

Using Tableau to Visualize COVID-19 Data

To repeat the old cliché' seeing is believing. Sometimes we must see a pattern before believing there is something worth reporting.

A pivot table that groups countries, sums the number of deaths by month and sub-divides the totals by month, may not reveal spikes or dips as apparently as a line graph or bar chart.

Interactive COVID-19 dashboards such as [this one](#) from Tableau Public have allowed users to process more information at one glance than would be the case if they were reading a story.

While there are many visualization programs, some are clearly better than others. Arguably, Tableau Public falls into the superior category, which is why we are taking the time for this introduction.

Though it may have a steeper learning curve than a popular tool such as [Datawrapper](#), Tableau Public packs more visual and analytical power in its ability to create a greater variety of visualizations, the calculated fields that we learned in our pivot table tutorial, and interactive dashboards.

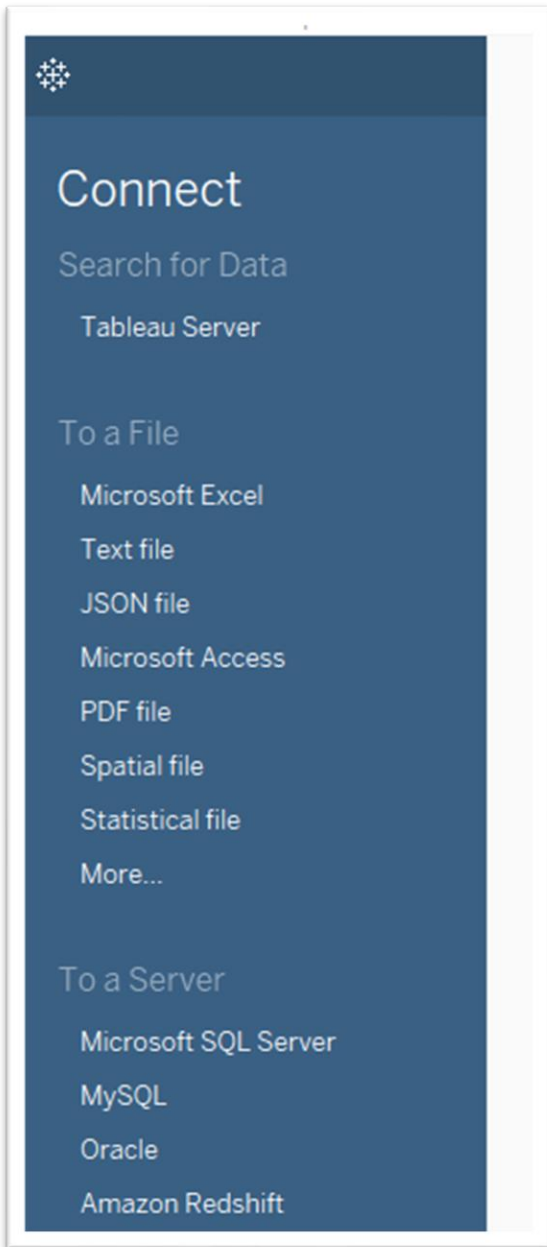
In this tutorial, we will work the COVID-19 data from the [European Centre for Disease Prevention and Control](#) website that was the subject of our first two Excel tutorials.

What we will learn:

1. Import tables into Tableau and format columns
2. Create worksheets (a map, and two bar charts for deaths and infections)
3. Create an interactive dashboard
4. Export and embed your graphic

1. Import tables into Tableau and format columns

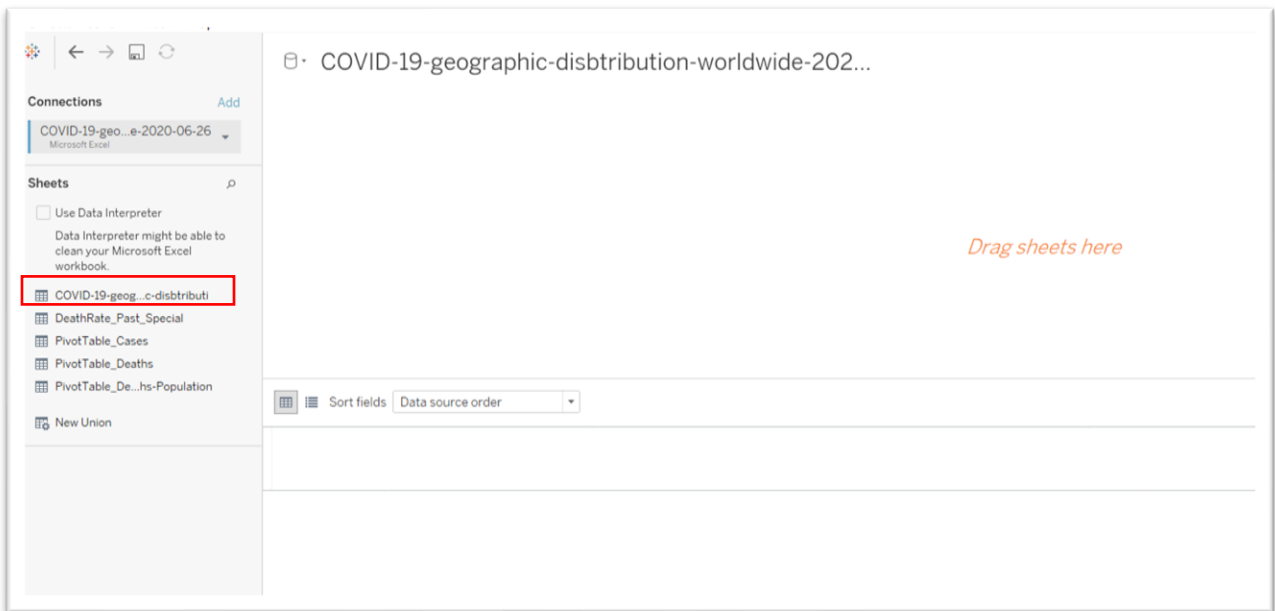
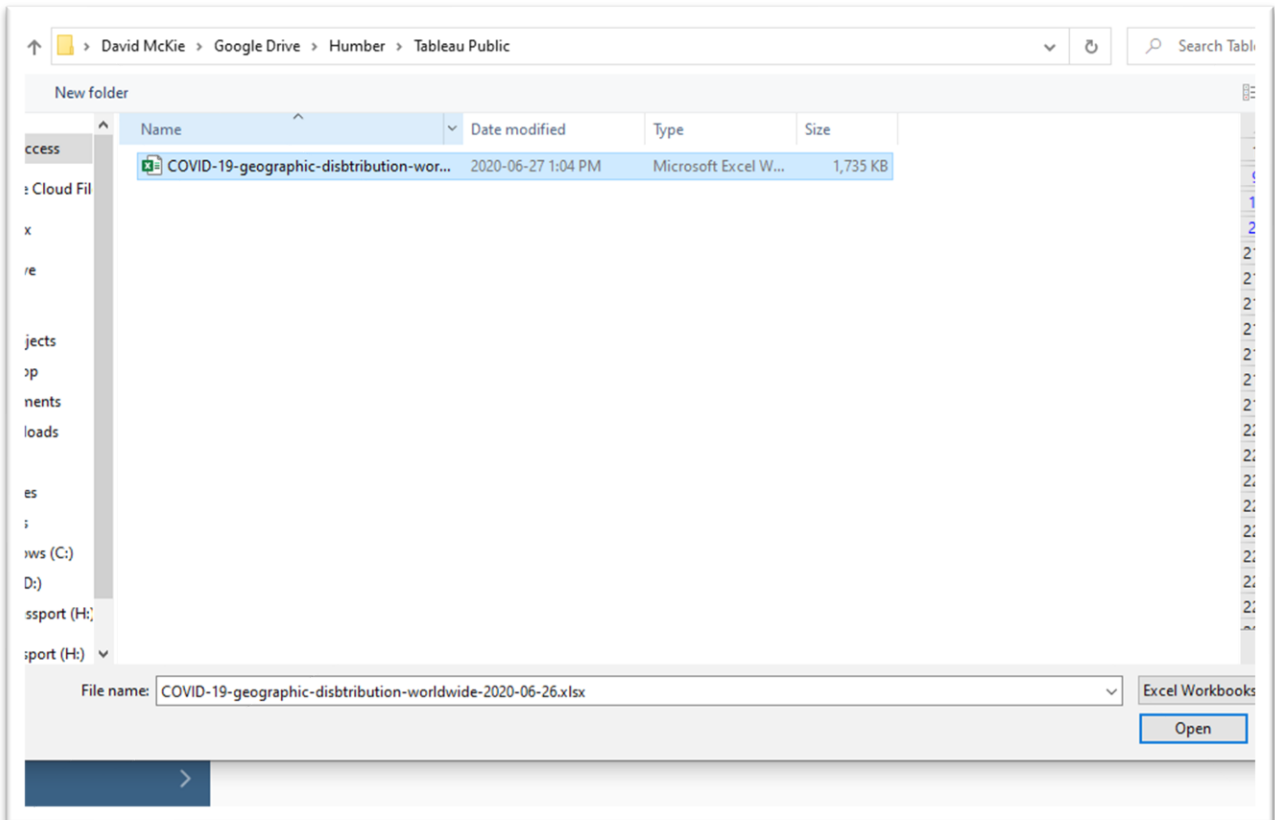
Open Tableau Public.



You will see this menu on the left-hand side.

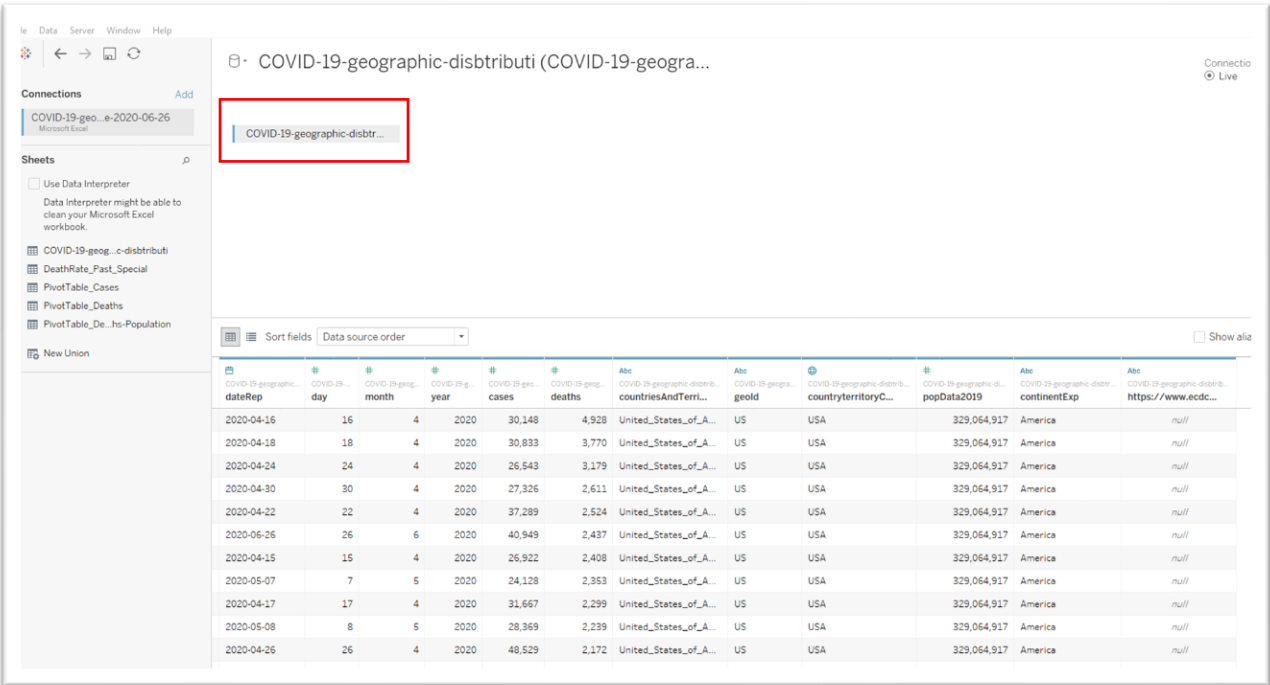
Select “Microsoft Excel.”

Browse to your folder that contains the COVID-19 Excel workbook from the first two exercises and select.



On your left are the sheets in the COVID-19 workbook. You can either select the original table, “COVID-19-geog...c distribut....” by clicking,

or drag it into the “Drag sheets here” section directly below.



Hover your cursor over the “COVID-19-geographic-disbtr...”: tab to the right and click the downward arrow, or caret, that appears.

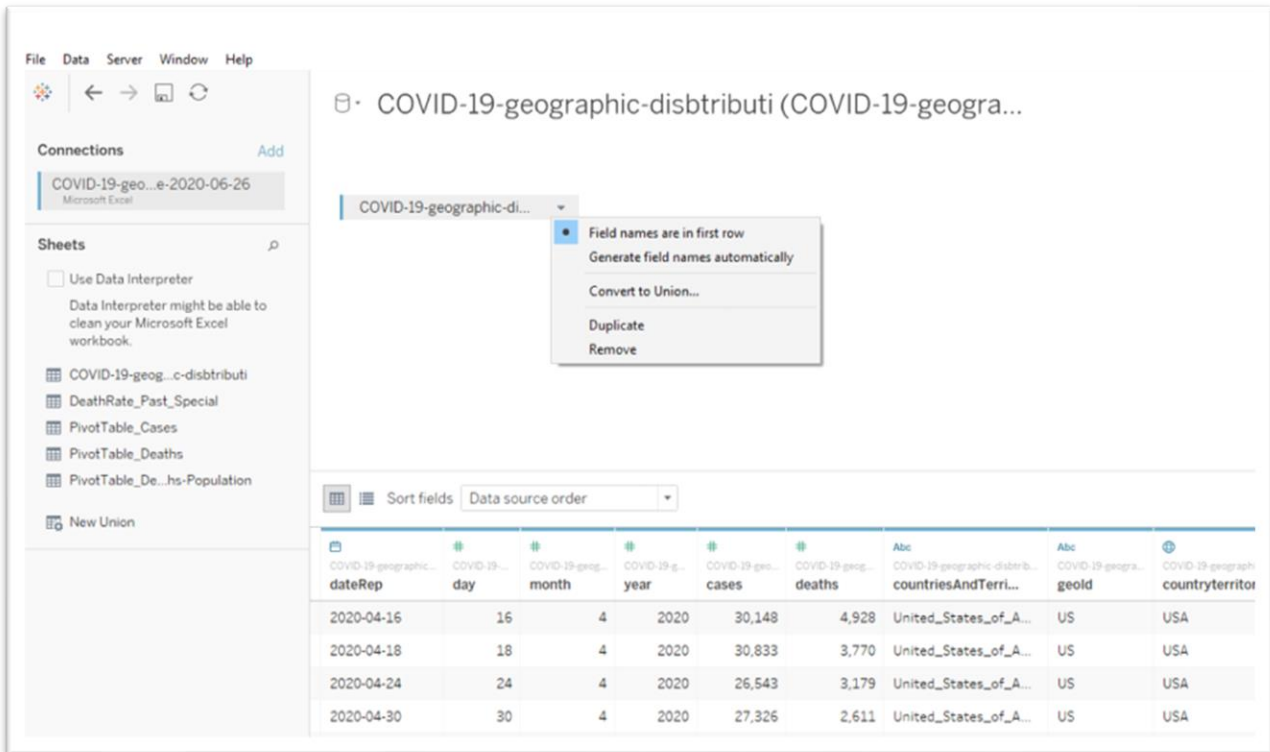
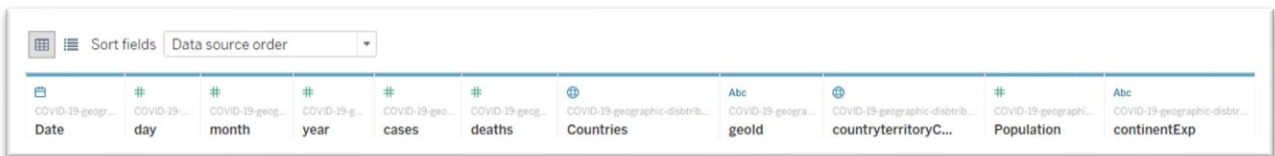
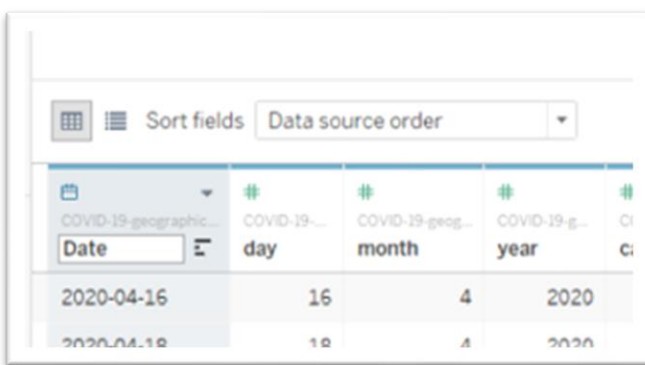


Tableau has assumed that you want the first field, cell in each row, to contain the titles. Because this is a clean dataset, the first row does, indeed, contain the column heads. Such would not be the case if we imported a dirty dataset, a no-no when working with data-visualization tools. The cleaner the data, the less work you have to do, though Tableau is equipped more than many of its competitors to do quite a bit of cleaning.

You can rename the column names by double-clicking the titles and typing.



Save the Tableau file in the same folder that contains your data.

Now, let's look at the column headings.

A closer look will reveal icons across the very top.



The icons tell you how the information in each column is formatted. Selecting the calendar-shaped icon above the date field produces a drop-

down menu (much like in Excel) that reveals the formatting.

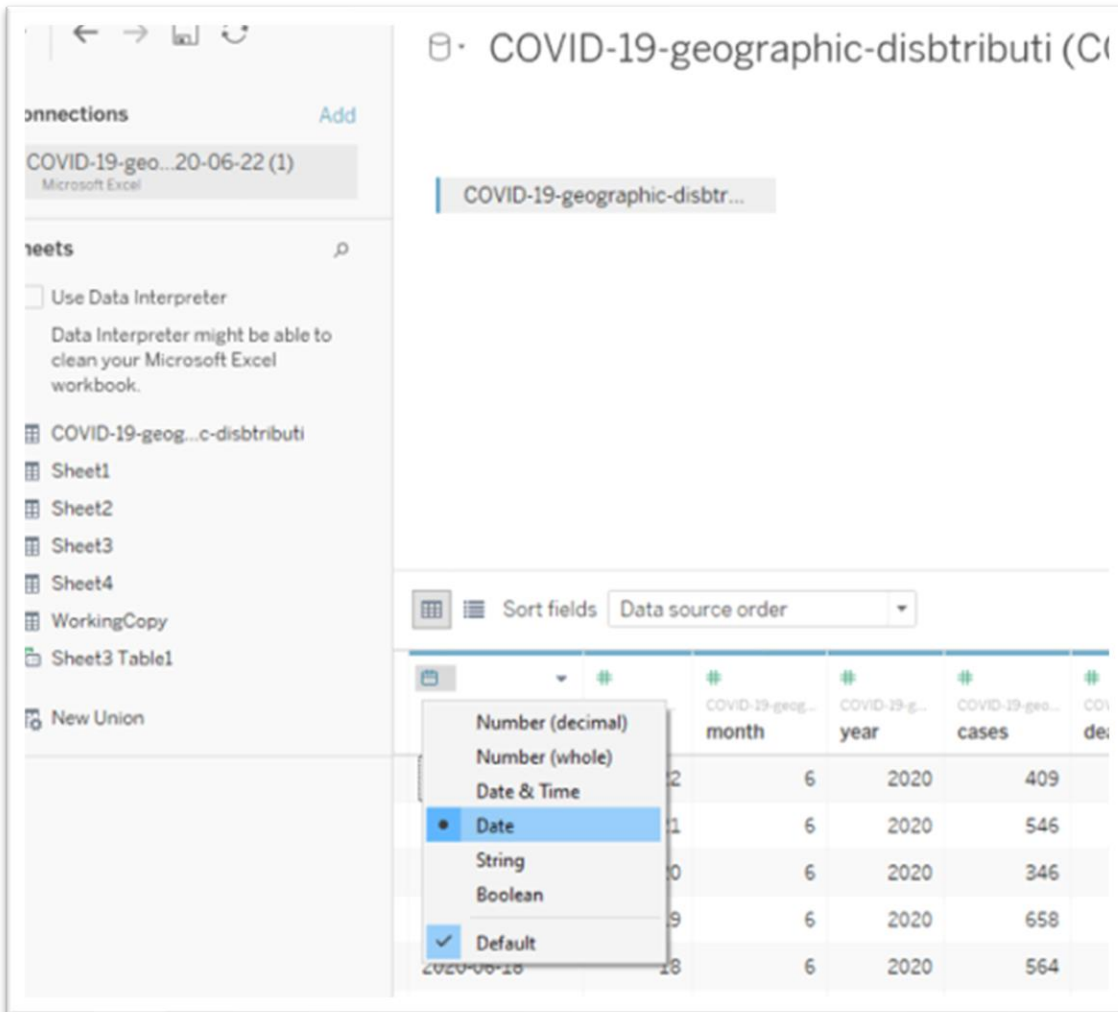


Tableau recognizes the data in the first columns as dates.

