

Learner's Guide to Program Indicator Analysis

What is this guide?

This guide contains all exercises and detailed steps to perform them related to program indicator analysis session for the academy. Please perform each of the exercises when prompted to by your instructors.

Learning objectives for this session

- 1. Describe what a program indicator is
- 2. Describe how program indicators are derived
- 3. Describe the difference between event and enrollment program indicators
- 4. Understand how program indicators can fill tracker data analysis gaps present in other visualization tools
- 5. Create visualizations using program indicators derived from tracker data




Exercise 1

Create a pivot table in data visualizer using an enrollment program indicator from the COVID-19 Vaccination Registry program

Create a pivot table using a single program indicator in data visualizer. It will have the following inputs:

- Visualization Type : Pivot Table
- Data
 - Data Type : Program Indicator
 - Program : COVID-19 Vaccination Registry program
 - Program Indicator : Underlying conditions
- Period : This month and Last month
- Org Unit : All Level 2 OUs

The layout can look like this

Columns	<div><div> Data: 1 selected ...</div><div> Period: 1 selected ...</div></div>	Filter
Rows	<div> Organisation Unit: 1 selected ...</div>	

The table is saved as "COVAC - Underlying Conditions, this month and last month" as reference.

↶ Update

File

Options

Download

Columns

📄 Data: 1 selected ...

🕒 Period: 2 selected ...

Rows

🏠 Organisation unit: 1 selected ...

	Underlying conditions	
	January 2024 ▾	February 2024 ▾
01 Vientiane Capital	19	13
02 Phongsali	10	29
03 Louangnamtha	13	9
04 Oudomxai	14	17
05 Bokeo	8	12
06 Louangphabang	34	25
07 Houaphan	27	23
08 Xainyabouli	29	25
09 Xiangkhouang	17	15
10 Vientiane	12	15
11 Bolikhamxai	26	18
12 Khammouan	22	29
13 Savannakhet	58	44
14 Salavan	22	27
15 Xekong	11	7
16 Champasak	24	17
17 Attapu	11	7
18 Xaisomboun	4	9

This is an enrollment type program indicator that is pulling its information from the data element "COVAC - Underlying conditions."

Underlying Conditions

COVAC - Pregnancy

No

COVAC - Underlying condition

Yes

Enrollment is being used for this program indicator so it does not double or triple count the number of individuals with an underlying condition (remember, this program consists of a single repeated stage).

You can quickly compare the two reports by duplicating your current tab followed by opening the saved table "COVAC - Underlying Conditions (event), last 6 months."

	Underlying conditions (event)					
	January 2024 ▴ ▾	February 2024 ▴ ▾	March 2024 ▴ ▾	April 2024 ▴ ▾	May 2024 ▴ ▾	June 2024 ▴ ▾
01 Vientiane Capital	20	23	28	33	37	87
02 Phongsali	10	39	54	41	56	91
03 Louangnamtha	14	16	22	23	32	81
04 Oudomxai	14	31	40	58	69	90
05 Bokeo	9	20	27	26	27	57
06 Louangphabang	34	46	80	84	76	172
07 Houaphan	27	39	63	71	74	137
08 Xainyabouli	29	49	62	94	100	164
09 Xiangkhouang	17	29	35	39	37	82
10 Vientiane	12	21	41	47	42	109
11 Bolikhamxai	26	34	43	50	45	69
12 Khammouan	23	43	74	85	69	132
13 Savannakhet	58	78	121	132	152	303
14 Salavan	22	45	61	63	66	148
15 Xekong	11	16	20	25	33	71
16 Champasak	25	36	73	75	76	186
17 Attapu	11	16	30	31	38	69
18 Xaisomboun	4	12	15	17	15	39

You will see the event based indicator reports higher values as it is counting the underlying condition variable for every event; this does not make sense in this scenario if you want to know the total number of unique people with an underlying condition.

Note that you are able to create this same output in event reports using an enrollment pivot table. So far, we have not addressed any gap but are just showing that it is possible to pull filtered tracker data into data visualizer.

Create a chart using event indicators from different program stages from the COVID-19 Case-based Surveillance Program

One gap that we can address however is creating a pivot table, chart or map using data from different program stages. We can do this in data visualizer for any of the available visualizations using either event or enrollment type program indicators and is not something we could achieve in either event reports or event visualizer.

