatment	Hospitalized
	Search...
Sputum Examination Results	
	Hospitalized
Sputum Smear Result	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:ozip(x)

V{enrollment_count}

+ - * / %

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

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:ozip(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 : Last 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_Hospitalized - Initial and Continuation	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 - End of Treatment and Initial Diagnosis

Short name (*)

Weight Change

Code

Description

Decimals in data output

Aggregation type

Average

Analytics type

Enrollment


☒ Display in form

Edit the expression

Select edit expression from the timeline menu

2

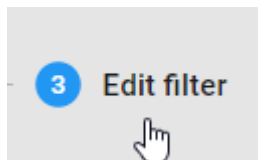
Edit expression



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.

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:ozp(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 PH

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

Woodpecker Health Centre

Tracker capture

TB Treatment Card

Total: 3

Registering unit	TB Registration Number
Parrot District Hospital	50651089
Parrot District Hospital	30233970
Parrot District Hospital	69525075

Number of pages: 1

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	2023-01-01

Profile

TB Registration Number	IF9177948
First Name	Bart
Last name	Sim
Sex	Male
Date of Birth	1982-06-02
Age	41
Family Address	
Phone number	

Save and continue	Save and add new	Print form	Cancel
-------------------	------------------	------------	--------

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 + 13 days

Weight indicator will appear here

Timeline Data Entry

2023-01-01
Parrot District Hospital
Initial Diagnosis
(Open)

2023-03-02
Parrot District Hospital
Continuation 1
(Overdue)

2023-06-31
Parrot District Hospital
Continuation 2
(Overdue)

Report date *

2023-01-01

Due date

2023-07-05

TB Patient Type

TB Patient Type

Select or search from the list

Disease Site

TB Disease Site

Select or search from the list

Type of Treatment for Initial Phase

Type of Treatment

Select or search from the list

Sputum Examination Results

Sputum Smear Result

Select or search from the list

Culture Result

Select or search from the list

GeneXpert Result

Select or search from the list

Weight

Weight (in kg)

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

Back

TB Registration Number : IJ3820943

First Name : Bart

Last name : Sim

Patie

Patient Age

41 years + 13 days

Timeline Data Entry

2023-01-01

Parrot District Hospital

Initial Diagnosis

(Open)

→

2023-03-02

Parrot District Hospital

Continuation 1

(Overdue)

→

2023-06-31

Parrot District Hospital

Continuation 2

(Overdue)

Report date *

2023-01-01

Due date

2023-07-05

TB Patient Type

TB Patient Type

Select or search from the list

Disease Site

TB Disease Site

Select or search from the list

Type of Treatment for Initial Phase

Type of Treatment

Select or search from the list

Sputum Examination Results

Sputum Smear Result

Select or search from the list

Culture Result

Select or search from the list

GeneXpert Result

Select or search from the list

Weight

Weight (in kg)

60

Than add an event for the end of treatment stage

Add new event for stage **End of Treatment**

Program stage

End of Treatment

Report date

2023-07-06

Save

Cancel

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 + 13 days	Weight Change (Final - Initial) 8
-----------------------------------	--------------------------------------

Only appears when filter criteria are met

Timeline Data Entry

2023-01-01 Parrot District Hospital Initial Diagnosis (Open) → 2023-03-02 Parrot District Hospital Continuation 1 (Overdue) → 2023-05-31 Parrot District Hospital Continuation 2 (Overdue) → 2023-07-05 Parrot District Hospital End of Treatment (Open)

Report date: 2023-07-05 Due date: yyyy-MM-dd

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

Complete Delete Print form

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:

(The number of new TB cases/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

x

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 ELEMENTSPROGRAMSORG UNIT COUNTSCONSTANTSREPORTING RATES

TB Treatment Card

DATA ELEMENTSPROGRAM TRACKED ENTITY ATTRIBUTESINDICATORS

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
2023	1 709	10 927 273	15.64

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