The hashtag icons (“#”) stands for a number, important because we’ll want to perform math on the numbers just like we did in Excel.

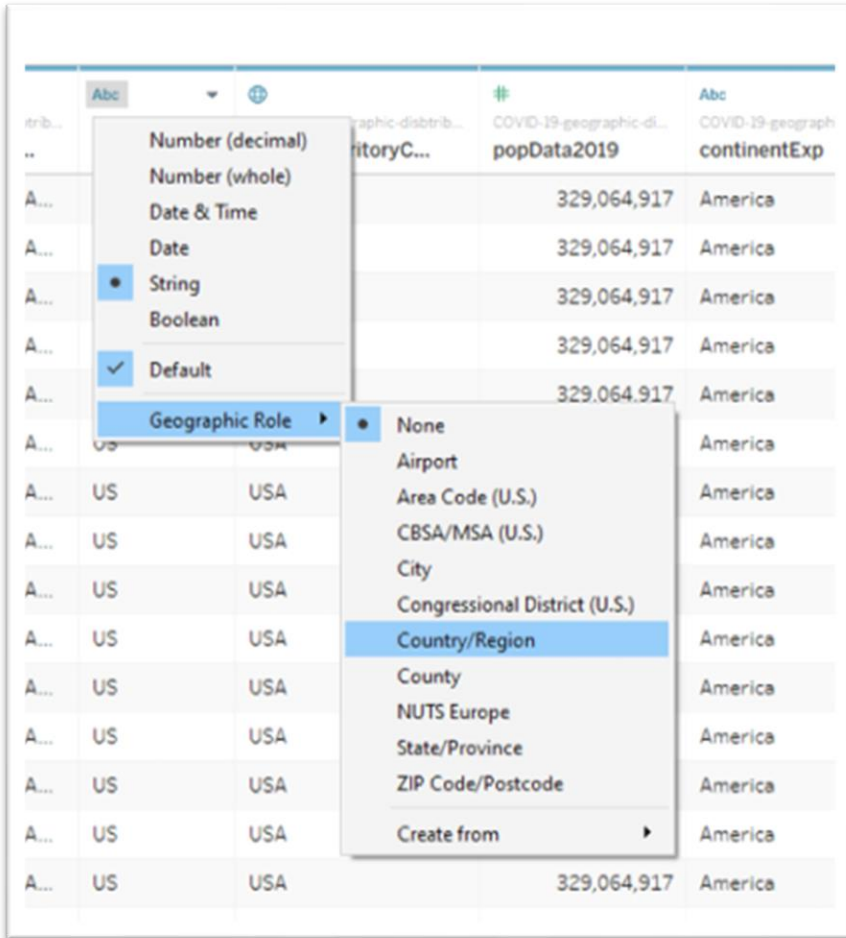
The “abc” icon above countries is a problem. Let’s click the icon to find out why.

#	Abc	Abc	COVID-19-geogra...	COVID-19-geogra...
	deaths	gold	COI	coi
	4,928	S	US	
	3,770	S	US	
	3,179	S	US	
	2,611	S	US	
	2,524	S	US	
	2,437	United_States_of_A...	US	US
	2,408	United_States_of_A...	US	US
	2,353	United_States_of_A...	US	US

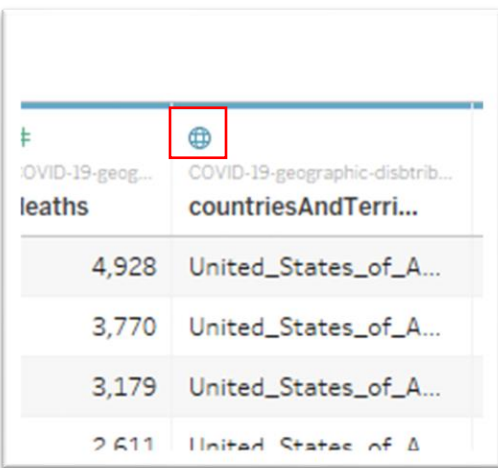
Tableau is interpreting the country names as a “String”, or text.

To allow Tableau to map the countries, we must change the formatting to a geographic marker.

Click the arrow to the right of “Geographic Role”.



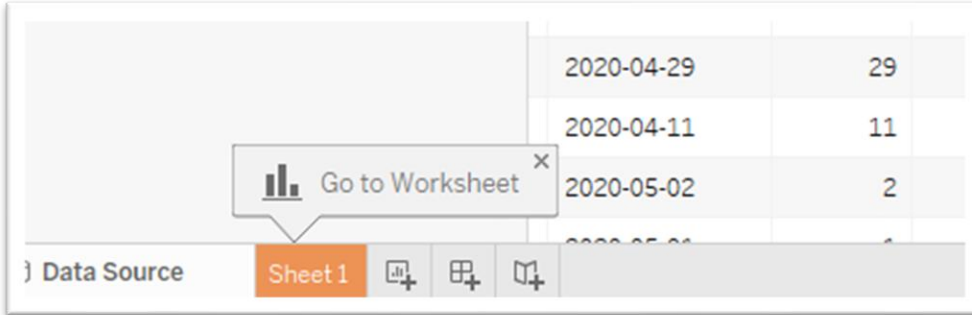
Select “Country/Region.”



The icon has changed to a globe. Exactly what we want.

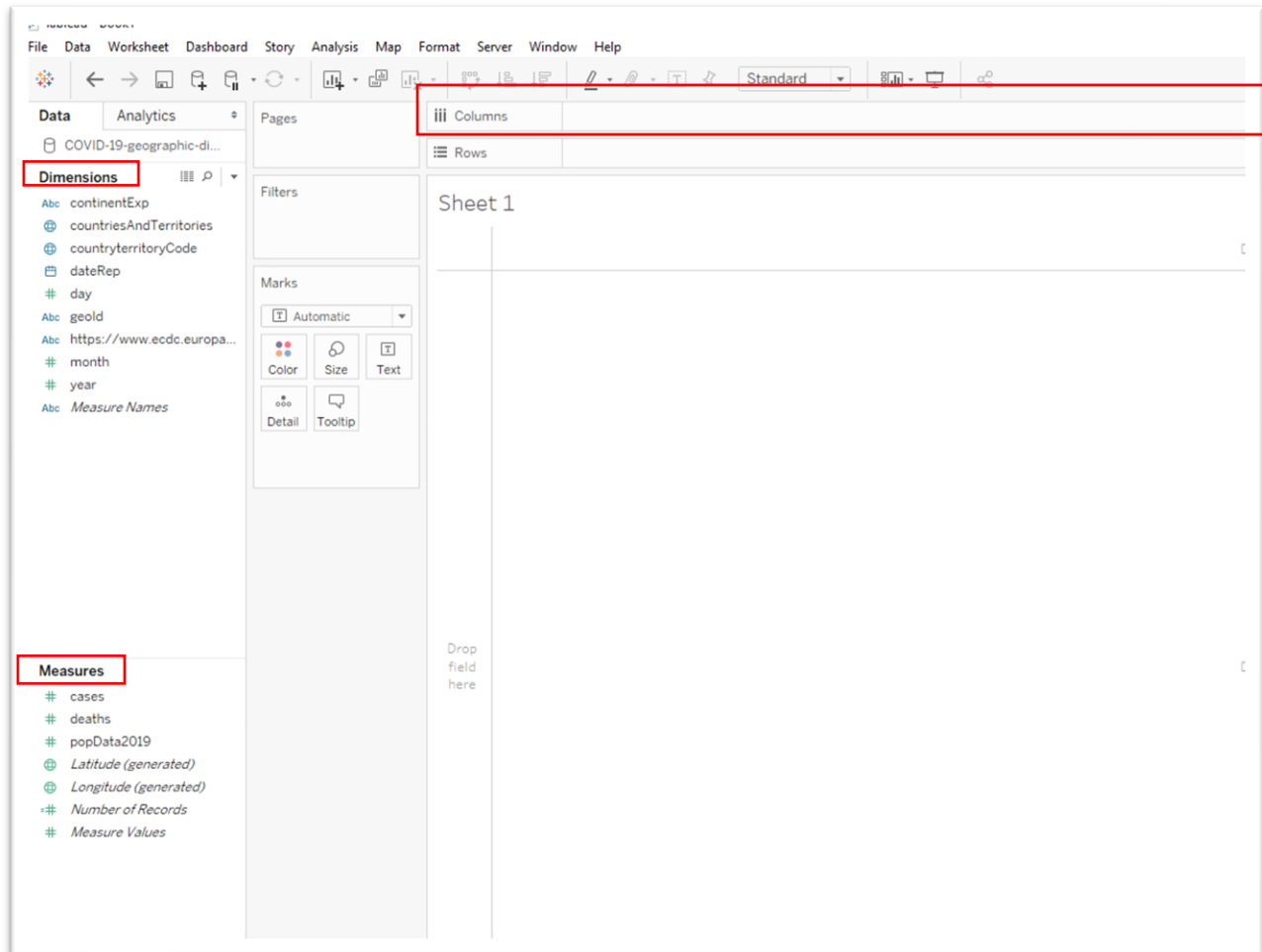
Formating for the other columns is fine.

At the bottom, you'll notice the first sheet ("Sheet 1") – similar to what you see in Excel -- is highlighted with a prompt.



2. Create worksheets (a map, and two bar charts for deaths and infections)

Click the worksheet.



This interface looks similar to a pivot table in reverse, with a large area for the table itself on the right side (instead of the left in Excel or Google Sheets) and a smaller, narrower space for the column names on the left (instead of the right side in Excel or Google Sheets).

Measures – at the bottom left – is for columns that contain numbers.

Dimensions is for columns that contain text. If anything is out of place – such as a number in the “Dimensions” section, you can simply drag the icon and drop it to the correct location.

Drag “Countries” and drop the column header into the largest space to your right.

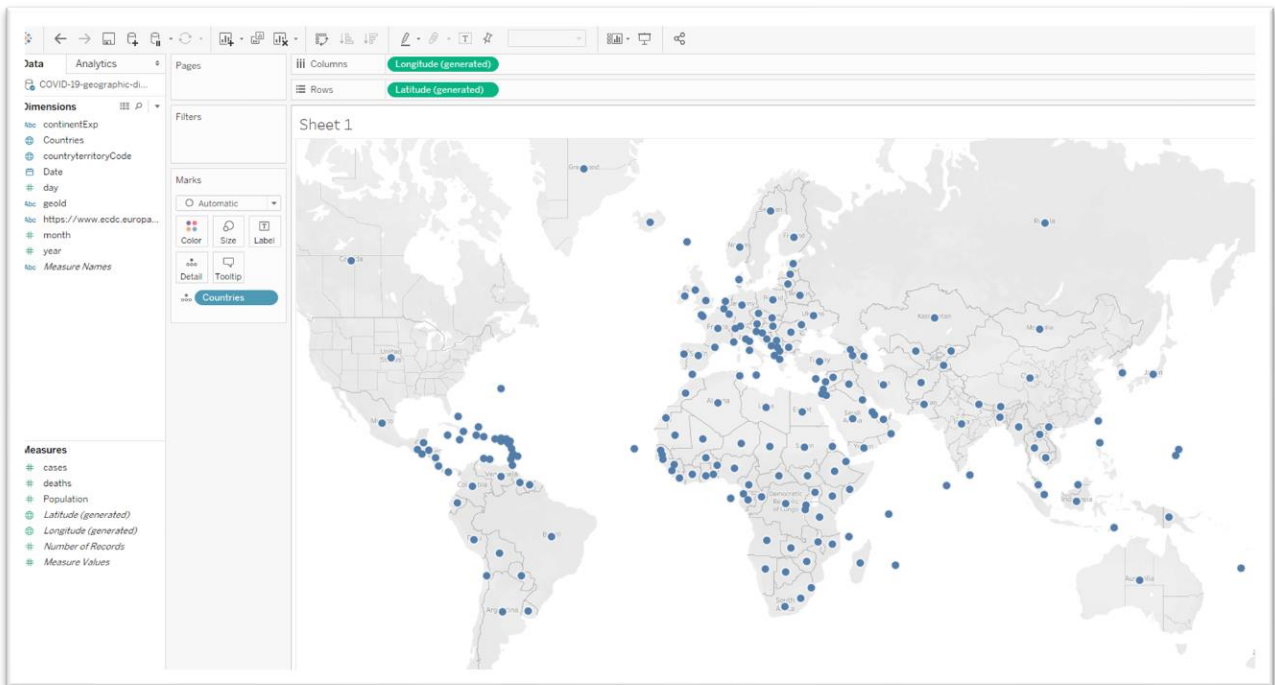
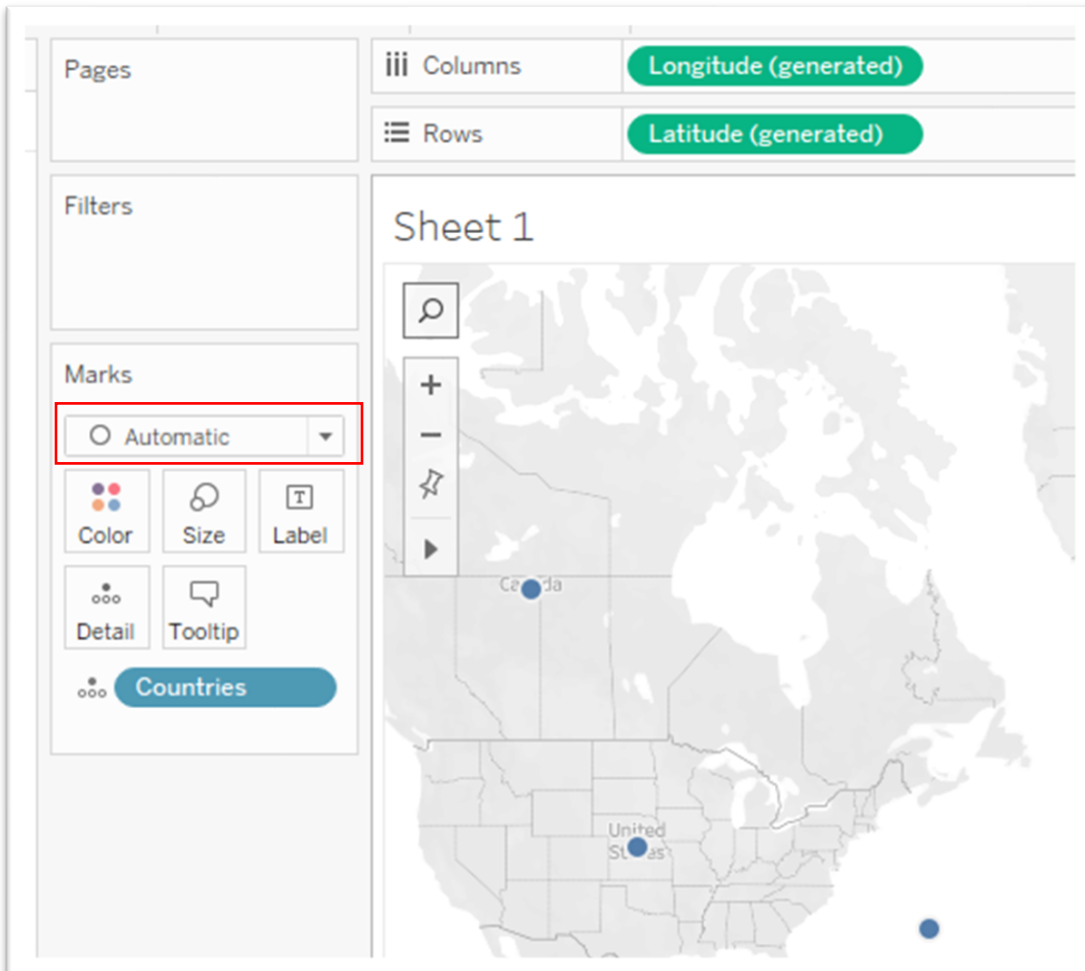


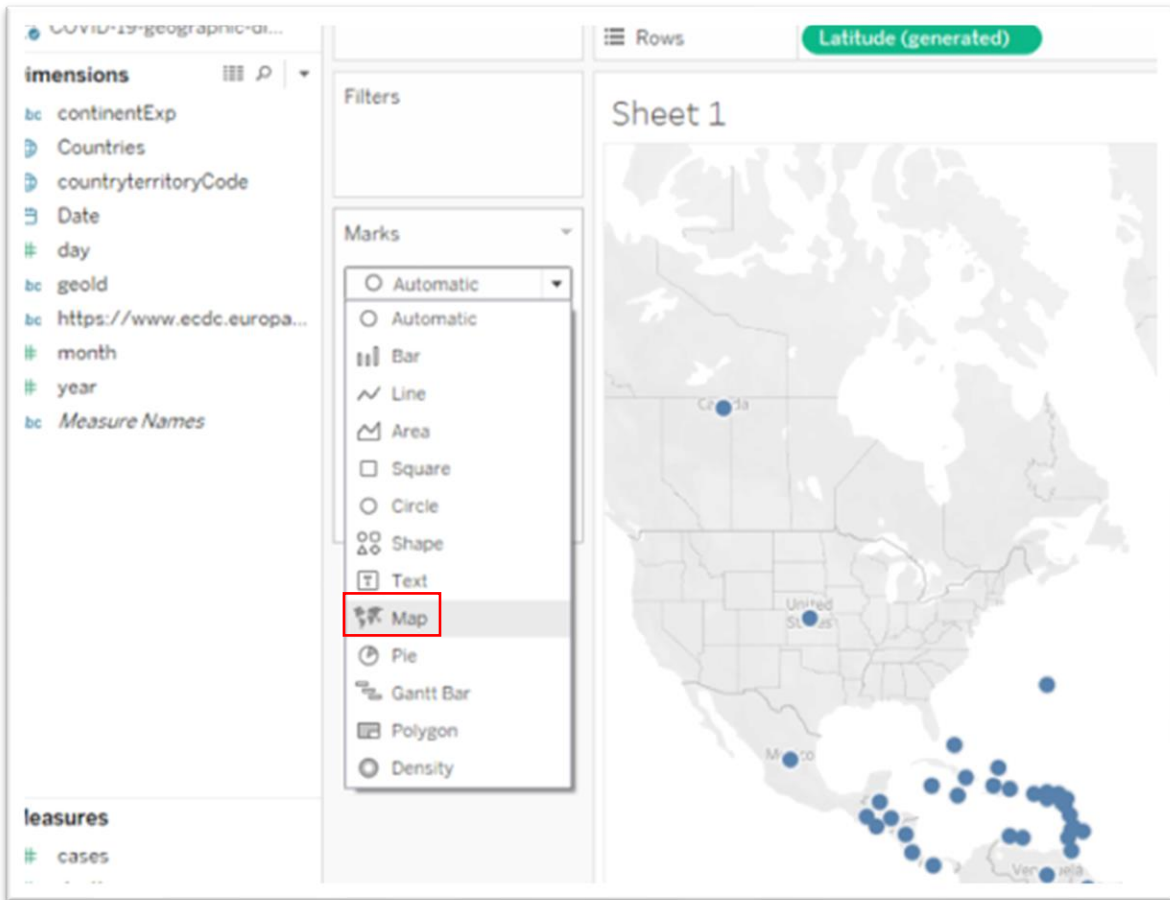
Tableau has placed the longitude and latitude coordinates in the columns and rows, respectively, resulting in the displayed map.

Instead of large dots, we may want a better visualization.