In this example, we will create a line chart with the following inputs:

- Visualization Type : Line Chart
- Data
 - Data Type : Program Indicator
 - Program : COVID-19 Case-based Surveillance Program
 - Program Indicators :
 - COVID-19 Symptoms present
 - COVID-19 Symptoms present - death
 - COVID-19 Symptoms present - recovered
- Period : This Year
- Org Unit : All Level 2 OUs

In order to create this chart, ensure your layout looks like this:

Series

Data: 3 selected

...

Filter

Period: 1 selected

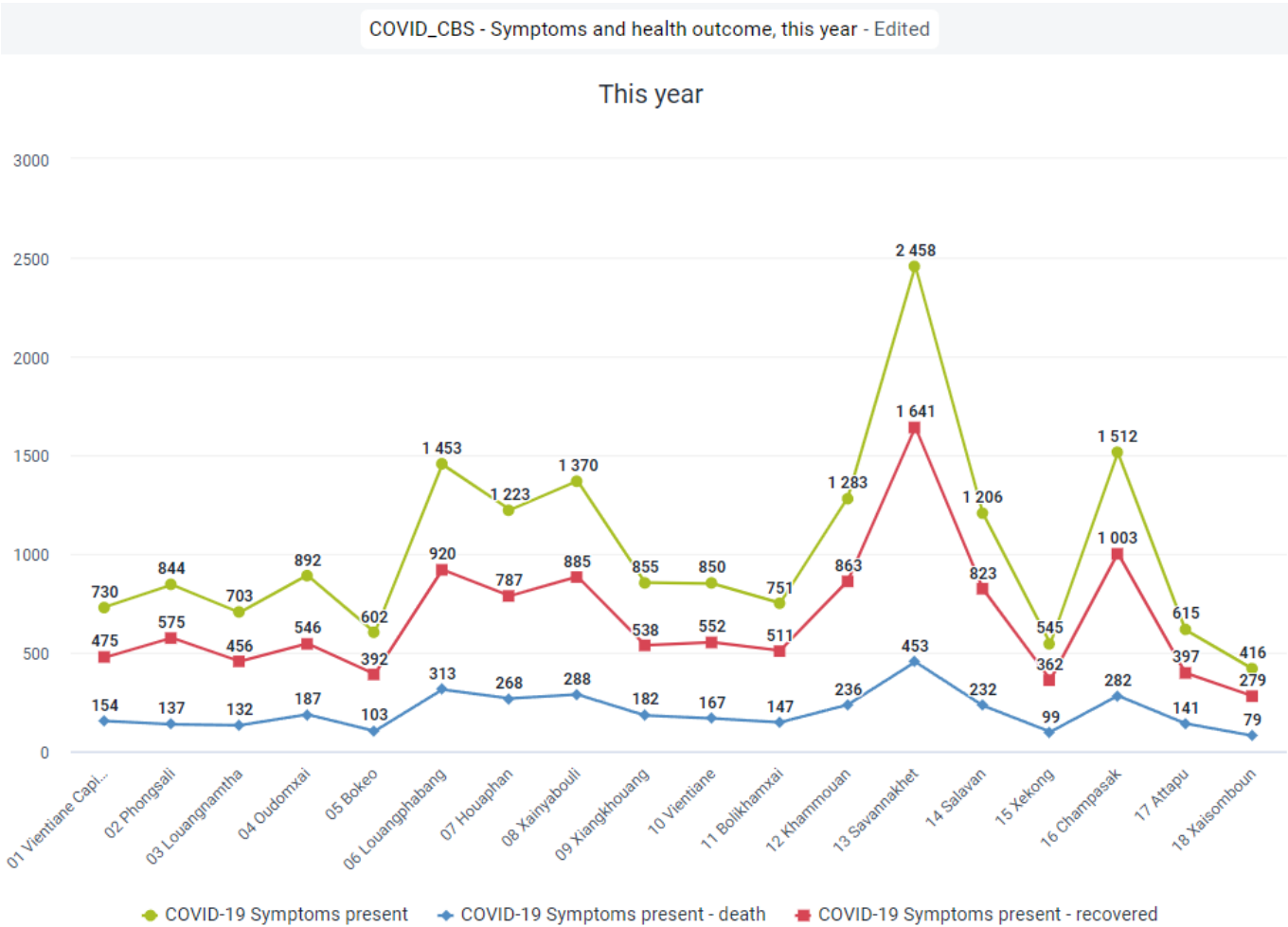
...

Category

Organisation Unit: 1 selected

...

The chart is saved as "COVID_CBS - Symptoms and health outcome, this year" as reference.



