Show case of outbreak-tools usage

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Introduction

Outbreak-tools is a set of tools to facilitate the creation and maintainance of Excel linelists. In particular, you can easily:

- Define different types of variables (dropdown lists, Excel formulas) their format and data validation rules.
- Print a register book that perfectly match your linelist.
- Translate your linelist into several languages.
- Use pre-defined geo databases for patient origin.
- Display custom analyses (univariate, bivariate, temporal, spatial) as tables and graphs.

- Export the entire data or selected variables/lines.
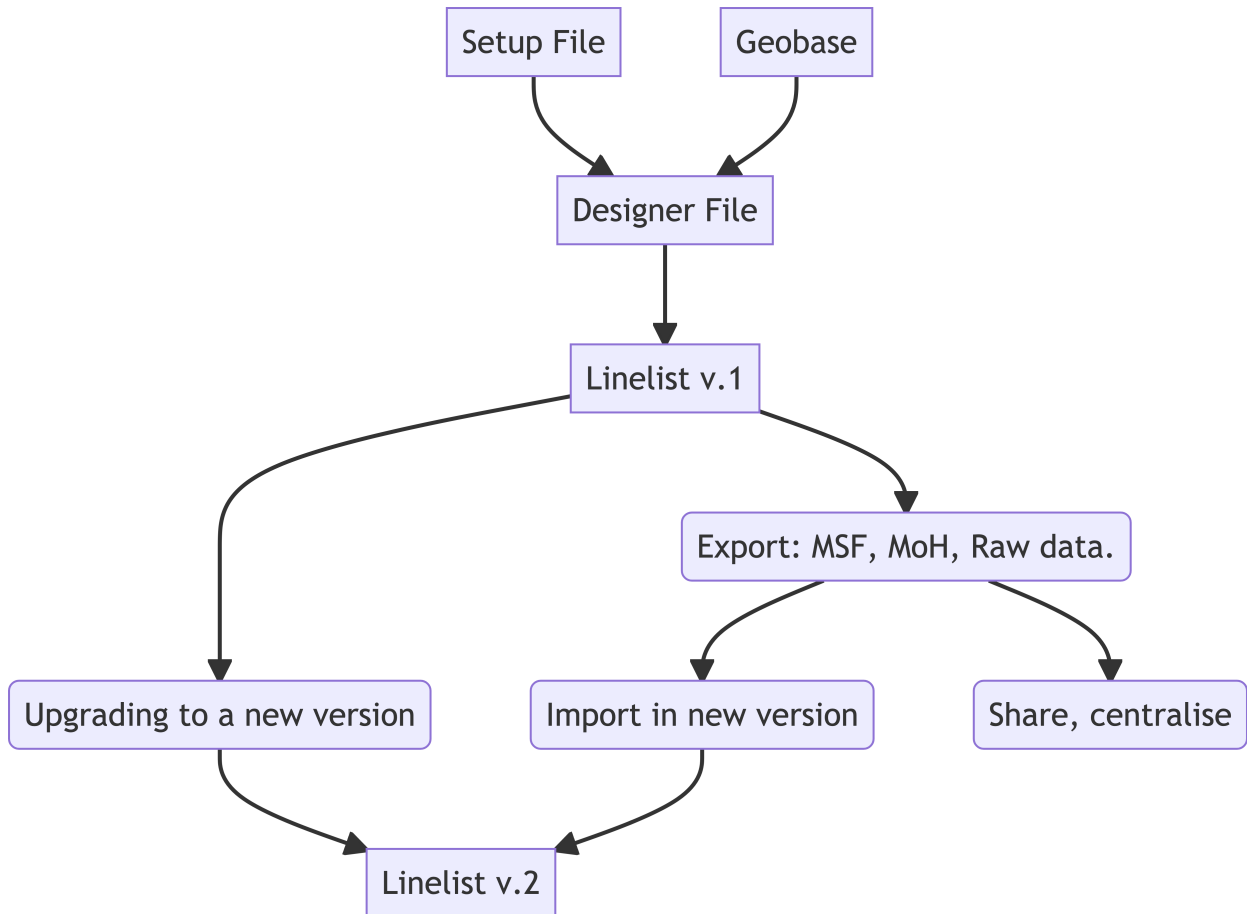- Migrate the data to an updated version of the linelist.

The linelist is defined in a configuration file called *setup*. This *setup* file is then loaded into another file that designs the linelist (the *designer*). The designer creates the linelist, based on the configurations of the *setup*.