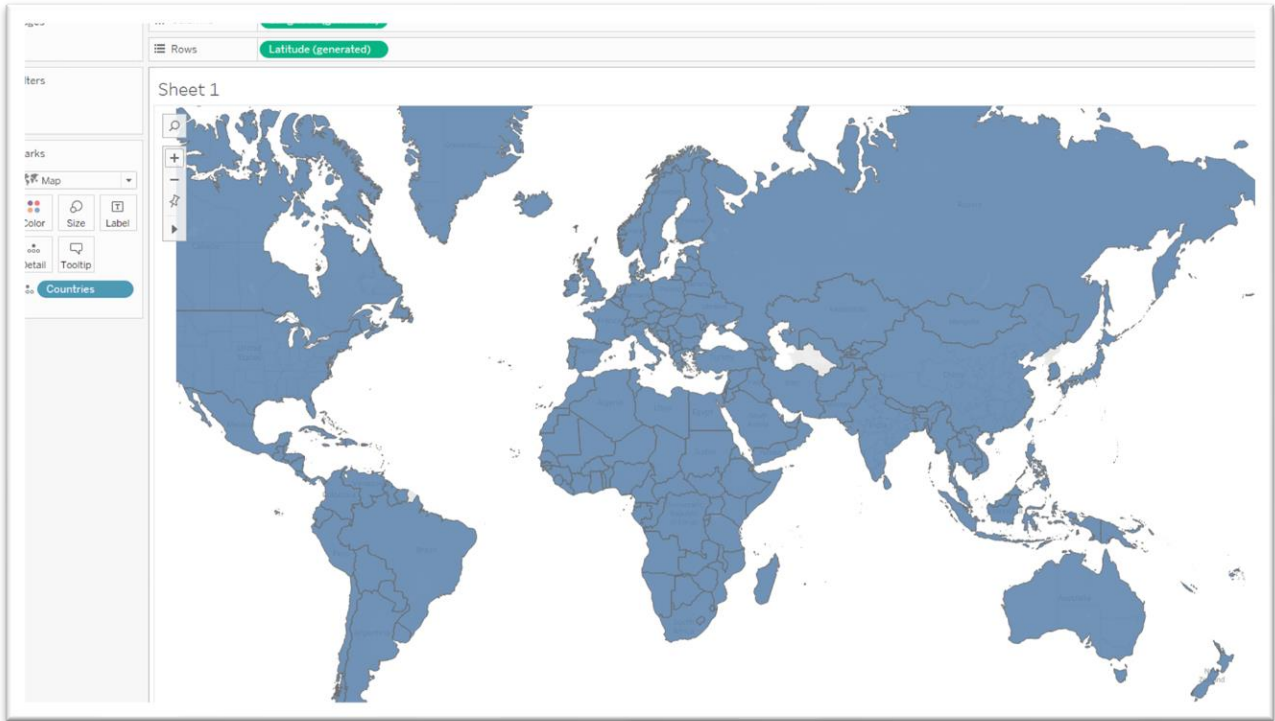
The heavy lifting is done in the menus to the immediate left of the large pane containing the map.



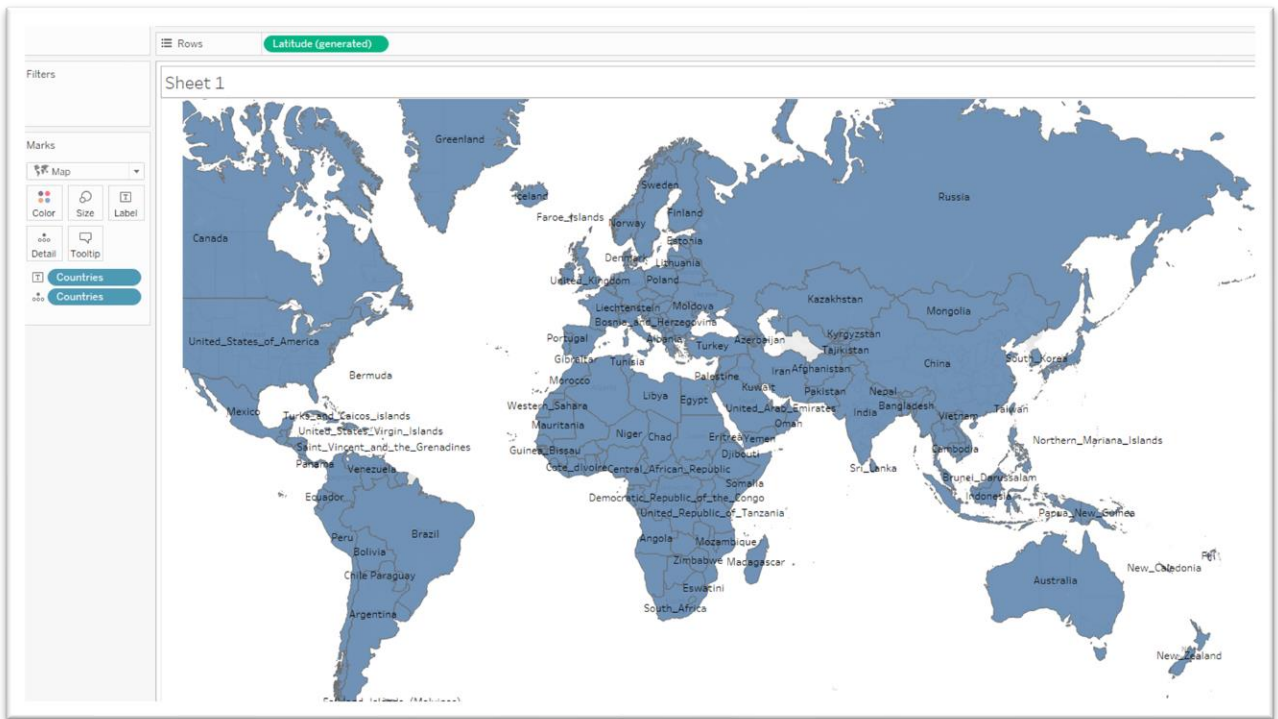
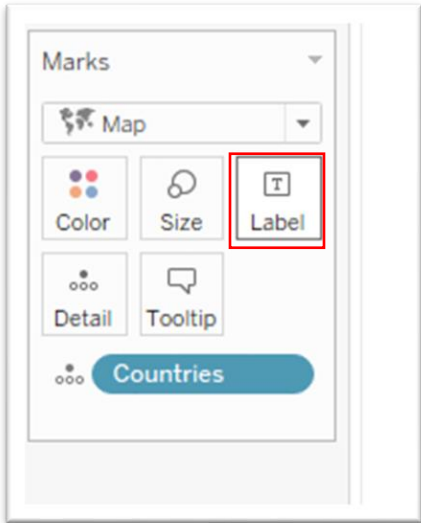
Click the arrow to the right of the “Automatic” tab under Marks.



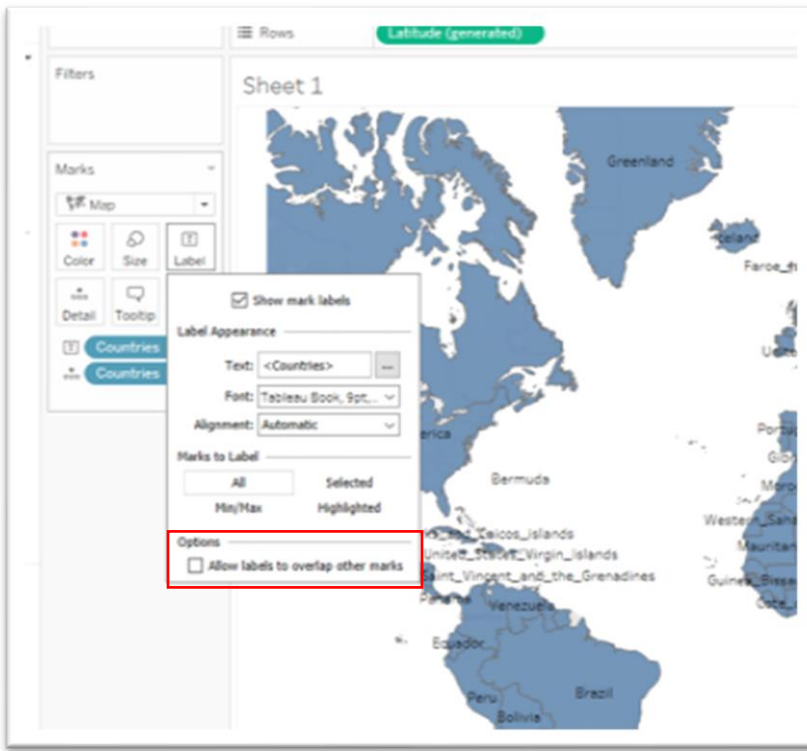
Select “Map”.



That looks better. To make the country labels appear, return to “Dimensions” and drag “Countries” into the “Label” section under “Marks.”



If you want to make sure that the country labels do not overlap, as is the case in this visualization, click the same icon to obtain a menu.



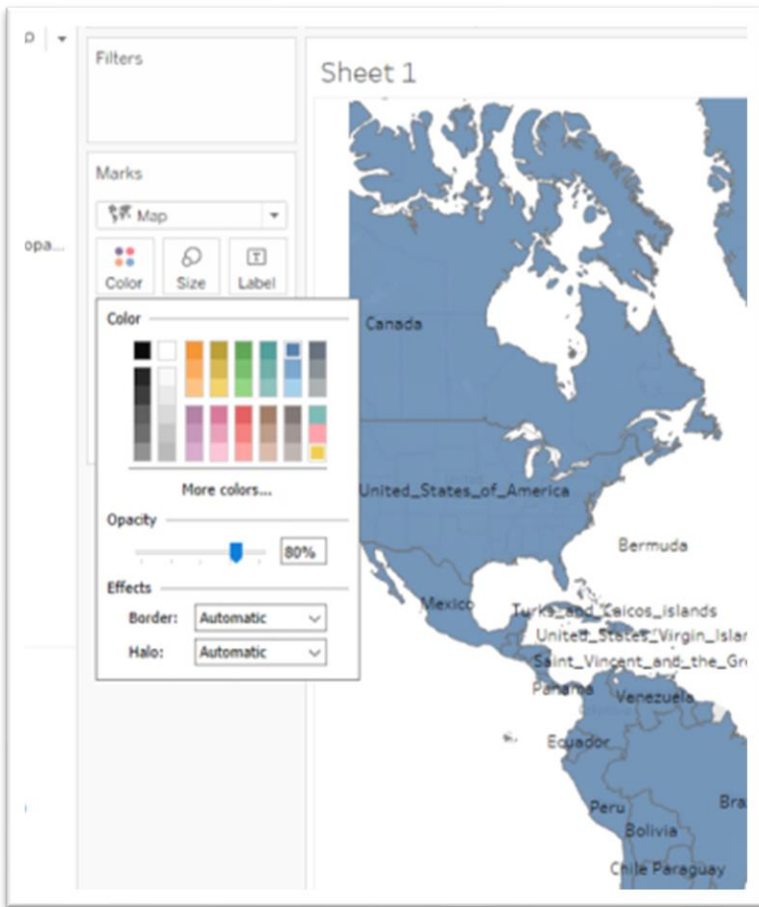
You'll notice that the box under "Options" allowing the labels to overlap is unchecked. Checking it produces a mess that looks like this.



Needless to say, this is an appealing look.

Uncheck the box.

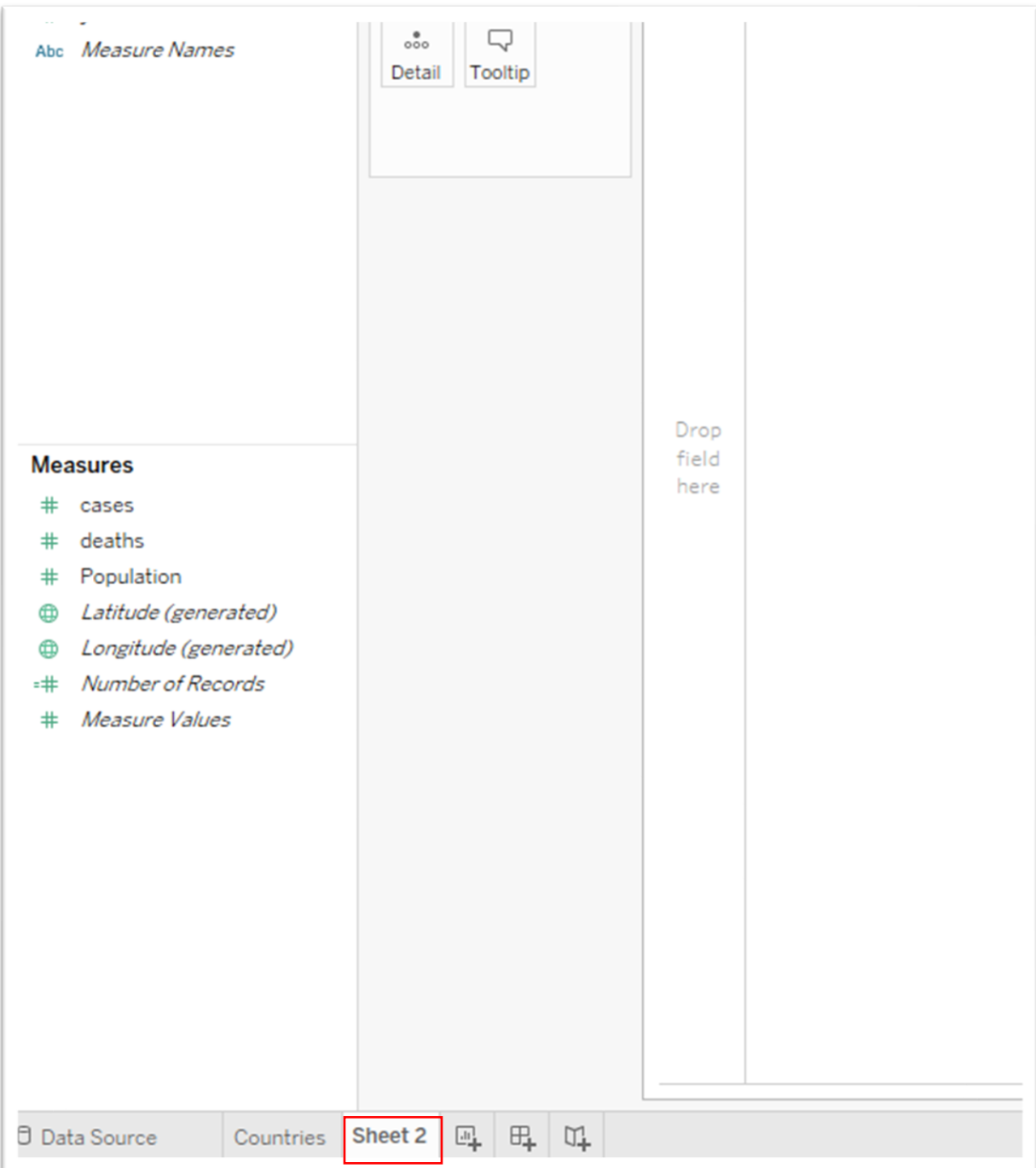
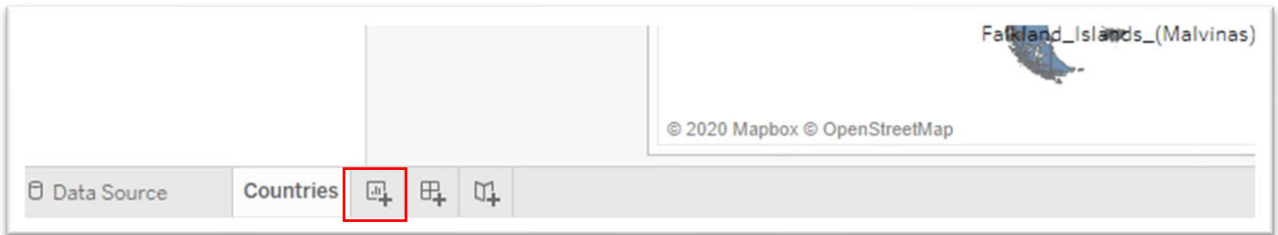
You can also change the colour by clicking the “Color” icon in the same section.



Let's leave the colour as is.

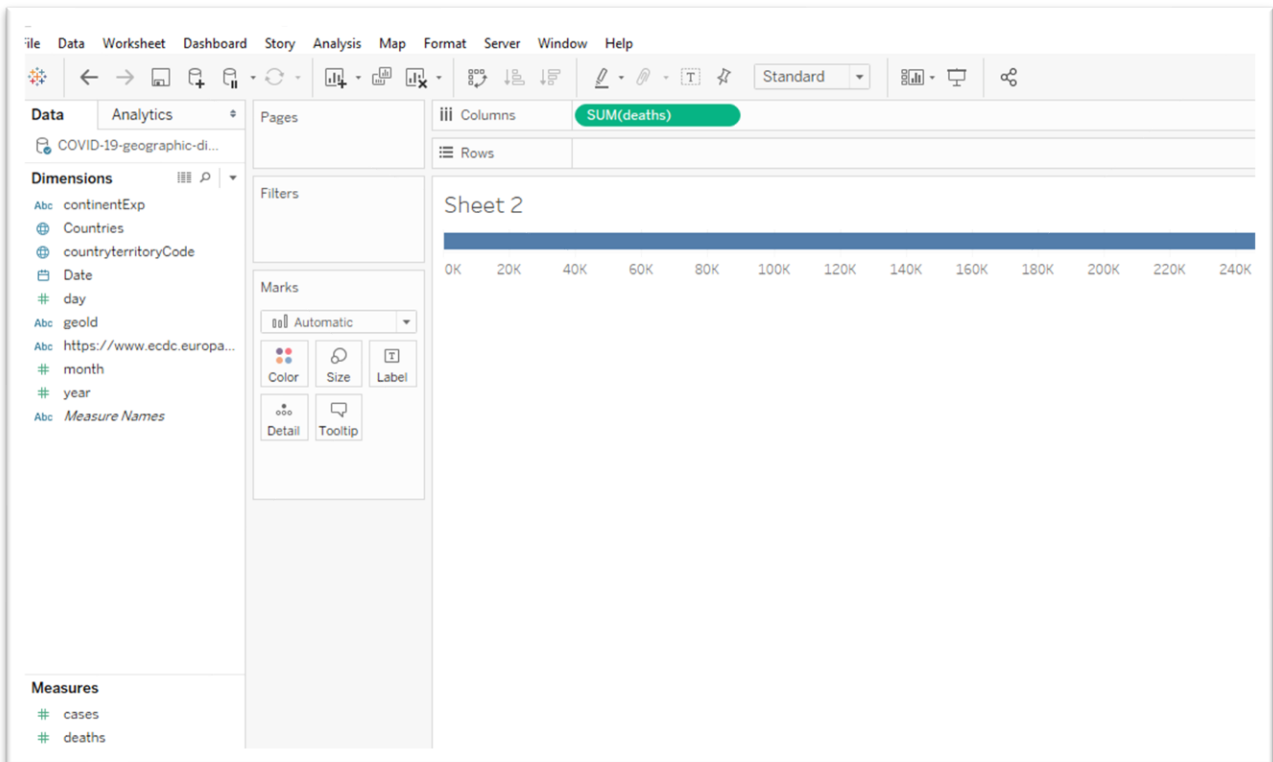
Label the worksheet “Countries.”

Open a second worksheet.