This chart uses enrollment indicators, including combining data from Stage 1 (Clinical exam and diagnosis), where it gets the data on whether or not a person has symptoms, and Stage 4 (Health Outcome), where it gets the information on whether or not the person died or recovered. It is not possible to create this type of output using event visualizer.

You can convert this chart to a pivot table to review that creating pivot tables using data from multiple stages is now possible; this is not possible in event reports.


2024			
	COVID-19 Symptoms present	COVID-19 Symptoms present - death	COVID-19 Symptoms present - recovered
01 Vientiane Capital	732	154	475
02 Phongsali	844	137	575
03 Louangnamtha	703	132	456
04 Oudomxai	892	187	546
05 Bokeo	602	103	392
06 Louangphabang	1 453	313	920
07 Houaphan	1 223	268	787
08 Xainyabouli	1 370	288	885
09 Xiangkhouang	855	182	538
10 Vientiane	850	167	552
11 Bolikhamxai	751	147	511
12 Khammouan	1 283	236	863
13 Savannakhet	2 458	453	1 641
14 Salavan	1 206	232	823
15 Xekong	545	99	362
16 Champasak	1 512	282	1 003
17 Attapu	615	141	397
18 Xaisomboun	416	79	279

Lastly, you can open this table as a map to show you can now use the thematic layer. The thematic layer opens up a number of additional options when working with your data (we will go over an example where we create a map from scratch using a program indicator in the thematic layer during the next part of this session).

Do this by selecting "Open as Map" from the visualization selection.


Pivot table

UpdateFileOptionsDownload




Pivot table

View data and indicators in a manipulatable table.




Column

Compare sizes of related elements vertically. Recommend period as filter.




Stacked column

Compare parts of a whole against related elements vertically. Recommend data or org. unit as series.




Bar

Compare sizes of related elements horizontally. Recommend period as filter.




Stacked bar

Compare parts of a whole against related elements horizontally. Recommend data or org. unit as series.




Line

Track or compare changes over time. Recommend period as category.




Area

Track or compare changes over time. Recommend period as category.




Stacked area

Track or compare parts of a whole over time. Recommend data as series and period as category.




Pie

Compare parts of a whole at a single point in time. Recommend period as filter.




Radar

Compare several items against multiple variables.




Gauge

Compare a percentage indicator against a 100% scale. Recommend period as filter.




Year over year (line)

Compare changes over time between multiple time periods.




Year over year (column)

Compare changes over time between multiple time periods.




Single value

Display a single value. Recommend relative period to show latest data.



Scatter

View the relationship between two data items at a place or time. Recommended for finding outliers.



Open as Map

Visually plot data on a world map. Data elements use separate map layers. 🖱️

When you open this as a map, you will have to select one of the data items used in the chart/table as your primary layer (you can select all 3 but since they are all displaying data at the same OU level, you will in effect only see data from the top layer). Select one of the enrollment indicators (death or recovered) using data from multiple stages to demonstrate that this type of data can be mapped.

Open as map

This chart/table contains 3 data items. Choose which items you want to import from the list below. Each data item will be created as a map layer.