There are 3 steps to creating a linelist:

1- Open the setup file and define your needs. The configuration of the file is inspired from Kobo's XLS forms. No in-depth knowledge of Excel is required. A setup file can be used to create linelists in several languages.

2- Download geographic data for the targeted area: There is a Geo-App available online to download the geobase for the region of interest (new users must register). The Geo-App is updated as new geographical information becomes available.

3- Open the designer, load the setup and geobase files, set the options (languages etc) and generate your linelist.

Use-case

In this demo, you'll familiarise yourself with the various features of the tool and simulate a scenario well known to epidemiologists in the field: upgrading a linelist that already contains data to a new version. This often happens when you want to collect new variables as the epidemic unfold and you need to answer new questions.

```
        Setup File        Geobase
              \            /
              Designer File
                    |
               Linelist v.1
              /             \
             /         Export: MSF, MoH, Raw data.
            /              /            \
Upgrading to a new    Import in new    Share, centralise
   version              version
             \          /
             Linelist v.2
```

The folders contain all the materials needed to perform the exercises.

> **i** Download and unzip the materials
>
> You can download the exercices in `zip` file for offline use here. **Extract the zip files after the download.**
> **Be sure the downloaded files are not locked by windows**

On some Windows machine, you will need to unblock downloaded files to be able to use macros. In some cases, excel macro files downloaded from the web are automatically blocked for security reasons. You can unblock the files by:

0- Right click on the file

1- Select Properties

2- Check the *Unblock* box on the bottom right.

❗ Activate macros before exercises

If you're going to run the designer to build a linelist, you'll need to enable VBA macros in Excel, as well as access to the VBA object model:

0- Open Excel

1- Display the *Developer* tab in Excel.

2- In the *Developer* tab, click on *Macro security*. Check the options as shown in the following image:
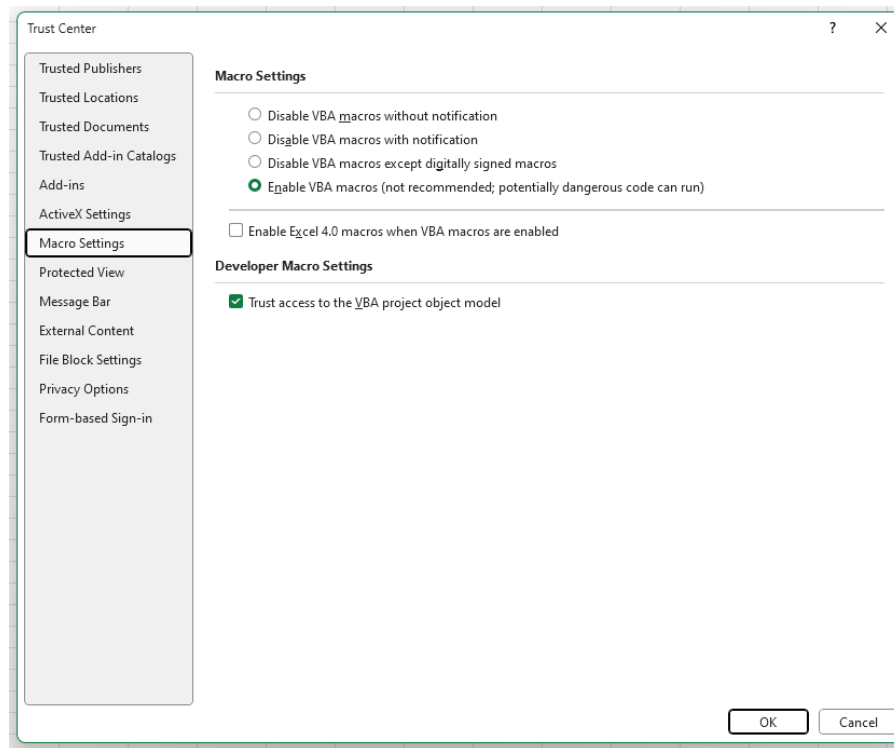
Exercise 1: Getting started.

- Open the linelist `linelist_measles_en_ex1.xlsb` located in the `linelist` folder. The file password is 5678. It contains a mock measles dataset.

- Take a quick look at the different sheets to get an overview.

- In the *Linelist patients* sheet, add one or two patients manually. In particular, use the geo-Helper to enter the patient's origin (see *Data Entry and Print* ribbon).

- Explore univariate, bivariate, temporal and spatial analyses. Use button in *Analyses Sheets* ribbon to recalculate the analyses.

    - In the temporal analysis, change the start/end dates as well as the time unit of the analysis.
    - In the spatial analysis, change the administrative level and divide by the population size to get attack rates (note we don't have population estimates below the health-zone level).