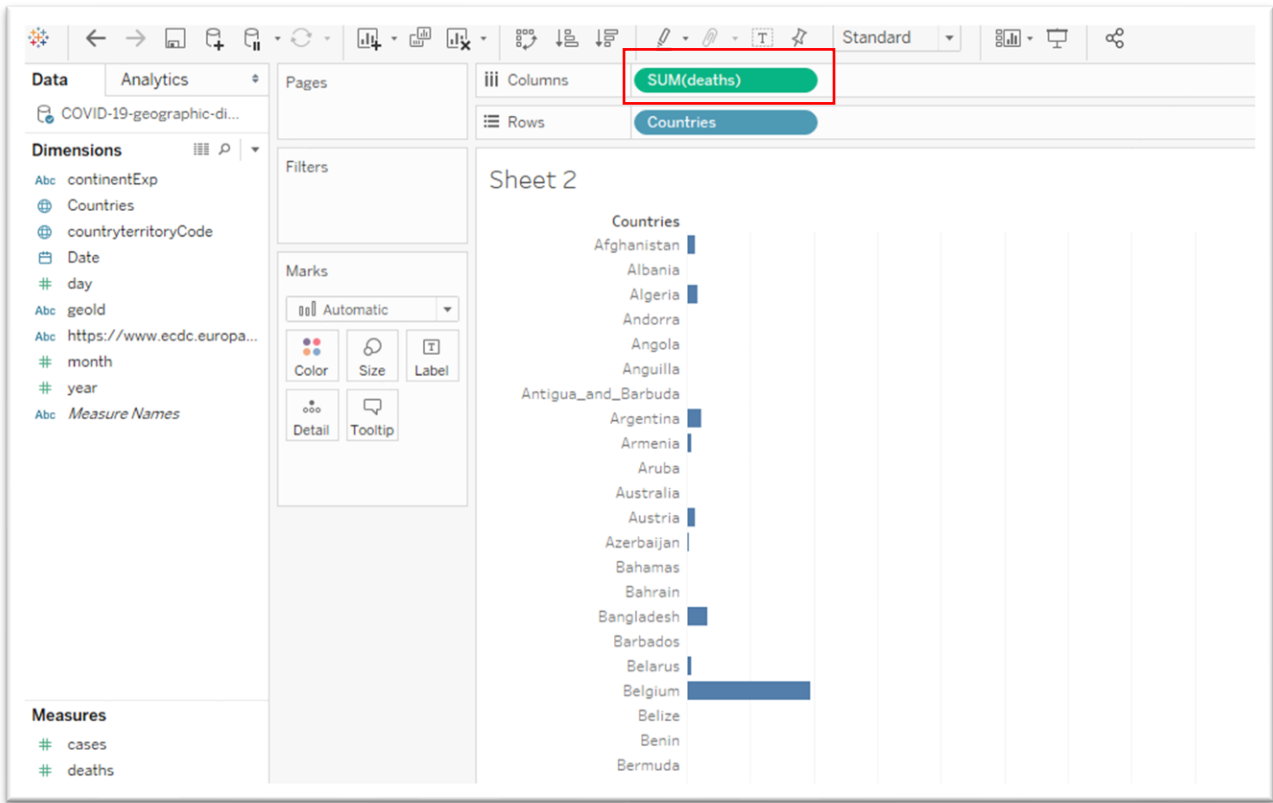


We'll create a vertical bar chart tracking deaths per country.

Drag “#deaths” from measures and drop it into the “Columns” section.

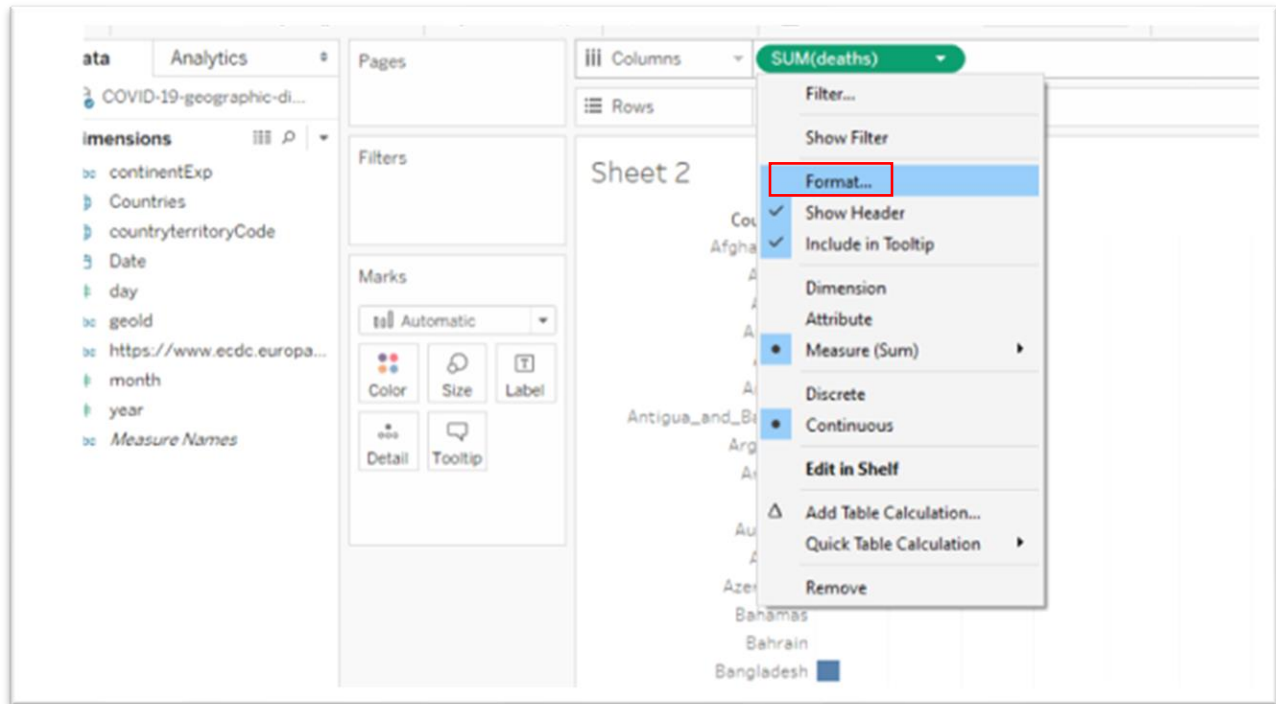


Drop “Countries” into “Rows.”

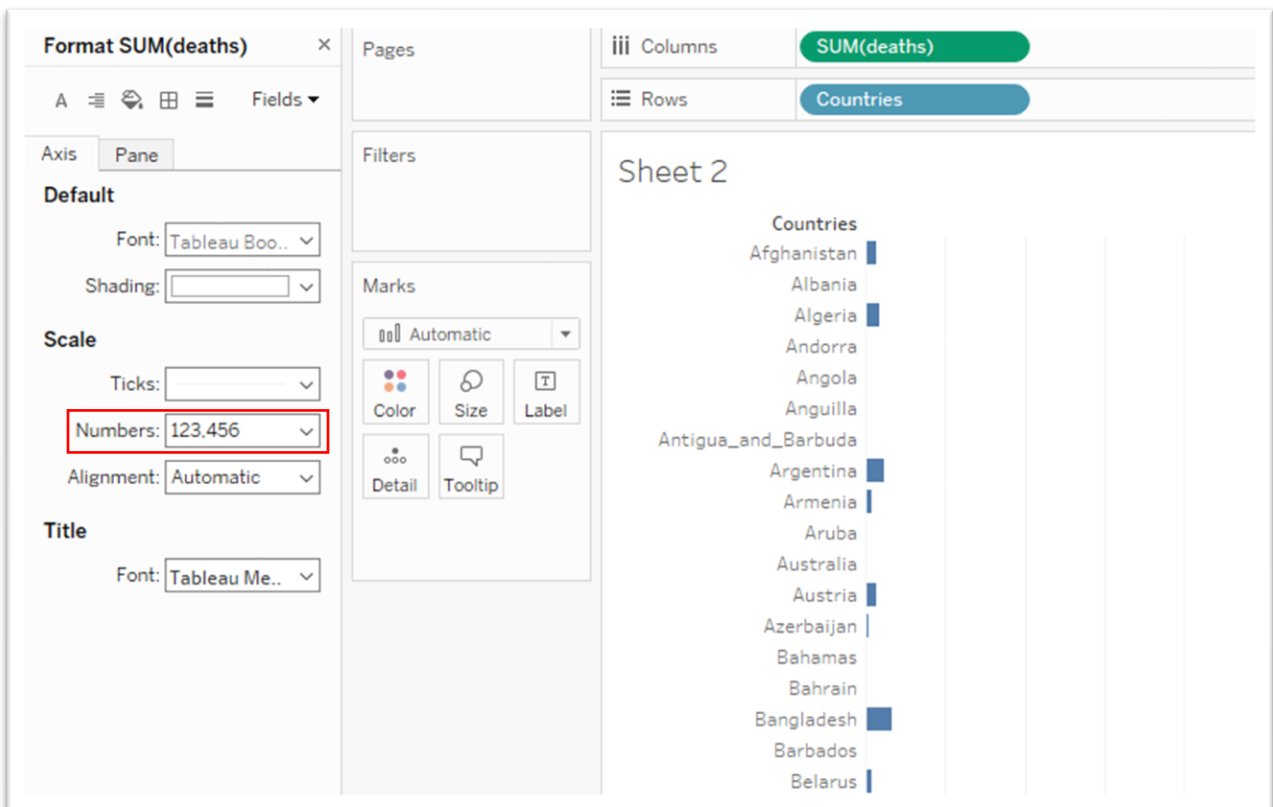


Reformat the death numbers by hovering your cursor over the “SUM(deaths)” tab next to “Columns”, click on the downward arrow that will appear on the right.

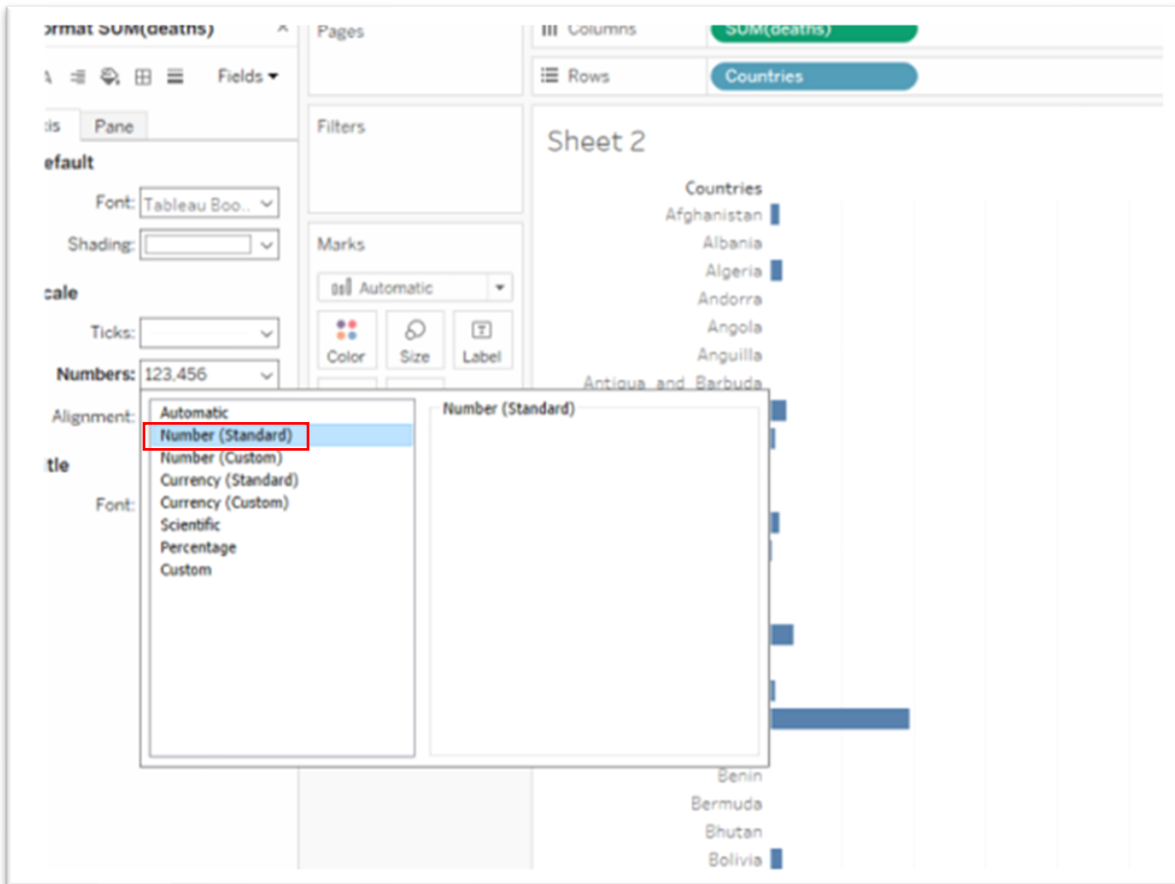
Select “Format” from the shortcut menu.



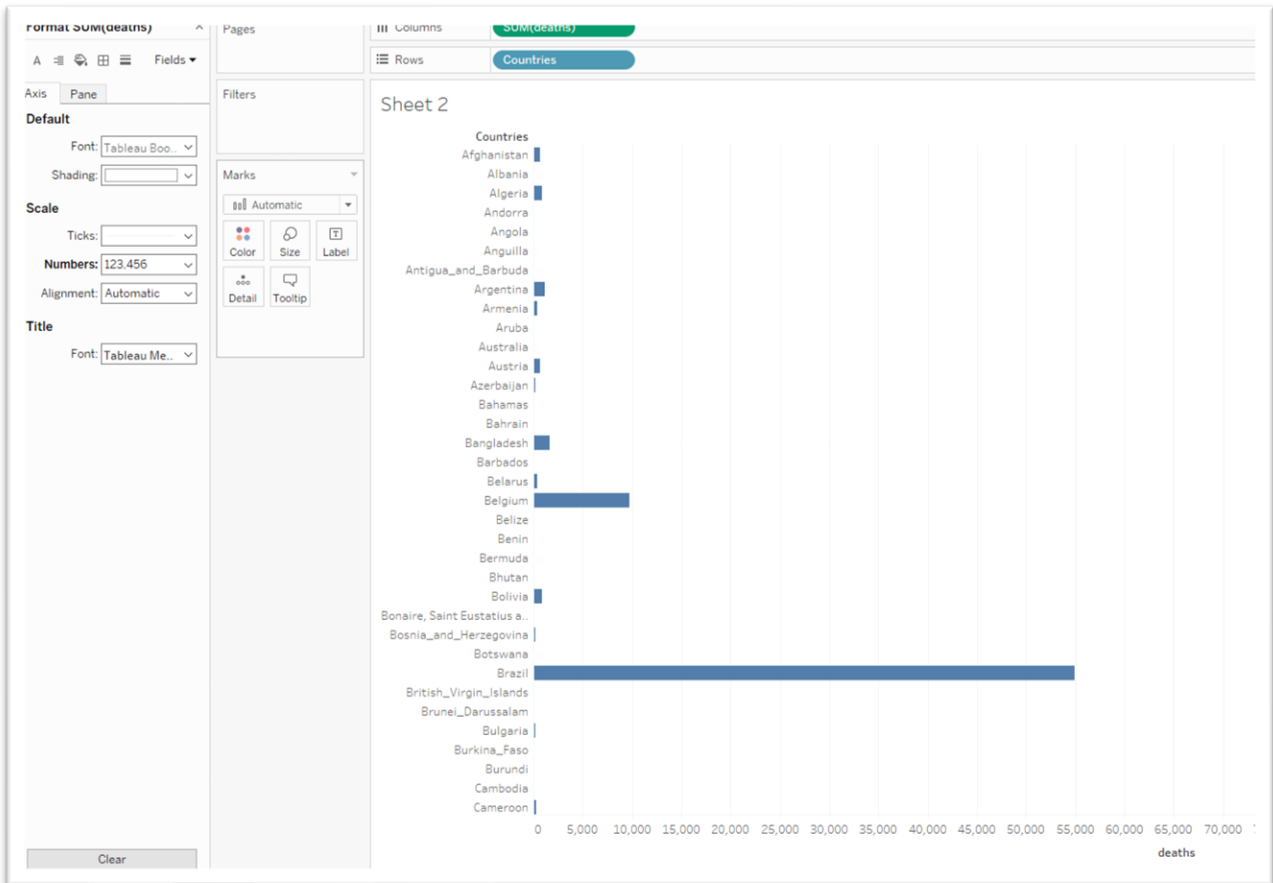
A new “Format” menu will appear on the left.



Click the arrow to the left of numbers highlighted in the screen grab above.



Choose “Number (Standard)” from the shortcut menu.



If you're happy with the result, close the format menu by clicking the “X”.

tableau - COVID-19 infections and deaths_for tutorial

File Data Worksheet Dashboard Story Analysis Map Format Server Window Help

Format SUM(deaths) Columns SUM(deaths)

Rows Countries

Axis Pane

Default

Font: Tableau Boo..

Shading:

Scale

Ticks:

Numbers: 123,456

Filters

Marks

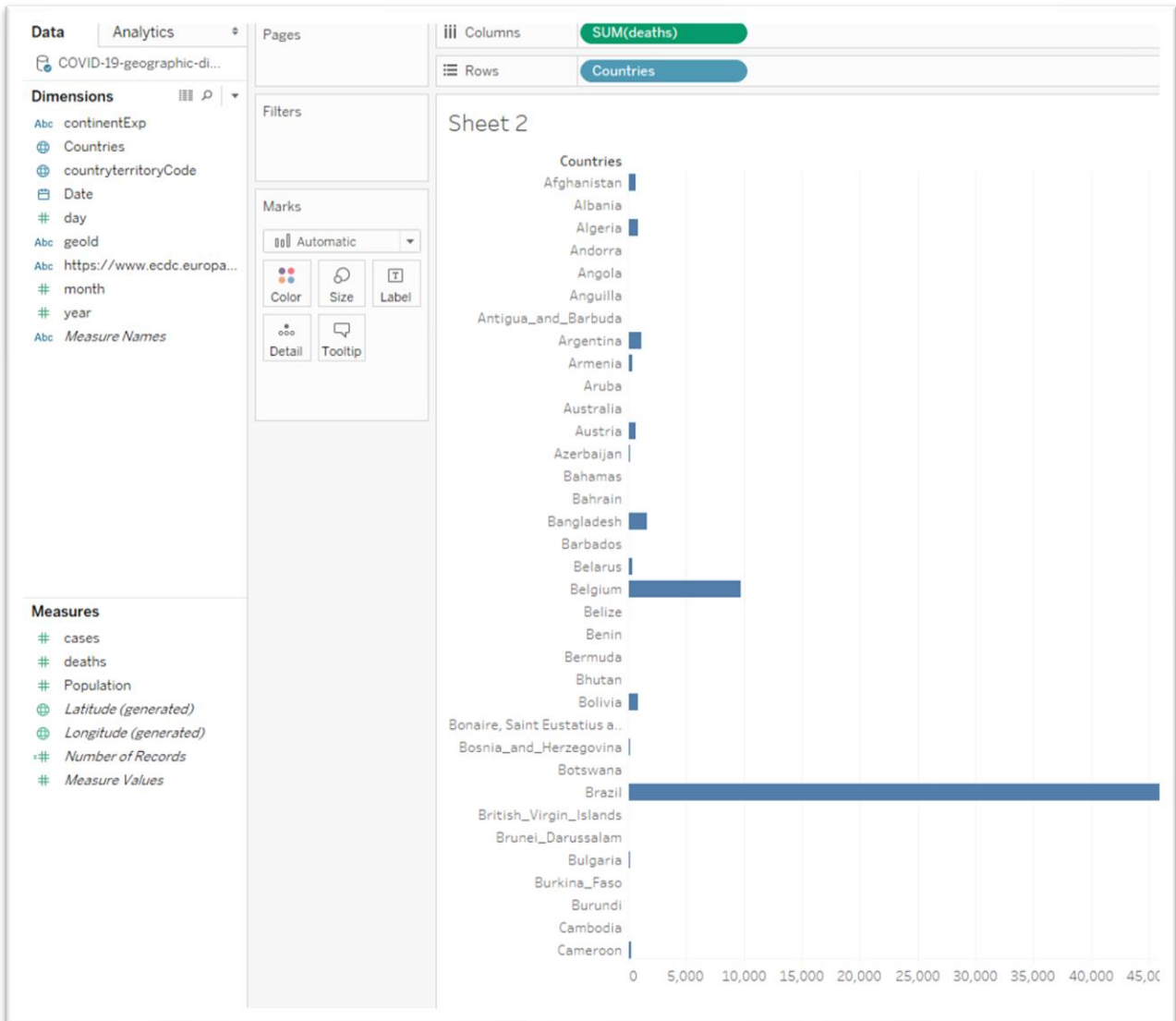
Automatic

Color Size Label

Sheet 2

Countries

- Afghanistan
- Albania
- Algeria
- Andorra
- Angola
- Anguilla
- Antigua_and_Barbuda
- Argentina