Data items

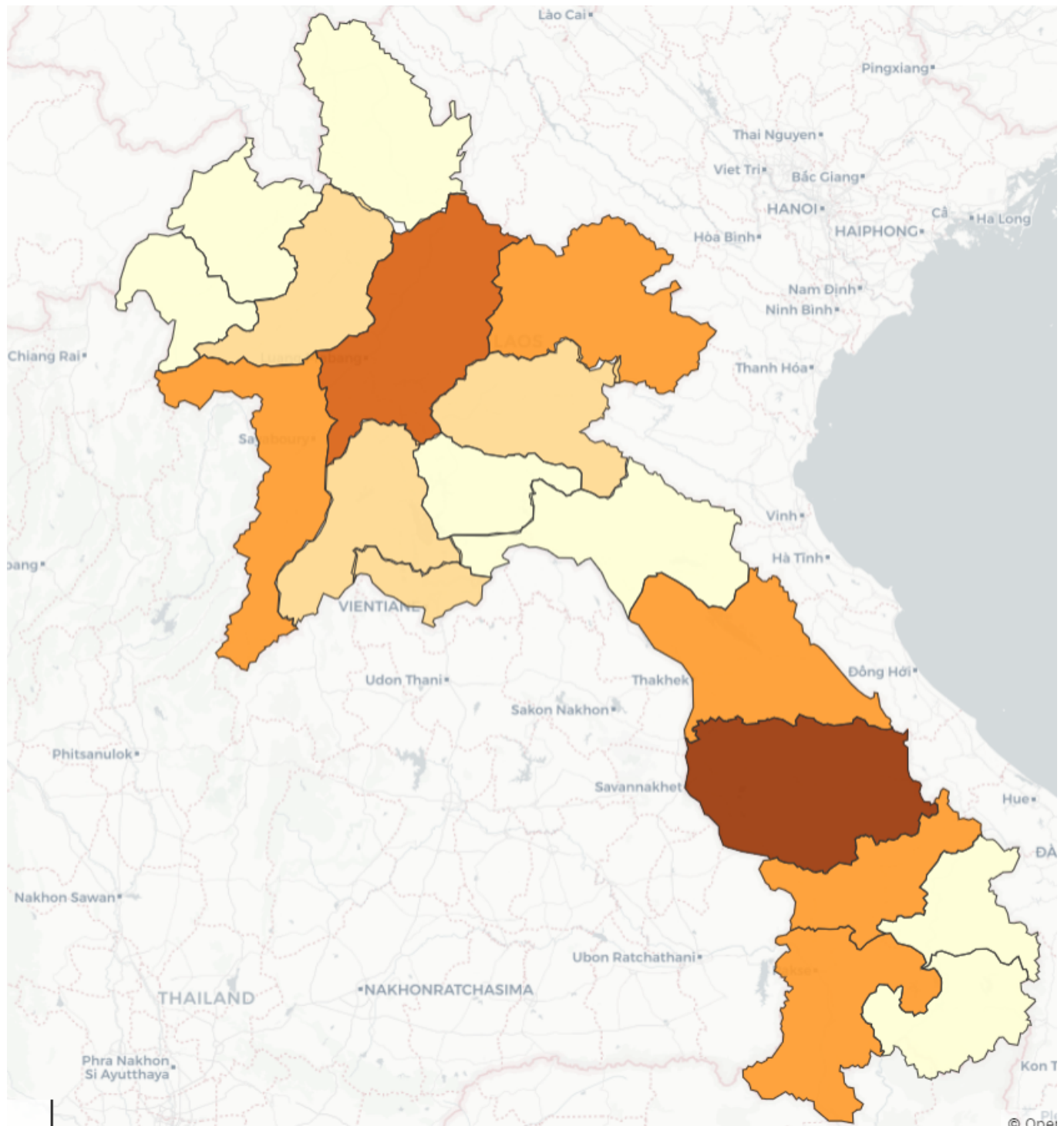
COVID-19 Symptoms pr... X

☐ COVID-19 Symptoms present

☒ COVID-19 Symptoms present - death

☐ COVID-19 Symptoms present - recovered

6 / 17



Exercise 2

Create a map using a program indicator from the COVID-19 Case-Based Surveillance program

In the maps session, we had discussed how we can use the event and TEI layer to map raw tracker data (also known as event data items). While we can also use the thematic layer when dealing with tracker data, this is often less useful as the number of numeric data elements in a tracker program may be limited.

Through the use of program indicators however we are able to extend maps functionality with tracker data significantly as we can use the thematic layer to its full potential. This includes creating split view and timeline maps and using the available style options (such as creating choropleth and bubble maps) that are not available when using the event and TEI layer as examples.

Create a map using the thematic layer with the following inputs:

- Layer Type : Thematic
- Data:
 - Item Type : Program Indicators
 - Program : COVID-19 Case-Based Surveillance
 - Program Indicator : COVID-19 Suspected Cases
 - Leave the aggregation type as default
- Period:
 - Period Type : Relative
 - Period : Last 12 months
 - Display Periods : Timeline
- Org Units : All Level 2 OUs
- Filter : None
- Style : Bubble Map, Single Color Legend

Data Tab

Edit thematic layer

DataPeriodOrg UnitsFilterStyle

Item type

Program indicators

Program

COVID-19 Case-based Surveillance

Program indicator

COVID-19 Suspected cases

Aggregation type

By data element

Cancel

Update layer

Period Tab

Edit thematic layer

Data

Period

Org Units

Filter

St

Period type

Relative

▼

Period

Last 6 months

▼

Display periods

- ☐ Single (aggregate)
- ☒ Timeline
- ☐ Split map views

Cancel

Update

Org Units Tab

Edit thematic layer

DataPeriodOrg UnitsFilterStyle

▼

✓

📁

Lao PDR (1)