- Go back to the *Linelist patients* and use the filters to show only patients under 2 years of age. Then go back to the analyses sheets and recalculate (use button in *Analyses Sheets* ribbon).

- Export the filtered data using the `anonymous export for MSF` (see *Export button* in *Admin* ribbon). Open and browse the exported file. If you didn't change the password, it should be: **605637**.

- Finally, print a register book for the `Linelist patients` (see *Data Entry and Print* ribbon).

Exercise 2: Adding new variables

- Open the setup file `setup_measles_base_ex2.xlsb` in the `setup` folder. This setup file corresponds to the linelist you've been working with. Take a look at the different sheets and see how they relate to the linelist.

- Now, we would like to add the following variables:

    - In the *Admission* section of *Linelist patients* sheet, just before the *hospitalisation* sub-section:
        * A variable called `muac` (MUAC) that can take three values: "Green (125+mm)", "Yellow (115-124mm)", "Red (< 115mm)"
    - In the *Vaccination* section of *Linelist patients* sheet, just after *Vaccination against measles*:

* A variable called `vacci_measles_doses` (Number of doses received) which is a numeric variable.
* Create a data validation rule to ensure that this variable remains between 0 and
  4.

- Translate newly added labels into French (see *Setup Options* ribbon).

- Check the setup for potential errors (see *Setup Options* ribbon).

> **ℹ Note**
>
> *You should normally have a configuration file identical to* `setup_measles_exercise_two.xlsb` *in the* `setup` *folder. You can also start from this file if you like.*

- Regenerate a new linelist named `linelist_measles_en_ex2` using the designer located in the `designer` folder. Save the linelist in the demo folder, making sure you've selected English as the language. You'll use the file `geobase-cod-2023-03-13_20230612.xlsx` in the `geobase` folder as your geobase.

> **⚠ Mac Users**
>
> Sometimes generating the linelist using a ribbon file can fail on Mac. In that case, it will default back to a linelist with button instead, but you should be able to pursue the exercices with this linelist. We are working to provide full support for Ribbon on Mac Os.
> You might experience screen flickering during the linelist creation process.

- You are now ready to migrate your data from the old to the new linelist. You need to proceed in 2 steps:

  - First, go back to the linelist `linelist_measles_en_ex1.xlsb` and remove all filters (see *Data Entry and Print* ribbon). Then, export the data (see *Admin* ribbon > *Advance Options > Export data*) to a location of your choice. This migration file contains all your data.
  - Second, go back to the new linelist `linelist_measles_en_ex2.xlsb` and import the migration file (see *Admin* ribbon > *Advance Options > Import data*). Look at the importation report and browse the data in the new linelist.

Exercise 3: Adding new Analysis

We've decided to add some analyses on the type of discharge (variable `outcome`) to the linelist.

- Open the setup file `setup_measles_base_ex3.xlsb` located in the `setup` folder.

- In the *Analysis* sheet, section *Univariate Analysis* add a univariate table showing the number of patients by type of discharge. Add percentages and a graph for this table.

- In the *Analysis* sheet, section *Time Series Analysis* add a temporal table showing the number of patient by type of discharge and notification date. Add percentages by row and add total.

- In the *Analysis* sheet, section *Labels for Time Series Graphs* add a graph title *Deaths*. In the section *Graph on Time Series* graph specifications, add the number of deaths per notification date, in bars.

- Translate newly added labels into French (see *Setup Options* ribbon).

- Check the setup for potential errors (see *Setup Options* ribbon).

> **i** Note
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> *You should get a configuration file identical to `setup_measles_exercise_three.xlsb` in the `setup` folder. You can also start from this file if you like.*

- Regenerate a new linelist named `linelist_measles_en_ex3` using the designer located in the `designer` folder. Save the linelist in the demo folder, making sure you've selected English as the language. You'll use the file `geobase-cod-2023-03-13_20230612.xlsx` in the `geobase` folder as your geobase.

- You are now ready to migrate your data from the old to the new linelist. You need to proceed in 2 steps:

  – First, go back to the linelist `linelist_measles_en_ex1.xlsb` and remove all filters (see *Data Entry and Print* ribbon). Then, export the data (see *Admin* ribbon > *Advance Options > Export data*) to a location of your choice. This migration file contains all your data.
  – Second, go back to the new linelist `linelist_measles_en_ex3.xlsb` and import the migration file (see *Admin* ribbon > *Advance Options > Import data*). Look at the importation report and browse the data in the new linelist.