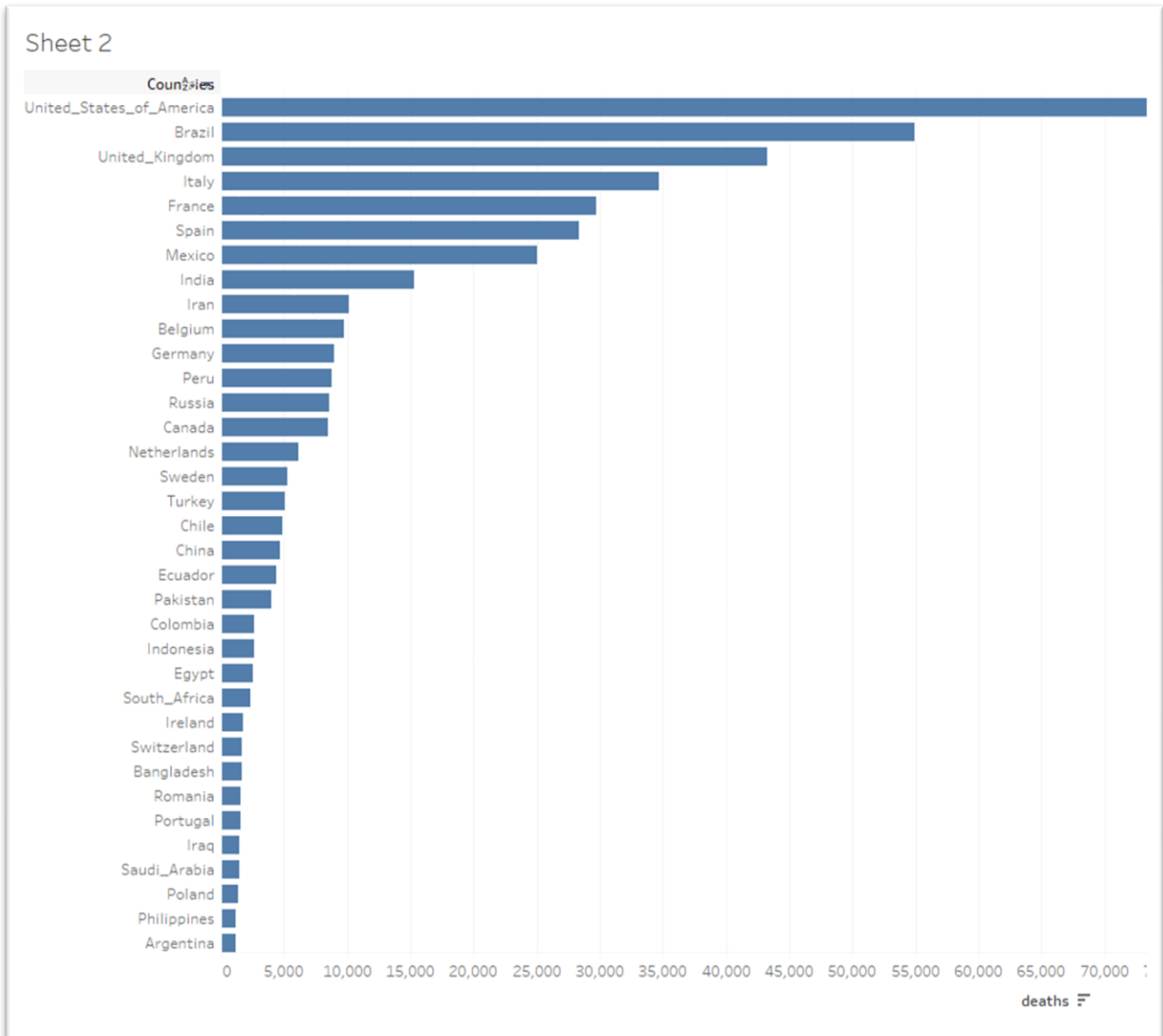
Hover your cursor over the “deaths” label below the table’s X-axis below the number “65,000”



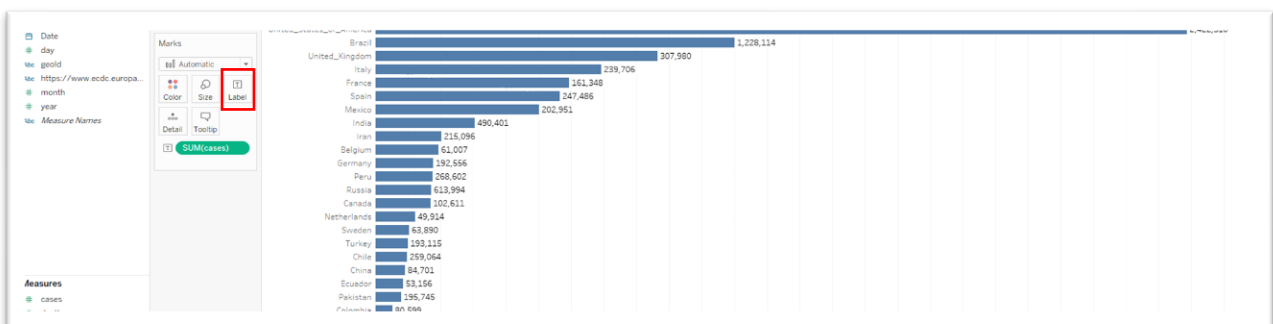


Nested Sort on Countries, descending by sum of deaths.

Sort in descending order.



If you want the labels to appear at the end of each bar, drag “#deaths” into the “Label” tab under “Marks”.



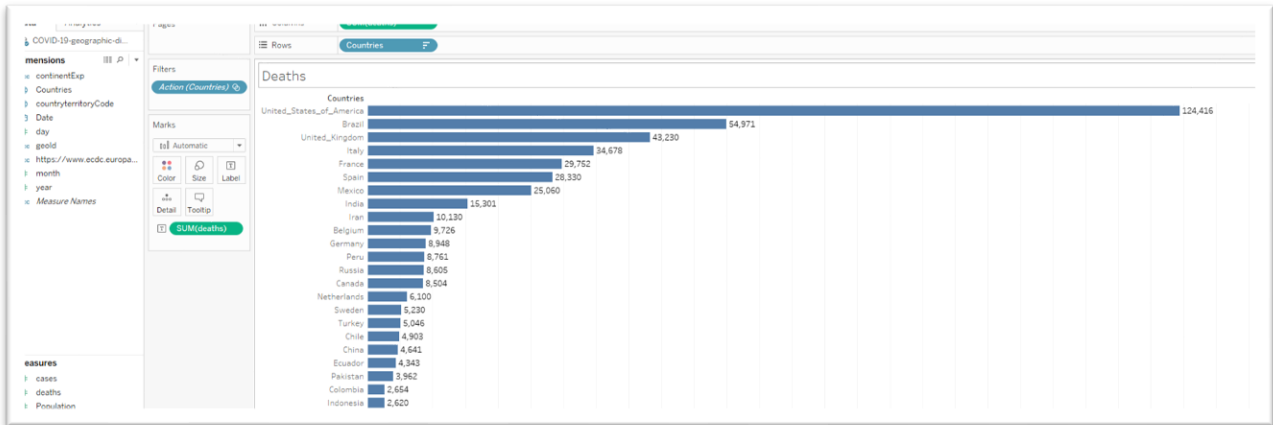
You can also play around with the colour, just like we did for the map.

If you're happy with this result, name the worksheet "Deaths."

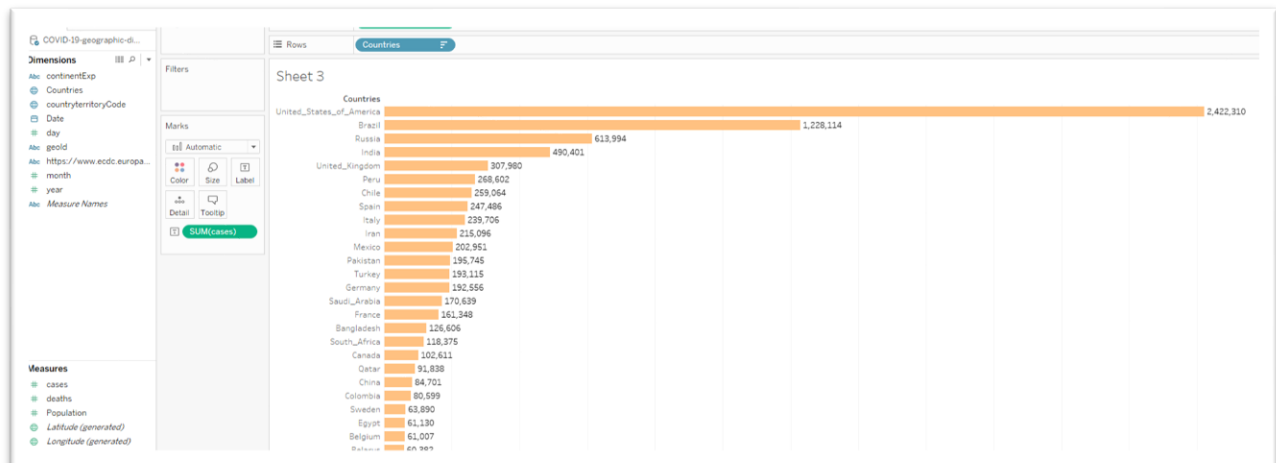
Be sure to save your work as you go.

Create a new worksheet for the "cases" or infections.

Repeat the steps we used to create the previous deaths table.



We can also change the colour.

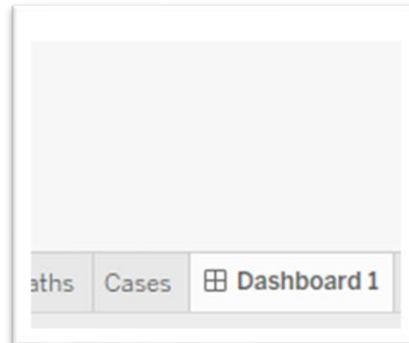
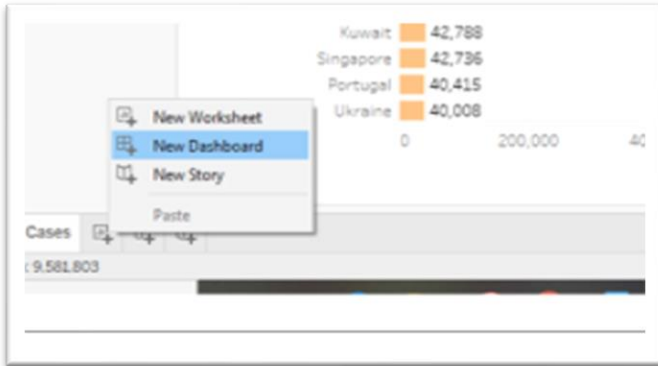


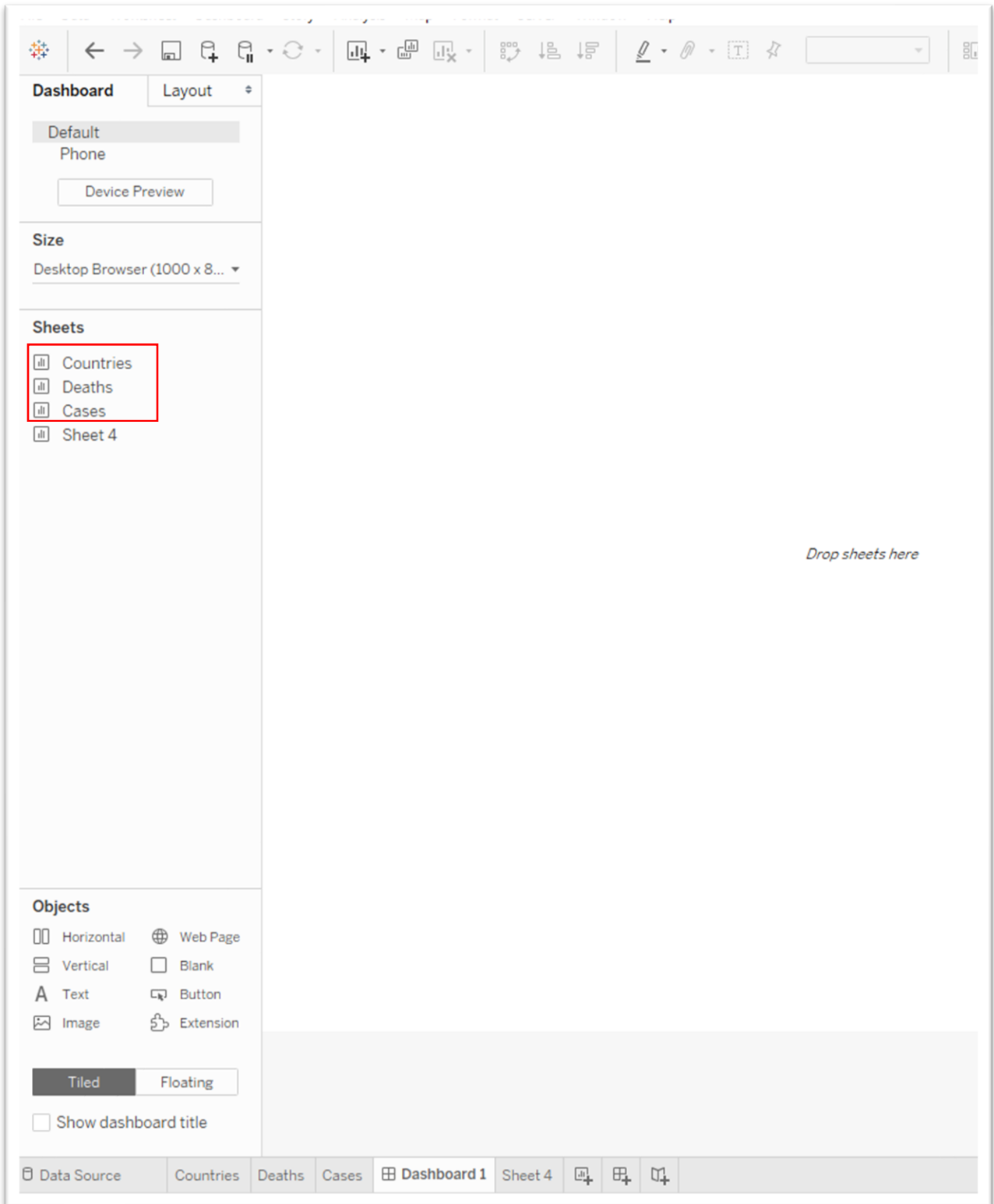
3. Create an interactive dashboard

Now it's time to create our interactive dashboard, the place where the real visualization happens.

The dashboard will combine our three visuals: map, death graph and cases graph.

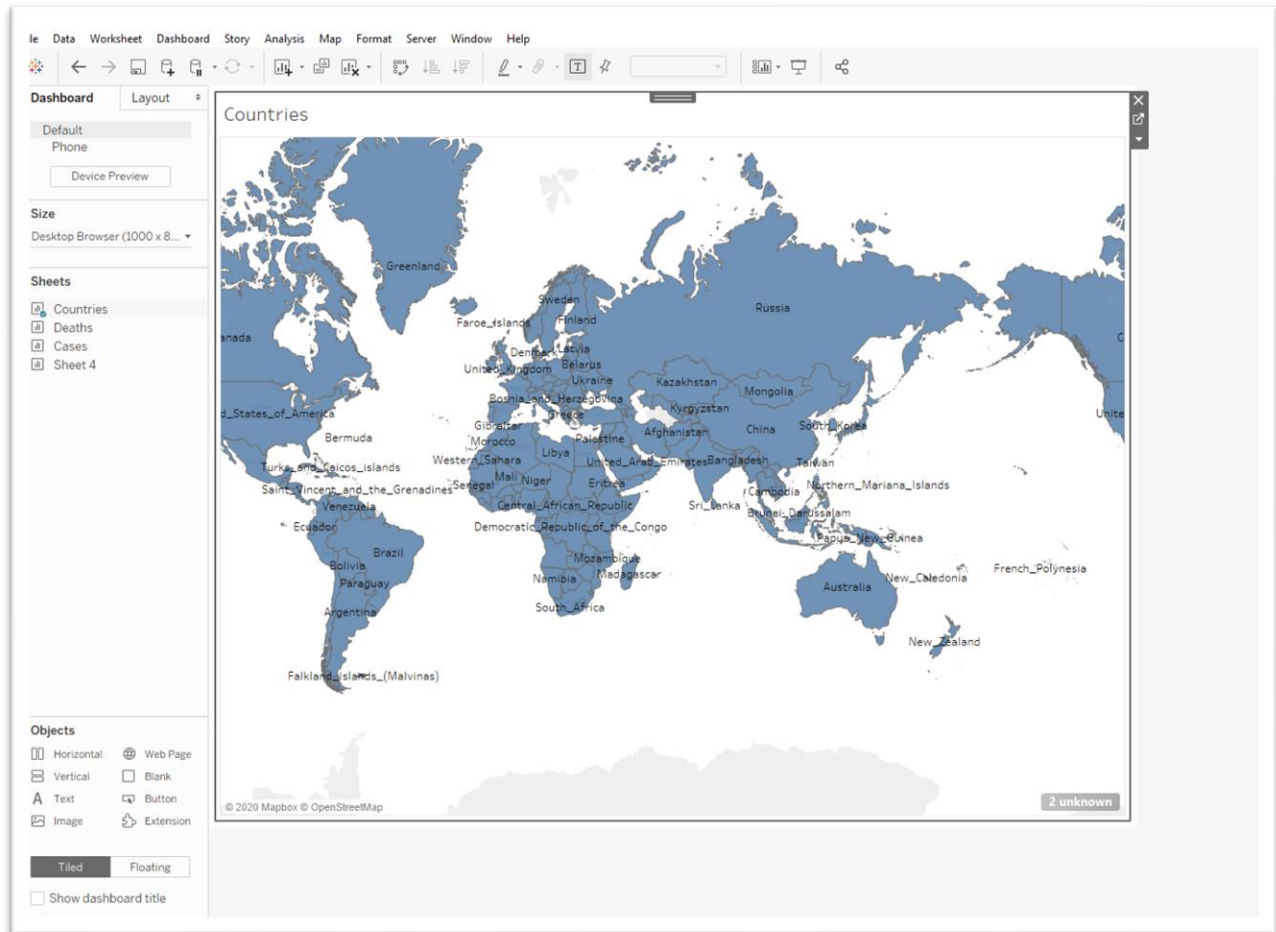
Instead of a worksheet, we'll add a dashboard.



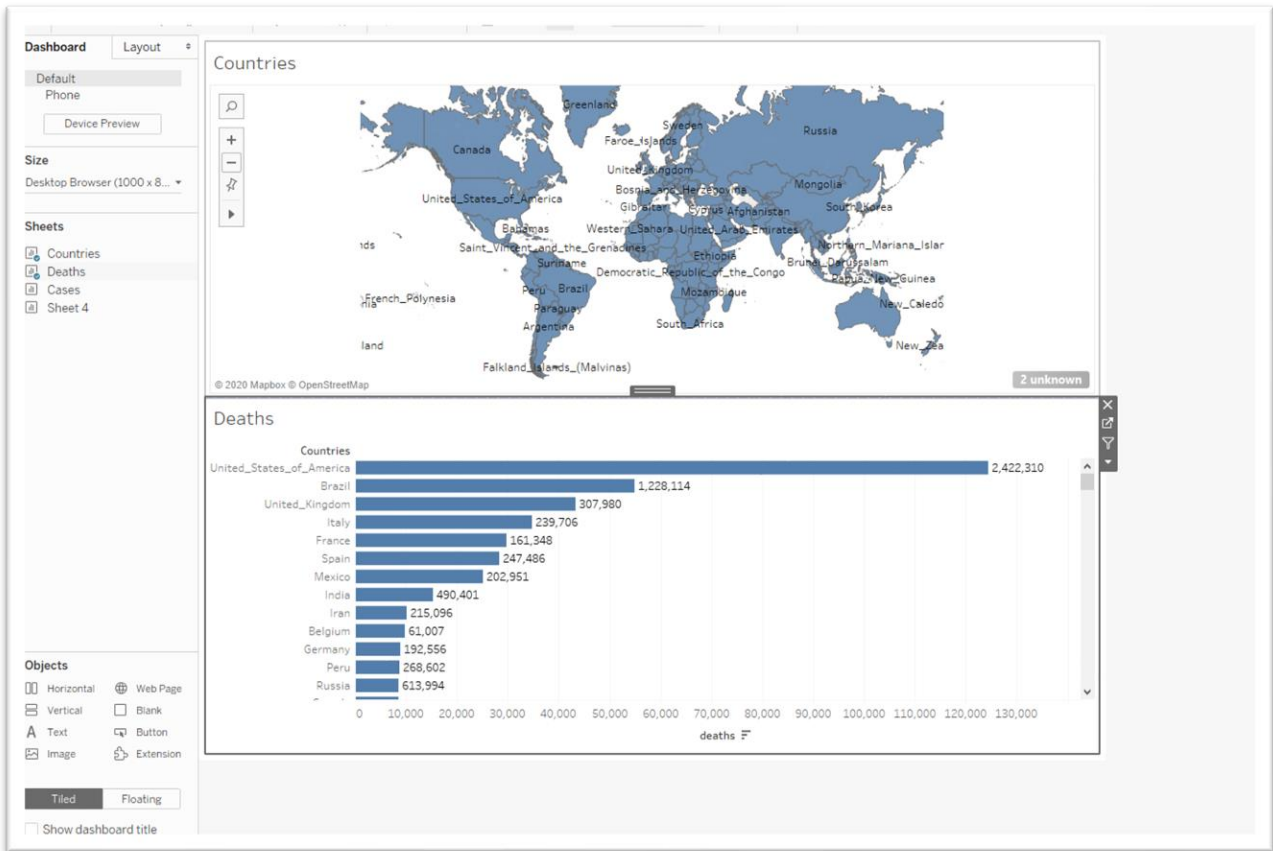


Our three worksheets are on the left.