▶

☐

📁

01 Vientiane Capital

▶

☐

📁

02 Phongsali

▶

☐

📁

03 Louangnamtha

▶

☐

📁

04 Oudomxai

▶

☐

📁

05 Bokeo

▶

☐

📁

06 Louangphabang

▶

☐

📁

07 Houaphan

▶

☐

📁

08 Xainyabouli

▶

☐

📁

09 Xiangkhouang

▶

☐

📁

10 Vientiane

▶

☐

📁

11 Bolikhamxai

▶

☐

📁

12 Khammouan

Select levels

Level 2

×

▼

Select groups

▼

User organisation units

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📁

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Main

📁

📁

📁

📁

📁

Below

📁

📁

📁

📁

📁

2 x below

Cancel

Update layer

Style Tab

10 / 17

Edit thematic layer

Data

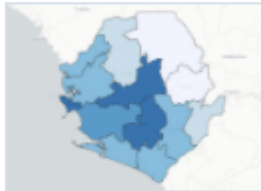
Period

Org Units

Filter

Style

Choropleth

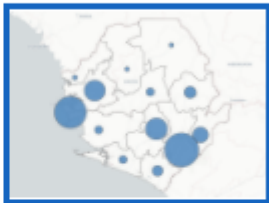


Low radius

5

☐ Labels

Bubble map



High radius

30

☐ Labels

☐ Automatic color legend

☐ Predefined color legend

☒ Single color legend

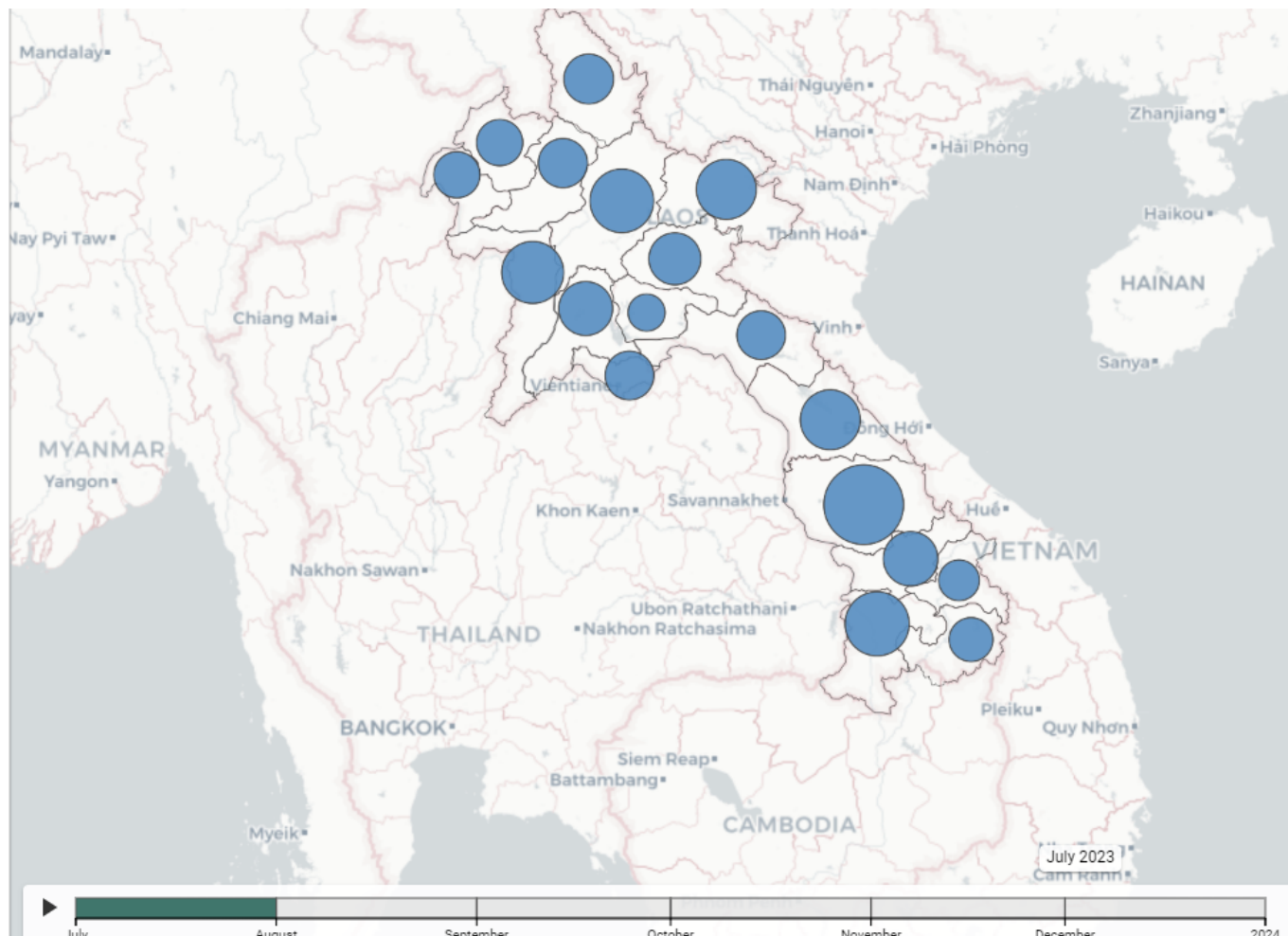
Color

☐ Show no data

Cancel

Update layer

The map has been saved as "COVID_CBS - Suspected cases, last 12 months" for reference.



You can play back the timeline map. You will see over time the monthly values are increasing in line with the COVID-19 situation occurring globally (the map is showing the total number per month, not the cumulative number; cumulative can be shown however the indicator needs to be configured differently).

Exercise 3

In the line list app, create an enrollment report showing the number of relationships by TEI from the COVID-19 Case-based Surveillance Program

Program indicators can be used in event reports and event visualizer as well as within data visualizer and maps, depending on how they are defined. This is because one program indicator can work on two levels:

1. Through creating a summary output for a single TEI
2. Through creating a summary output for all TEIs within a period/org unit

We will demonstrate these principles using two program indicators that use "Average" as the aggregation type.

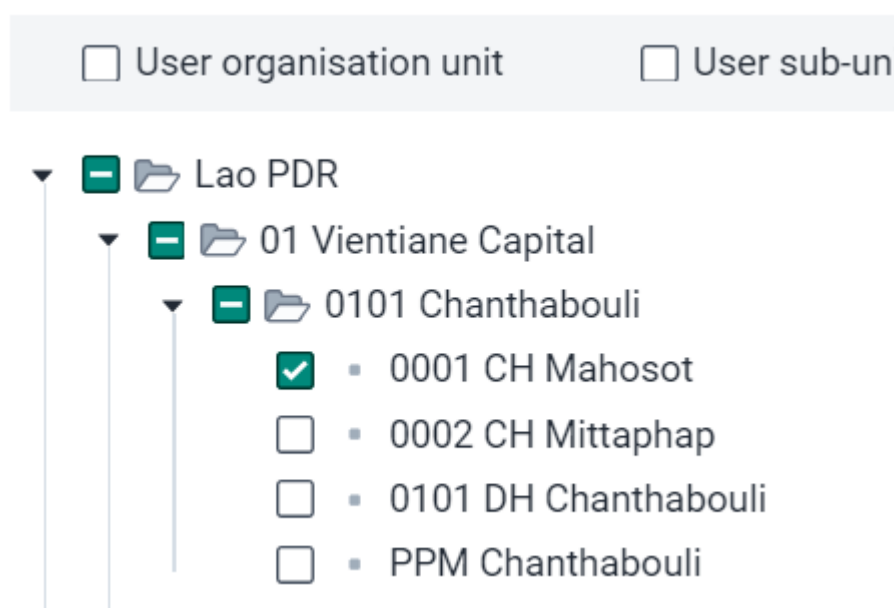
1. COVID-19 Contacts
 1. Summarizes the total number of contacts a single TEI has through the relationships that have been created in tracker capture
 2. Summarizes the average number of contacts for all TEIs based on their enrollment date and the specified period and organisation unit
2. COVID-19 days between onset and consultation

1. Summarizes the total number of days between onset of symptoms and their initial consultation date for single TEI
2. Summarizes the average number of days between onset of symptoms and initial consultation date for all TEIs based on their enrollment date and the specified period and organisation unit

Create a line list table with the following inputs:

- Input Type : Enrollment
- Program Dimesions
 - Program : COVID-19 Case-based Surveillance
 - Data
 - Attributes : First Name, Surname
 - Data Element: Sign/Symptoms Present
 - Program Indicator: COVID-19 Contacts
- Org Unit : CHW Mahosot
- Time Dimension : Case Registrtrion Date (this is the enrollment date)

Note : here is the location of the org unit in case you are unfamiliar with this hierarchy (01 Vientiane Capital - > 0001 CH Mahosot -> CHW Mahosot)



This table has been saved as "COVID_CBS - Contacts by Person" for reference.