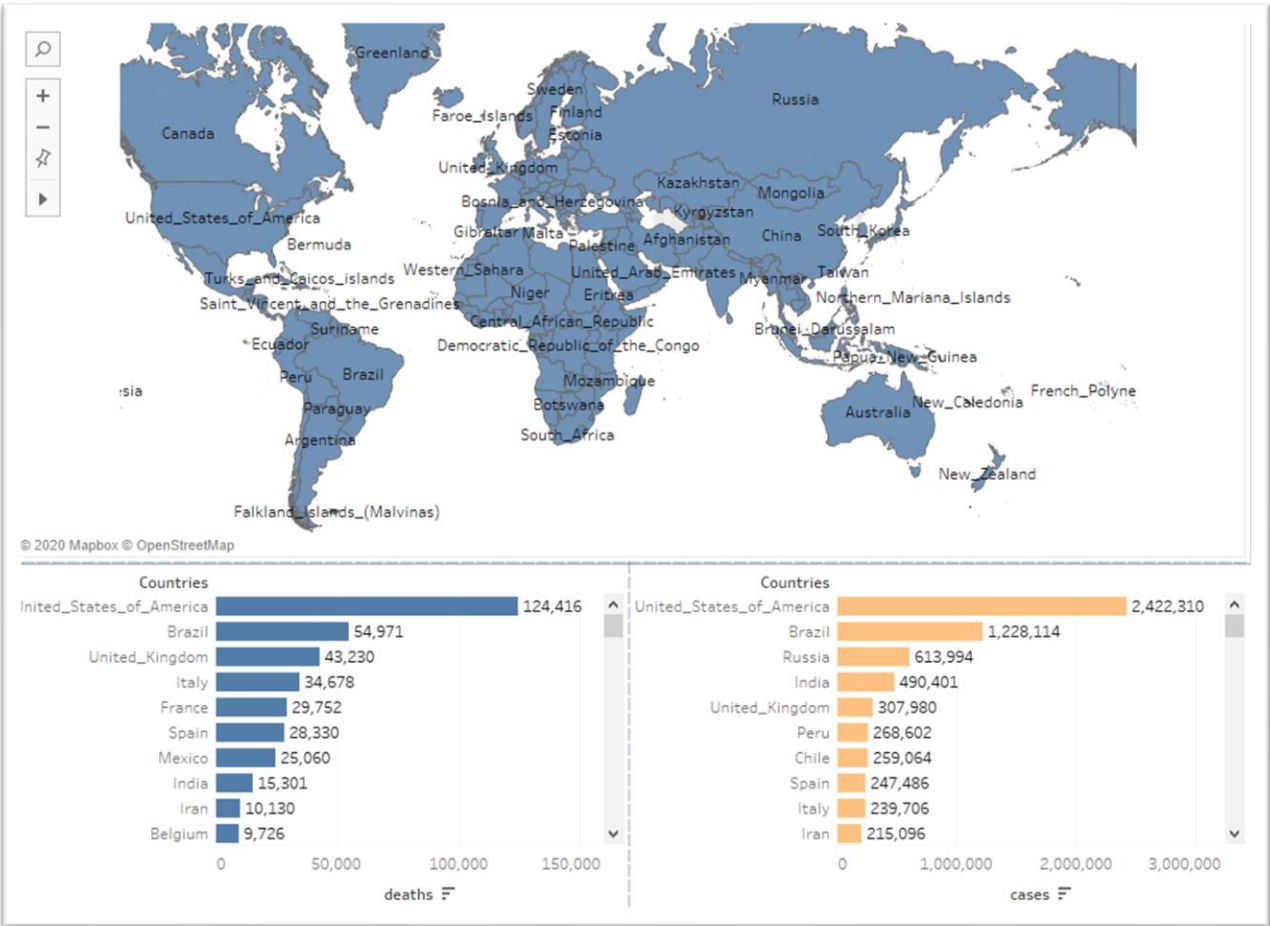
Drag “Countries into the drop area to the right.



Drag “Deaths” into the same pane until the grey area covers the lower half of the space and release your finger from the cursor.



Drag “Cases” and drop it into the area to the bottom right of the pane.



You can adjust the length of the map by clicking on the map until the grey boundary appears and dragging the edge downwards.

To give the dashboard a title, check the box to the left of the “Show dashboard title” prompt to the bottom left of your screen.

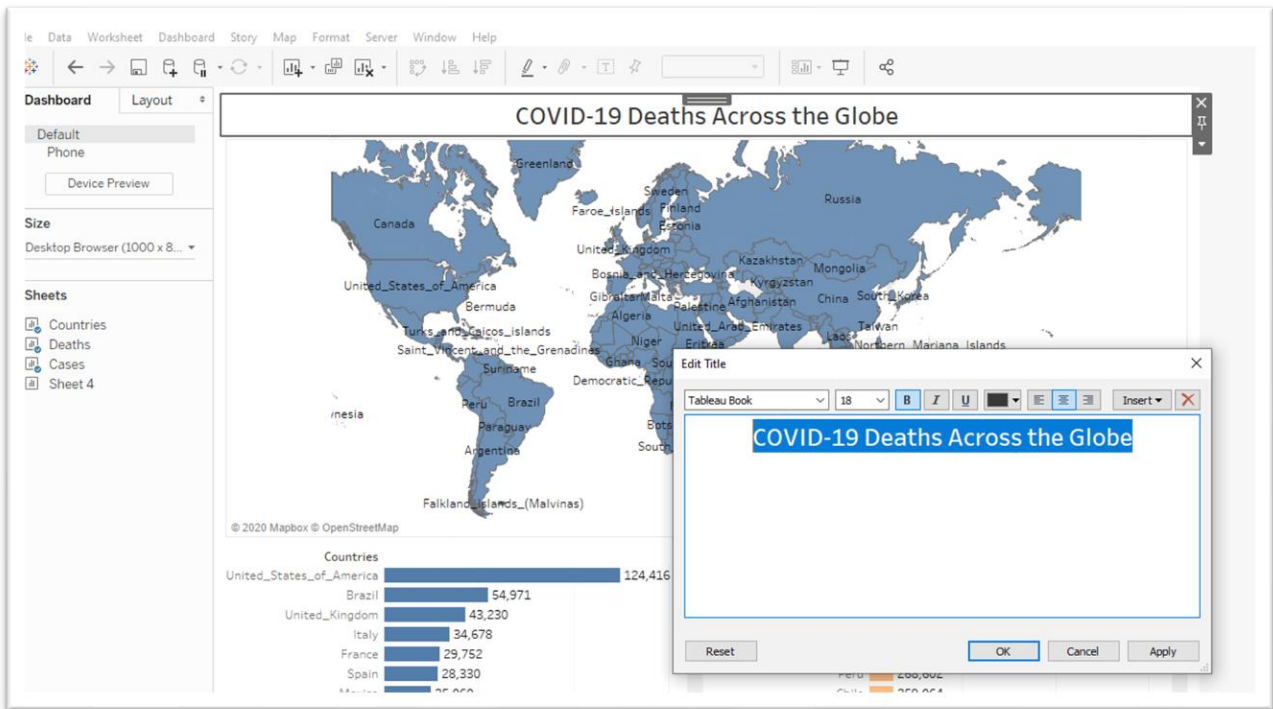
The screenshot shows the Tableau interface. On the left is the 'Objects' panel with options: Horizontal, Vertical, Text, Image, Web Page, Blank, Button, Extension. Below these are 'Tiled' and 'Floating' buttons, and a checkbox labeled 'Show dashboard title' which is checked and highlighted with a red box. On the right is a bar chart titled 'deaths' showing the number of deaths for five countries: India (490,401), Mexico (202,951), Spain (247,486), France (161,348), and Italy (155,700). The x-axis ranges from 0 to 100,000. At the bottom, the dashboard tabs include 'Data Source', 'Countries', 'Deaths', 'Cases', 'Dashboard 1', and 'Sheet 4'.

Country	Deaths
Italy	155,700
France	161,348
Spain	247,486
Mexico	202,951
India	490,401

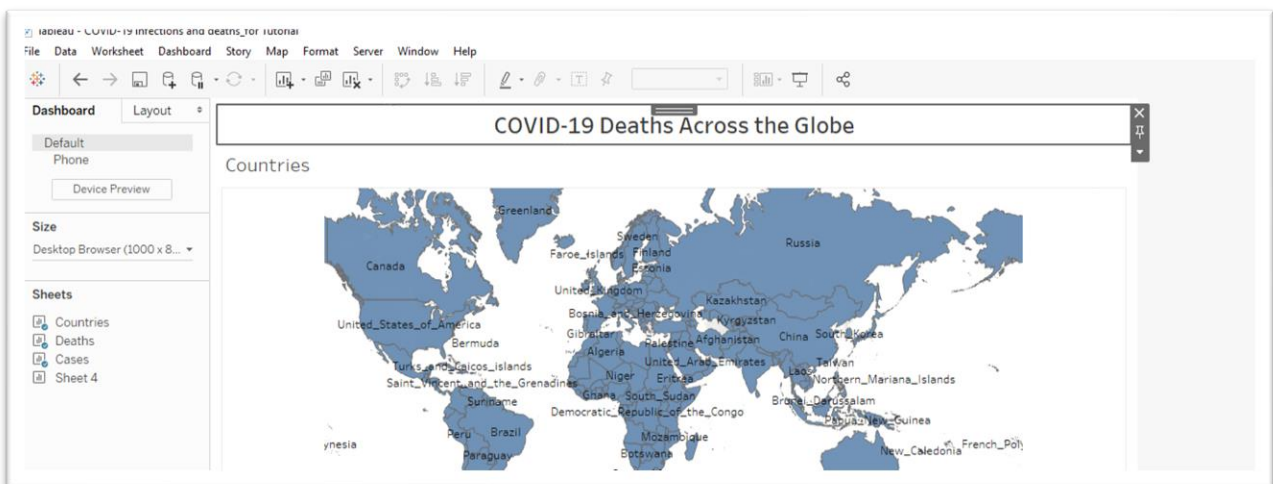
The screenshot shows the Tableau interface with the 'Dashboard 1' dialog box open. The dialog box has a title bar 'Dashboard 1' and a subtitle 'Countries'. It features a world map with various countries labeled, including Canada, United States of America, Mexico, Brazil, Peru, Suriname, Saint Vincent and the Grenadines, Turks and Caicos Islands, Bermuda, United Kingdom, Gibraltar, Algeria, Niger, Eritrea, Ghana, South Sudan, Democratic Republic of the Congo, Faroe Islands, Sweden, Estonia, Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan, Afghanistan, United Arab Emirates, China, South Korea, Taiwan, Laos, Northern Mariana Islands, Brunei Darussalam, and Papua New Guinea. The dialog box also includes a 'Layout' dropdown menu with 'Default' and 'Phone' options, a 'Device Preview' button, a 'Size' dropdown menu set to 'Desktop Browser (1000 x 800)', and a 'Sheets' list containing 'Countries', 'Deaths', 'Cases', and 'Sheet 4'.

Double click on “Dashboard 1” to produce a dialog box.

We can call the dashboard something like “COVID-19 Deaths Across the Globe.”



You can also select a different font type, point size, colour, etc. from the menu across the top, and choose alignment. Once you're happy with the result, select the OK tab.



Now a bit of clean-up.

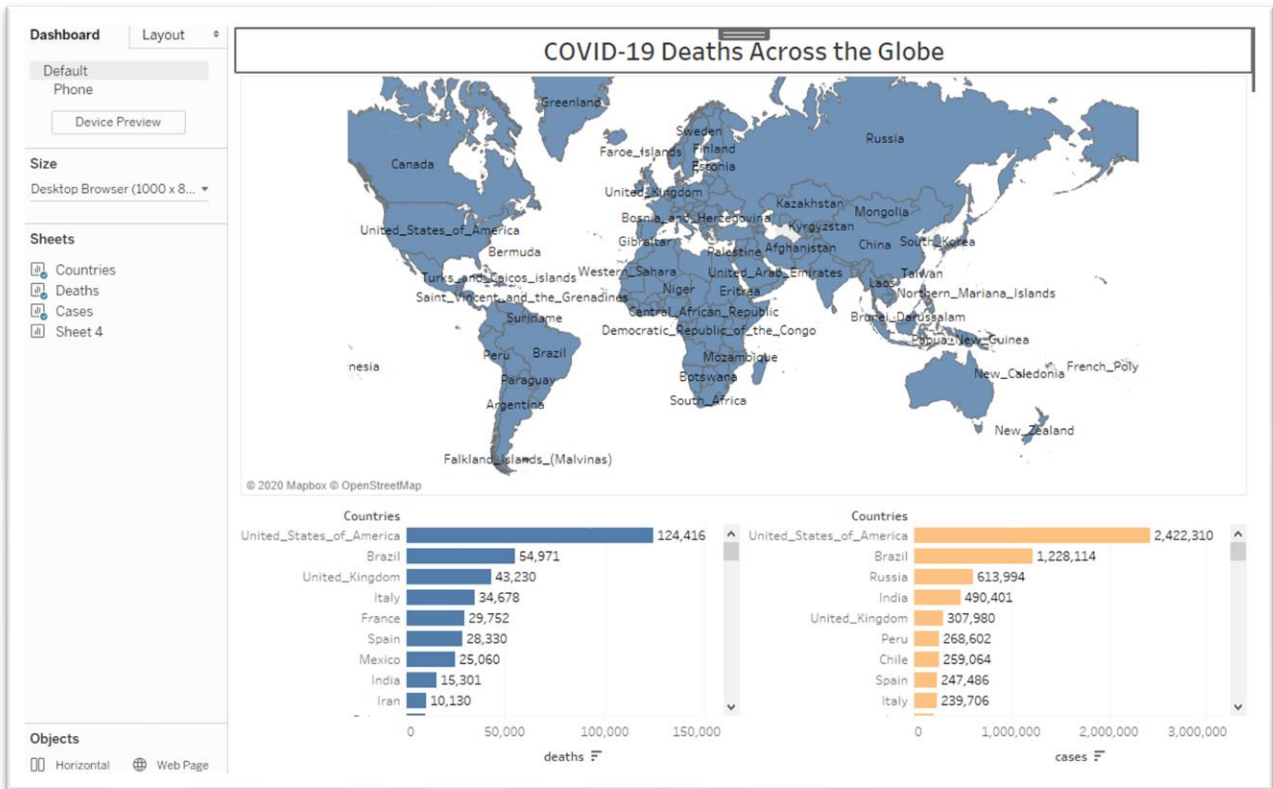
We will hide the labels for map and two tables.

First the “Countries” label above the map. Right click over the name to obtain a short-cut menu.



Hide the title.

Repeat the steps for the bar graphs.



We're getting there.

The “2 unknown” tab at the bottom right of the map means there are two locations Tableau is unable to map. Click on the tab.

Special Values for [Countries]

There are 2 values that have unknown geographic locations.
What do you want to do?

Edit Locations...
Correct the unknown locations.

Filter data
Exclude the special values from the view and calculations.

Show data at default position
Show the special values at a default position on the axis. For example, Null values are shown at 0.

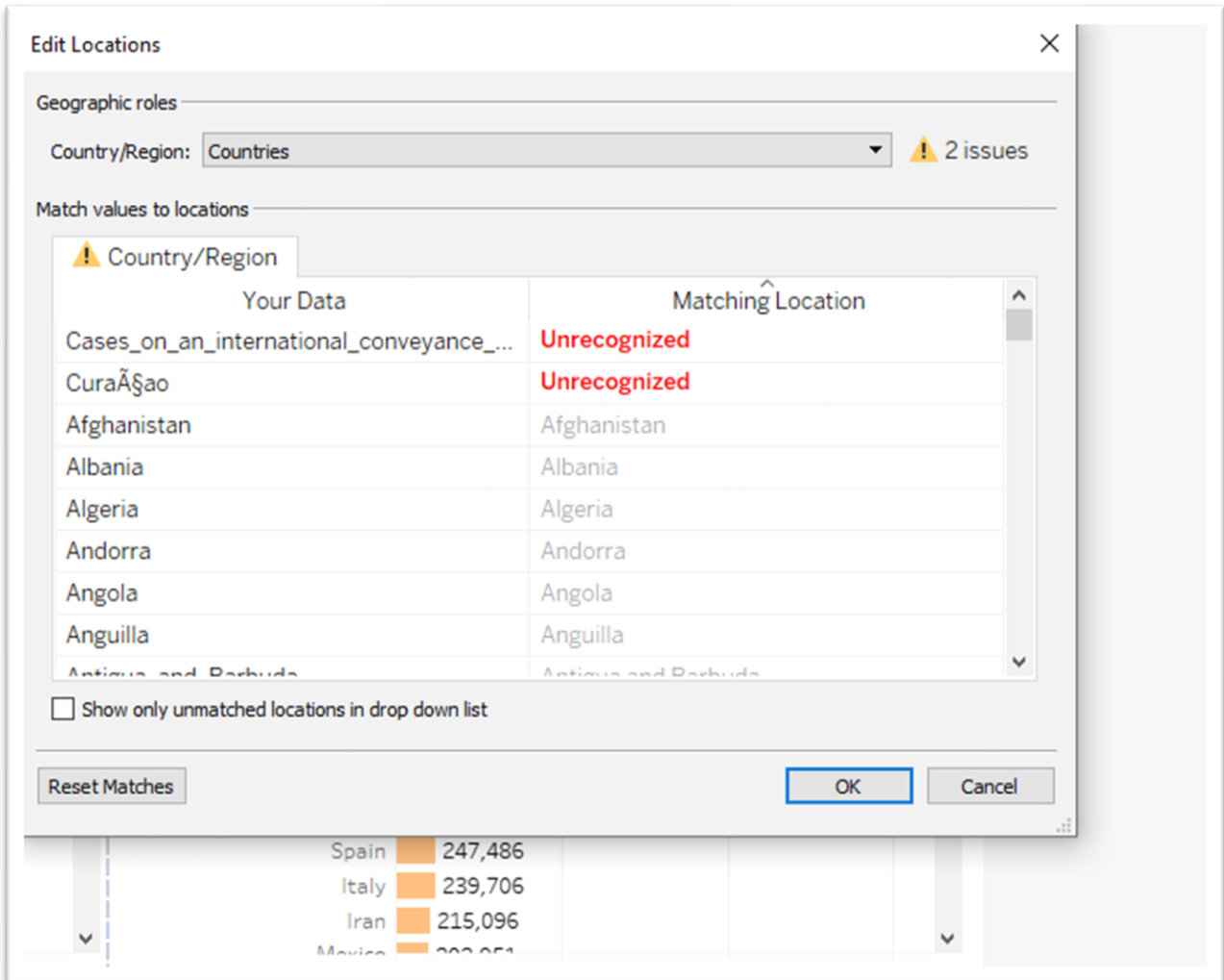
United_Kingdom 307,980

India 490,401

Peru 268,602

Chile 259,064

And then “Edit Locations.”

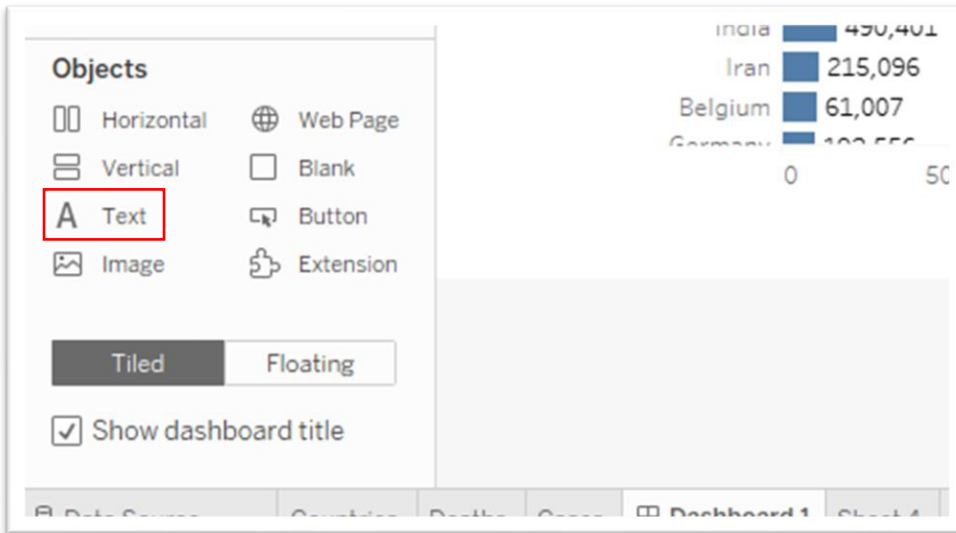


The locations it doesn't recognize are unimportant to us. If they were, we could type in the correct spelling or geographic coordinates of the country in question.