Organisation unit name	GEN - Given name	GEN - Family name	CBS - Other signs/symptoms	Contacts	Date of notification	CBS - Days between onset and consultation
0001 CH Mahosot	ALbert	kouassi	No	3	2024-05-23	3
0001 CH Mahosot	James	Dawson	Yes	2	2024-04-24	4
0001 CH Mahosot	Mnemonic	Jonny	Yes	2	2024-04-12	4
0001 CH Mahosot	Temple	Shirley	No	2	2024-05-13	4
0001 CH Mahosot			Not answered	2	2024-05-03	0

You will notice that you can select program indicators from the data tab; however some program indicators may not work as intended or not give you any meaningful output depending on how they have been configured. For example, for a single TEI, any count based indicators within a single event may not be so helpful as the maximum value they can return is 1 for a single TEI.

Sort the table by the "COVID-19 contacts" column. This is showing the number of contacts each person has had as defined through adding relationships via tracker capture.

Add the program indicator "COVID-19 days between symptoms onset and consultation" to your report and update your line list

From the program dimensions tab, add the PI "COVID-19 days between symptoms onset and consultation"

↶ Update

File

View

Options

Download

PROGRAM DIMENSIONS

Organisation unit

Program status

Date of notification

PROGRAM DATA DIMENSIONS

CBS - Days between onset and c...

Type All types

CBS - Days between onset and consultation

Columns

Organisation unit 1 ...

GEN - Given name all ...

GEN - Family name all ...

Contacts all ...

CBS - Days between onset and consultation all ...

↶

Organisation unit name

GEN - Given name

GEN - Family name

0001 CH Mahosot

ALbert

kouassi

0001 CH Mahosot

James

Dawson

0001 CH Mahosot

Mnemonic

Jonny

0001 CH Mahosot

Temple

Shirley

0001 CH Mahosot

Uns

Update your table.

Organisation unit name	GEN - Given name	GEN - Family name	CBS - Other signs/symptoms	Contacts	Date of notification	CBS - Days between onset and consultation
0001 CH Mahosot	ALbert	kouassi	No	3	2024-05-23	3
0001 CH Mahosot	James	Dawson	Yes	2	2024-04-24	4
0001 CH Mahosot	Mnemonic	Jonny	Yes	2	2024-04-12	4
0001 CH Mahosot	Temple	Shirley	No	2	2024-05-13	4
0001 CH Mahosot			Not answered	2	2024-05-03	0

We now have an additional program indicator which is showing the number of days between each person's onset of symptoms and their initial consultation.

Create a bar chart showing the average days between onset and consultation across all level 3 OUs within Savannakhet

As discussed previously, these types of program indicators can function on two levels. We have reviewed how we can use various types of program indicators at the individual level, now we can use the same program indicator and create a summary output.

We will use data visualizer to demonstrate this.

Note: Program indicators are available to select within event visualizer but they often do not result in any output. It is best to use data visualizer to create charts when using program indicators.

In data visualizer, create a chart with the following inputs:

- Visualization Type : Bar Chart
- Data
 - Data Type : Program Indicator
 - Program : COVID-19 Case-based Surveillance Program
 - Program Indicator : COVID-19 days between onset and consultation
- Period : This Year
- Org Unit : Level 3 OUs within Savannakhet

Note : here is the location of the org unit in case you are unfamiliar with this hierarchy

Organisation unit

☐ User organisation unit

☐ User sub-units

- Lao PDR

▶

☒

01 Vientiane Capital

▶

☐

02 Phongsali

▶

☐

03 Louangnamtha

▶

☐

04 Oudomxai

▶

☐

05 Bokeo

▶

☐

06 Louangphabang

▶

☐

07 Houaphan

▶

☐

08 Xainyabouli

▶

☐

09 Xiangkhouang

▶

☐

10 Vientiane

▶

☐

11 Bolikhamxai

▶

☐

12 Khammouan

▶

☐

13 Savannakhet

▶

☐

14 Salavan

▶

☐

15 Xekong

District ✕




Selected: 1 org unit and 1 level

Deselect all


And here is the layout that should be used for the chart

Series

 Data: 1 selected


...

Filter

 Period: 1 selected

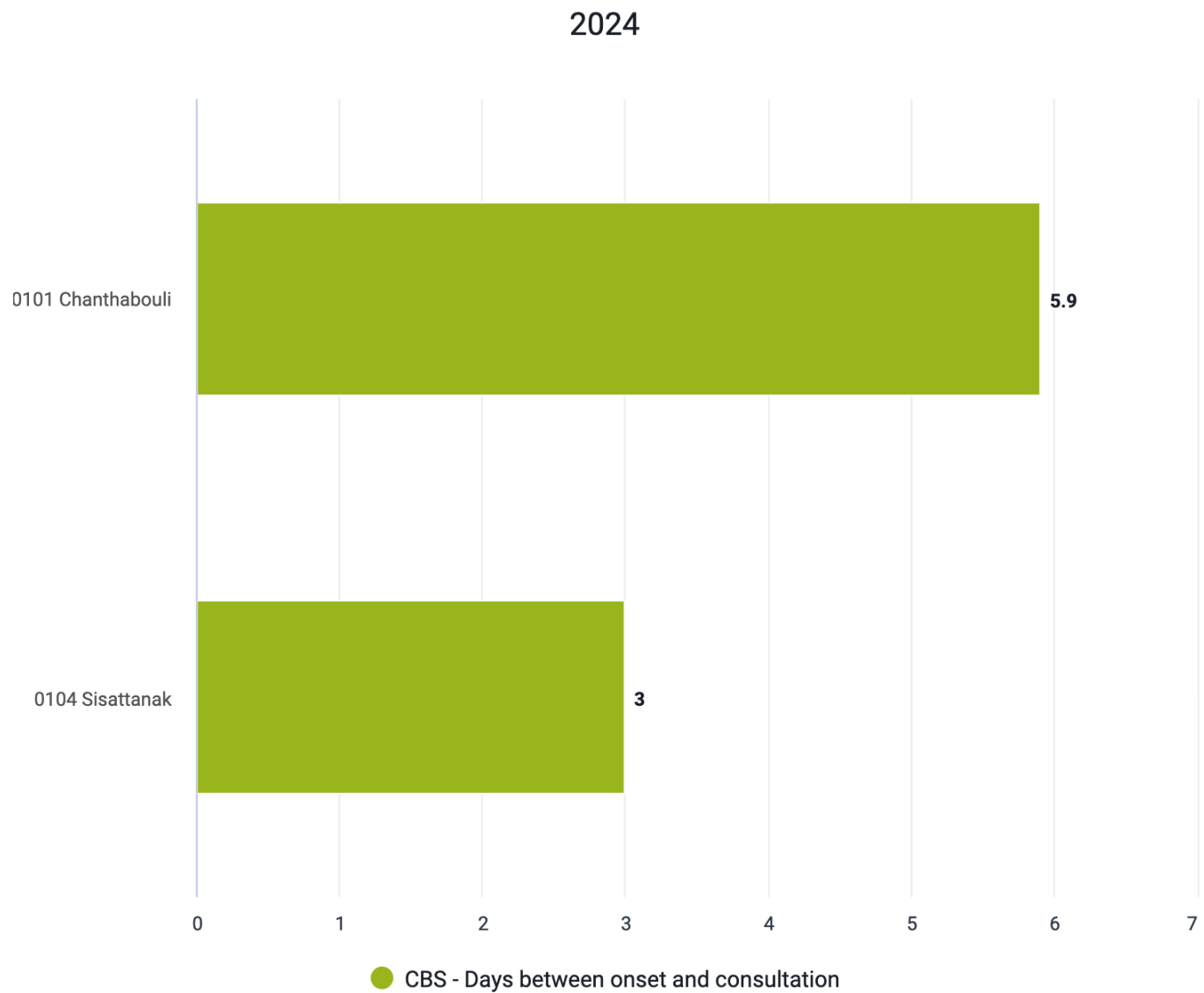
...

Category

 Organisation Unit: 2 selected

...

The chart is saved as "COVID_CBS - Average days between symptoms onset and consultation, this year" as reference.



When we review this chart, we no longer see values that are representative of one individual person, but using the same indicator we are able to take an average for all individuals within the organisation units and period that we have selected.

Summary on these two indicators

From these two program indicator examples, we can see that program indicators can have multiple functions at both the individual and aggregate level. These various functions can be quite useful depending on what information you are looking to review within your system. There are many other advanced possibilities that are available when using these types of indicators. The best source of this information will be the documentation.