Close the edit box, right click on the tab and hide it.

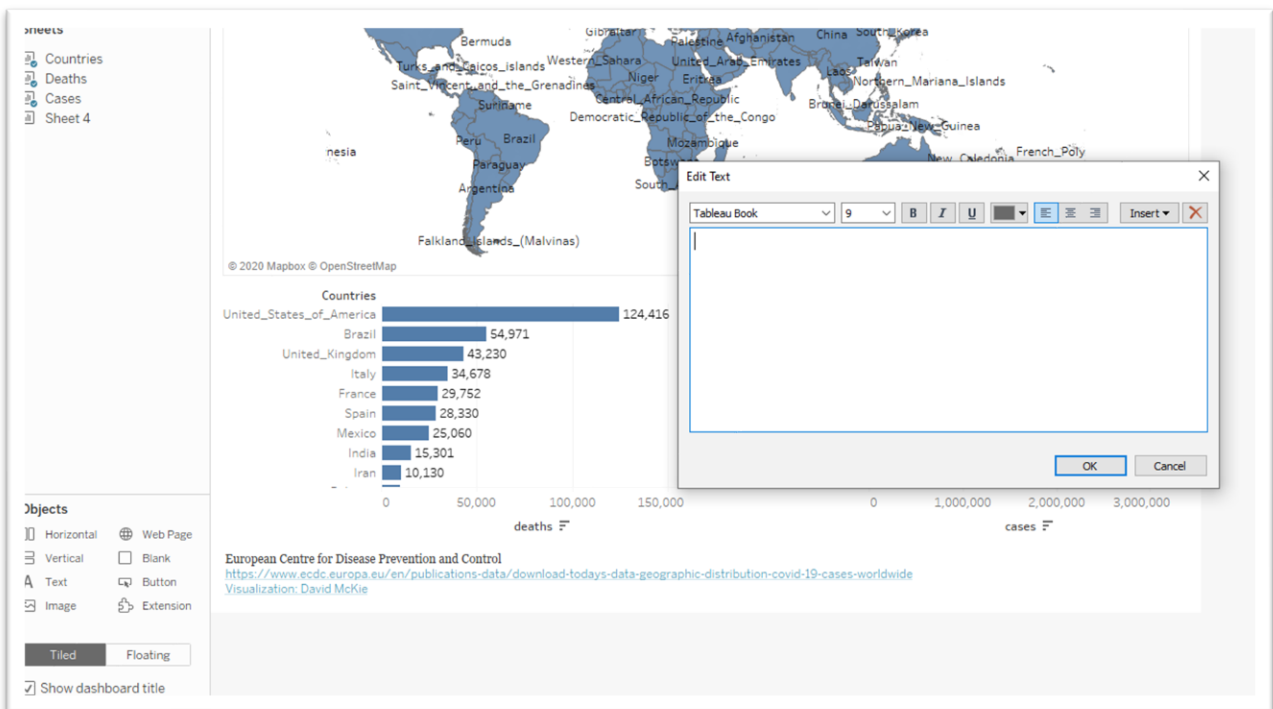
We need to cite the source of the graphic, along with the URL and the name of the brilliant individual who created the visualization.

Select “A Text” under “Objects” to the bottom left .

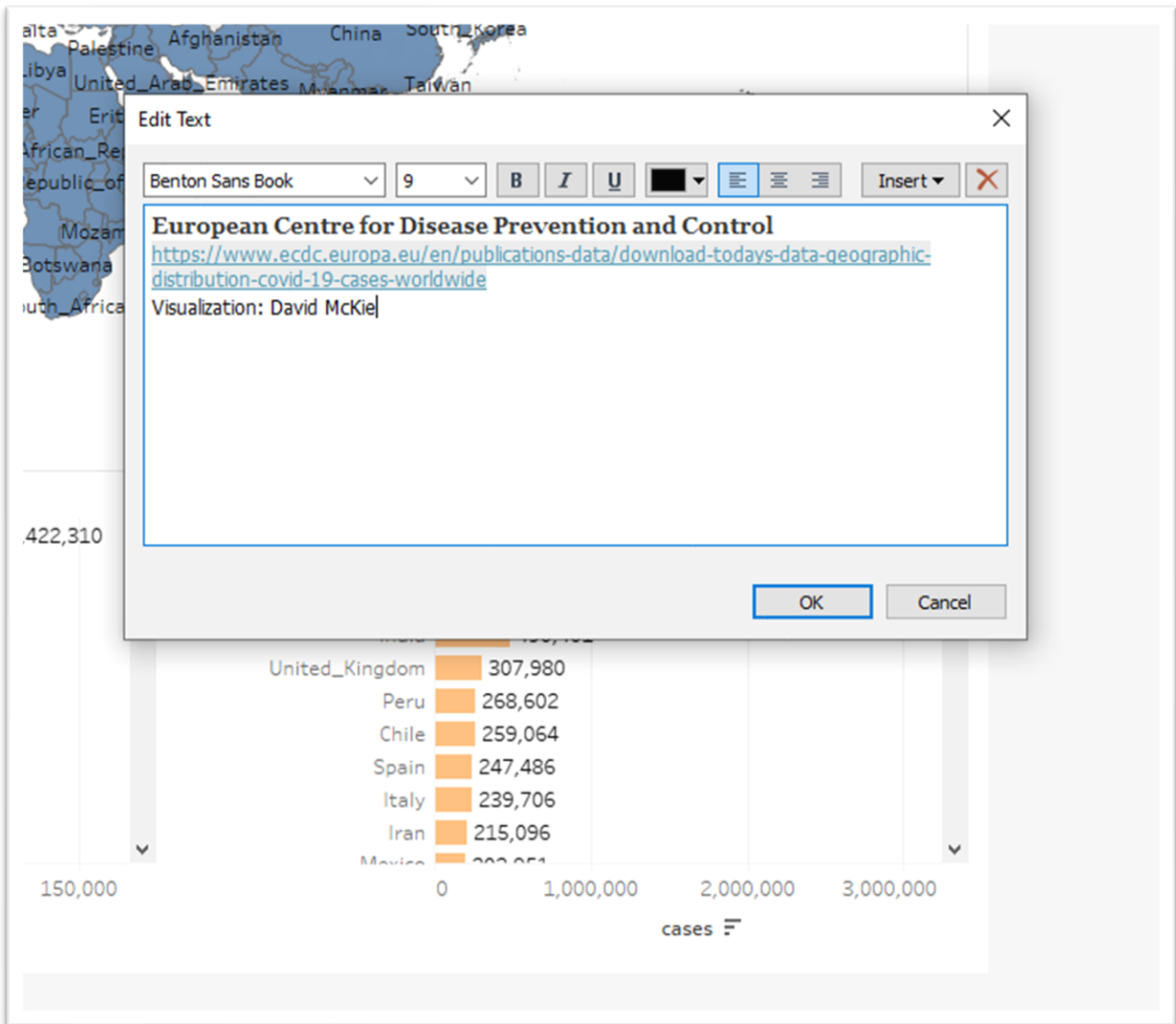


This is a bit tricky. So, you may have to attempt it a few times.

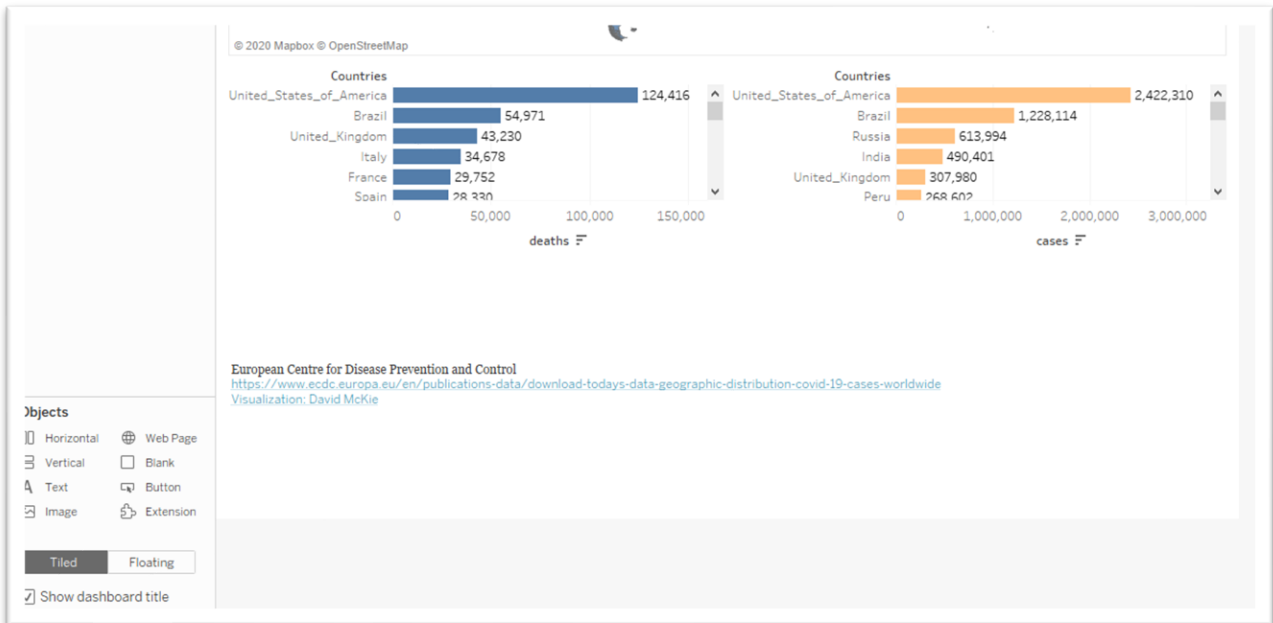
Drag the icon to the bottom edge of the visualization until the grey area covers the width of your screen area that contains the visualization, and release your finger from the mouse to produce the same edit dialog box we used to give the dashboard a title.



We'll need the source, URL and the name the individual who created the visualization.



If you're happy with the result, select OK. Be sure to save as you go.

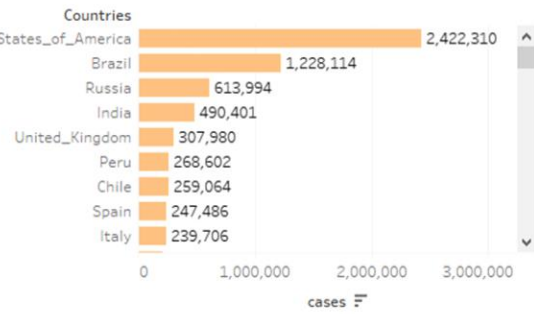
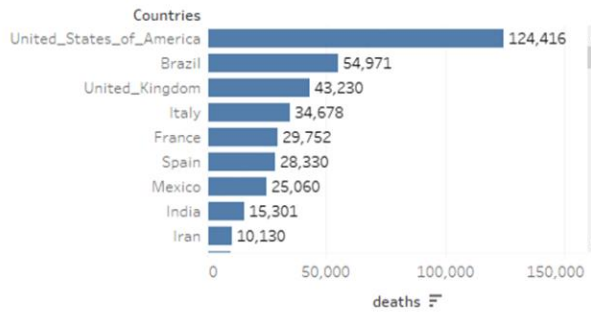


Re-adjust the height by placing your cursor over the black tab in the middle of the upper border and scrolling down until you reach the desired location.

COVID-19 Deaths Across the Globe



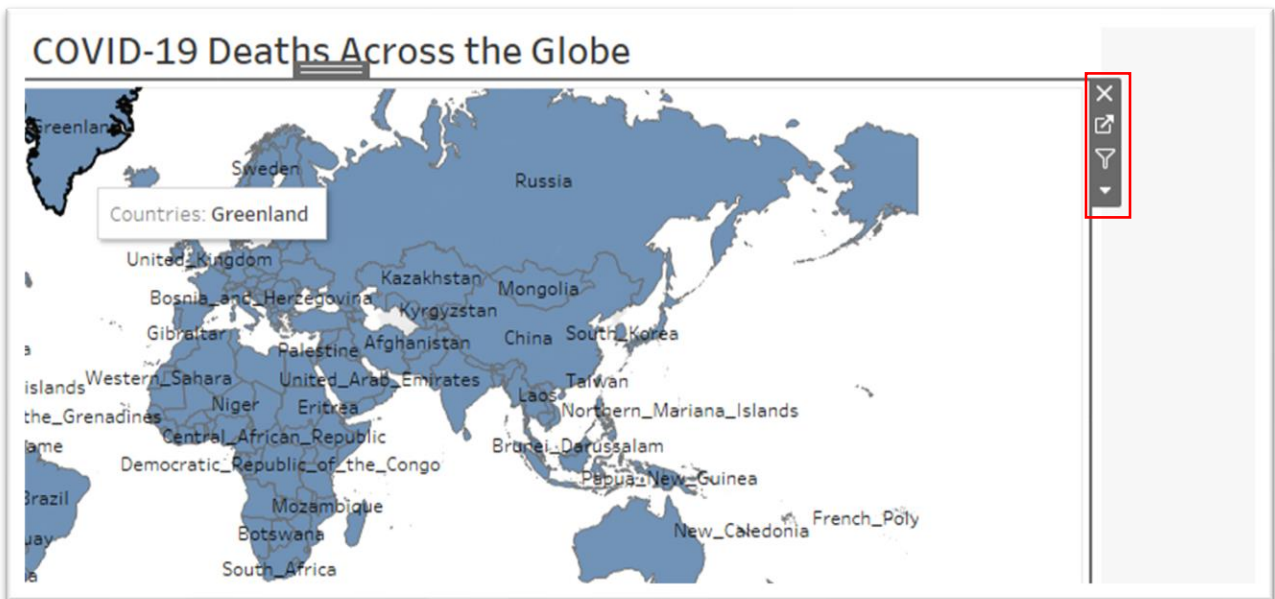
© 2020 Mapbox © OpenStreetMap



European Centre for Disease Prevention and Control
<https://www.ecdc.europa.eu/en/publications-data/download-todays-data-geographic-distribution-covid-19-cases-worldwide>
Visualization: David McKie

Now for the really cool part, making the dashboard interactive.

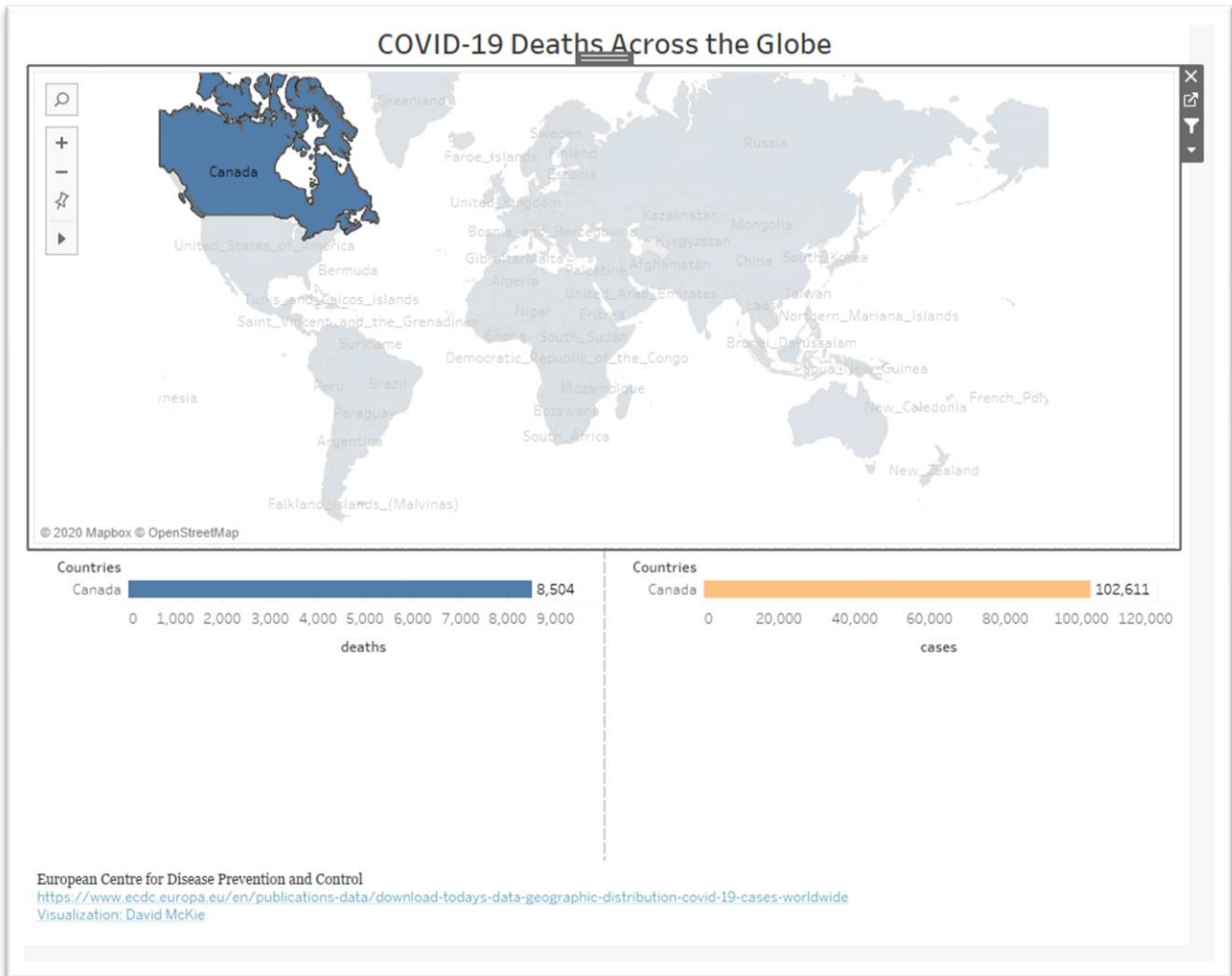
Click inside the map to make icons appear on the edge of the border to the top right.



Selecting the funnel icon, will allow the map to act as the filter for the two tables. In other words, clicking on a country produces the corresponding values in the death and case bar graphs below.



Click Canada and see what happens.



Return to all countries by clicking anywhere inside the map.

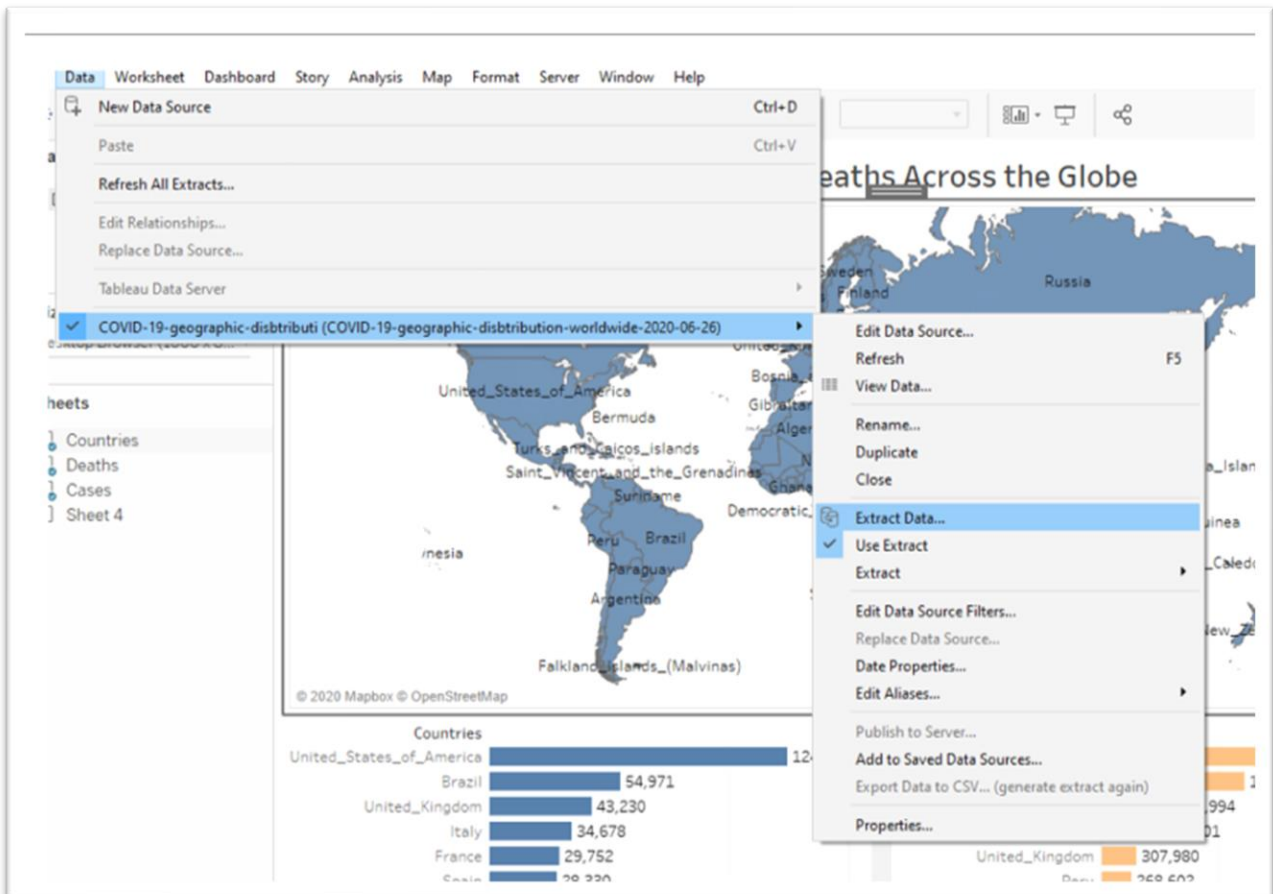
If you're happy with the result, you can publish the visualization, assuming that you have registered for Tableau Public. Make sure that the default visualization is all the countries displayed on the map. If we were to leave it as "Canada", then that's the visualization that people would initially see.

When you save to Tableau Public, it **MUST** be done from the dashboard.

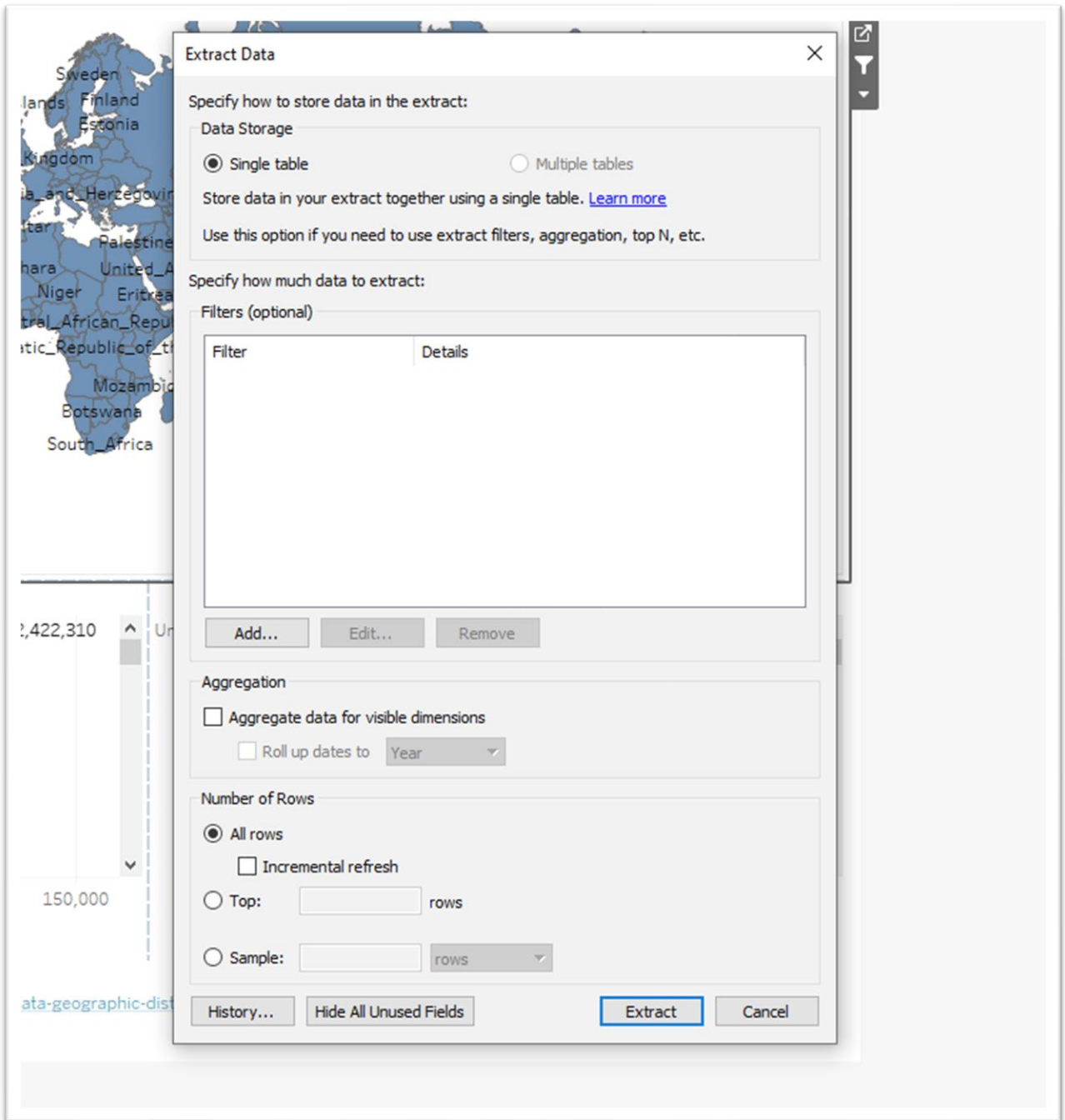
Saving Tableau Public produces an error message that we will only see once. It will say: "The Tableau server you are publishing to does not permit external database connections. Use the Data menu to create an

extract for the following data sources.” An extract is a set of the data that Tableau stores in its own format.

Go to the “Data” section on the horizontal menu at the top and select the “Extract Data” option from the drop-down menu.

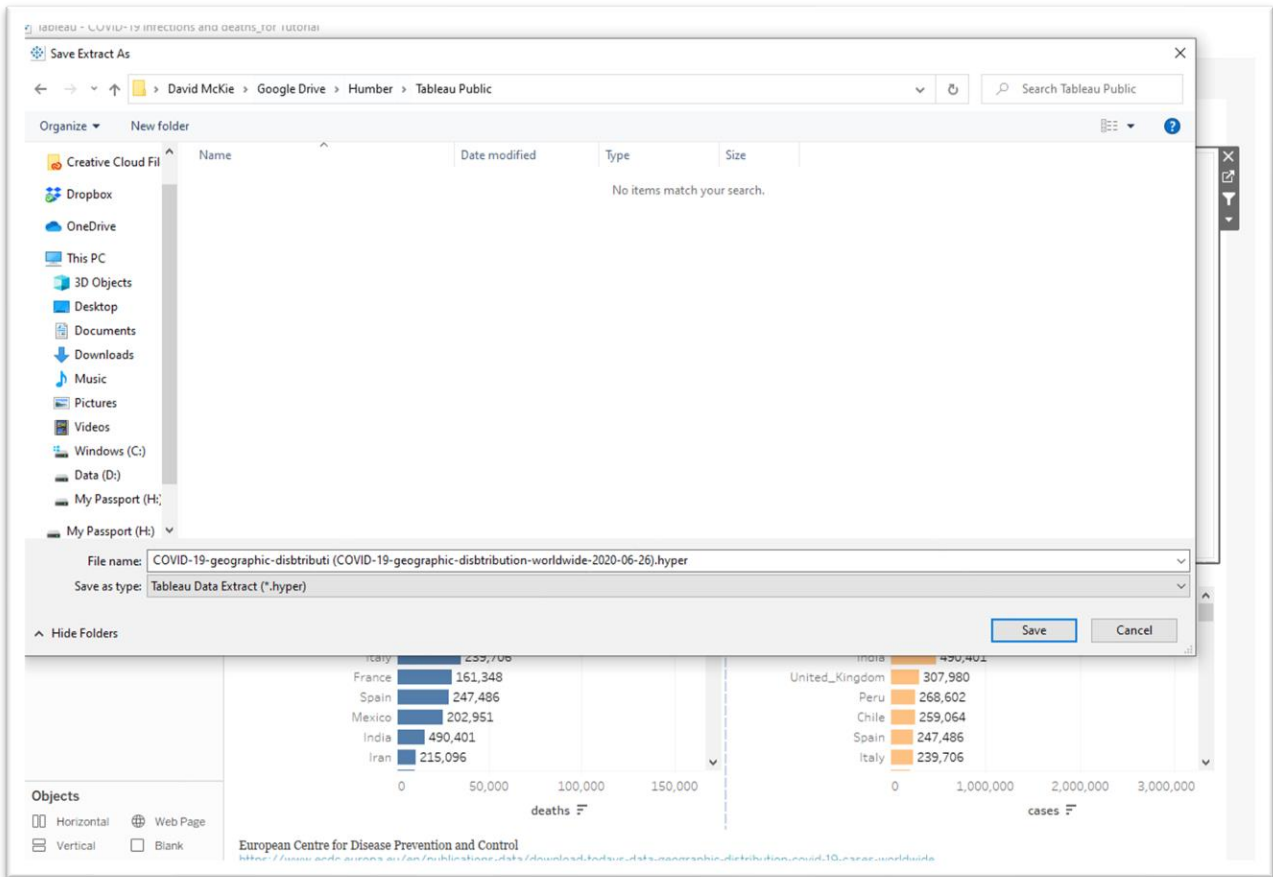


Your interface may look slightly different, but the key is the “Extract Data” option, which produces an “Extract Data” box.



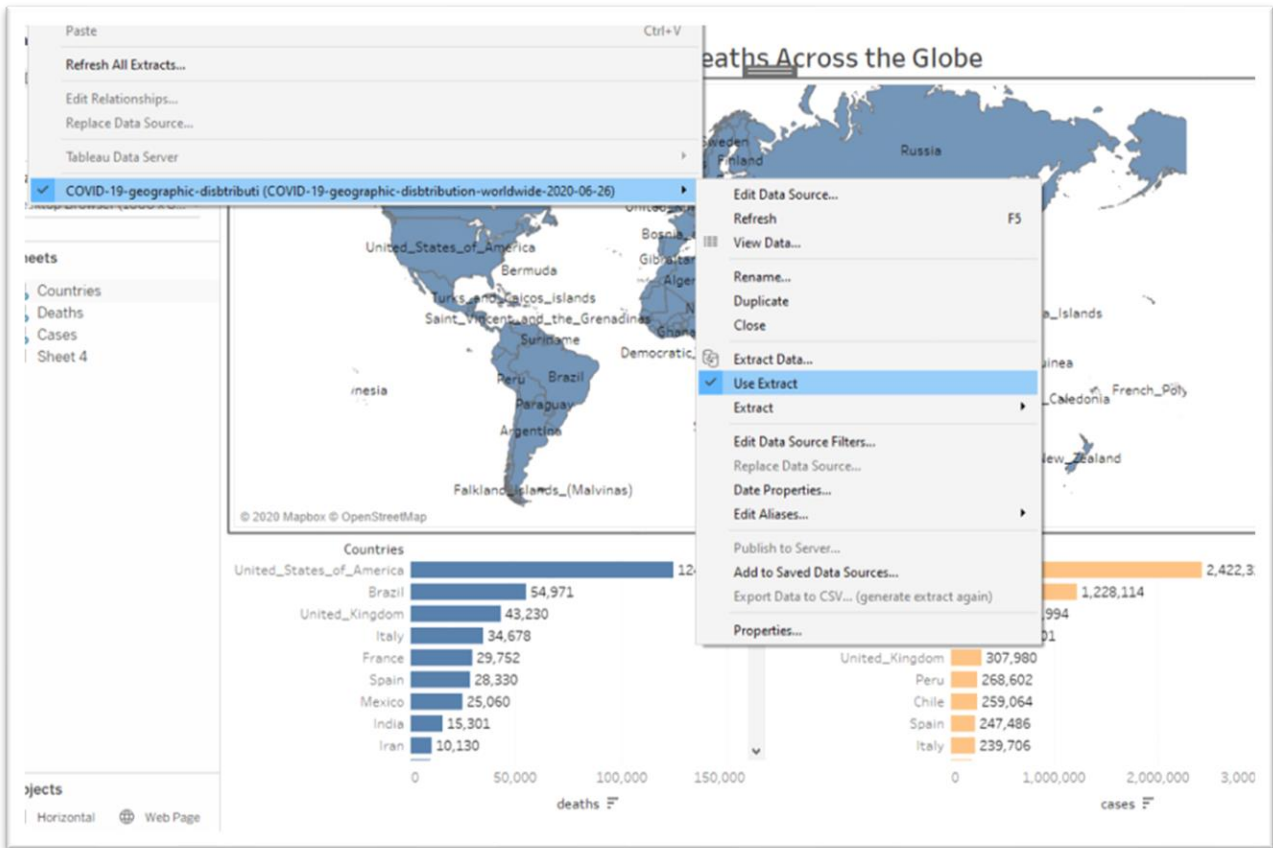
Select “All rows” and the “Extract” tab.

Save the extract to the same folder that contains your Tableau files.



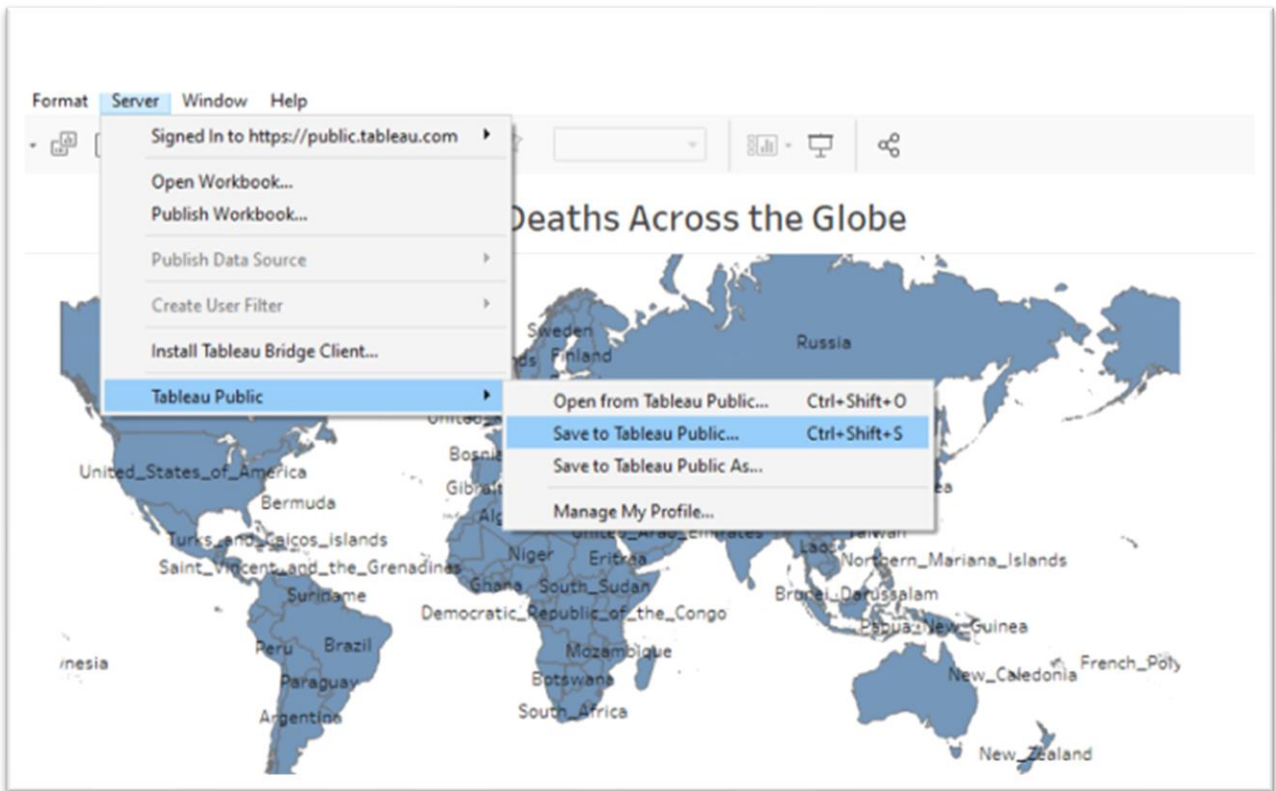
If you return to “Data” in the menu above, you’ll see that the “Use

Extract” option has now been selected.

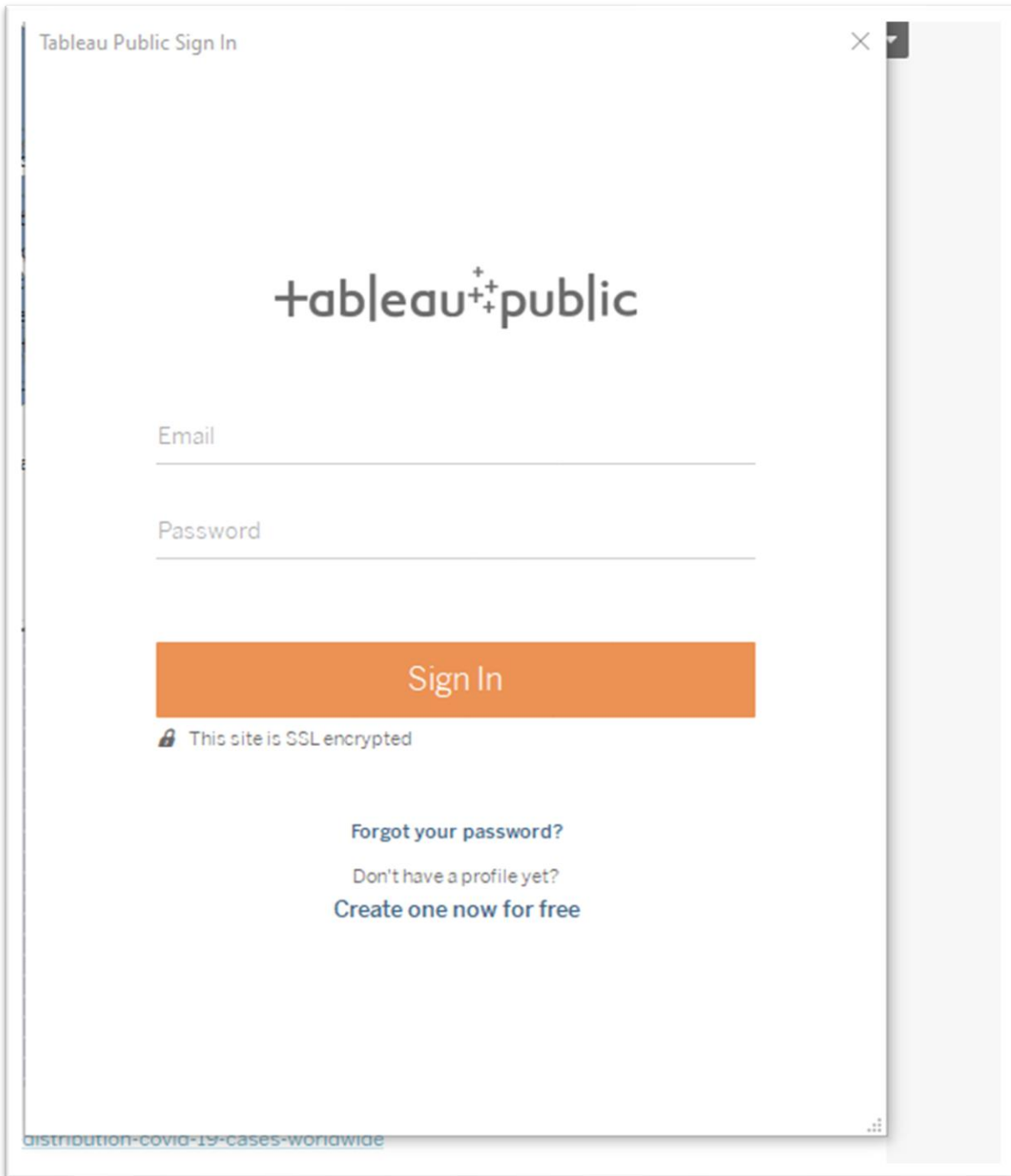


Now you can upload the dashboard to the server.

Go to “Server” and select “Save to Tableau Public...” from the shortcut menu.



This prompt will appear.

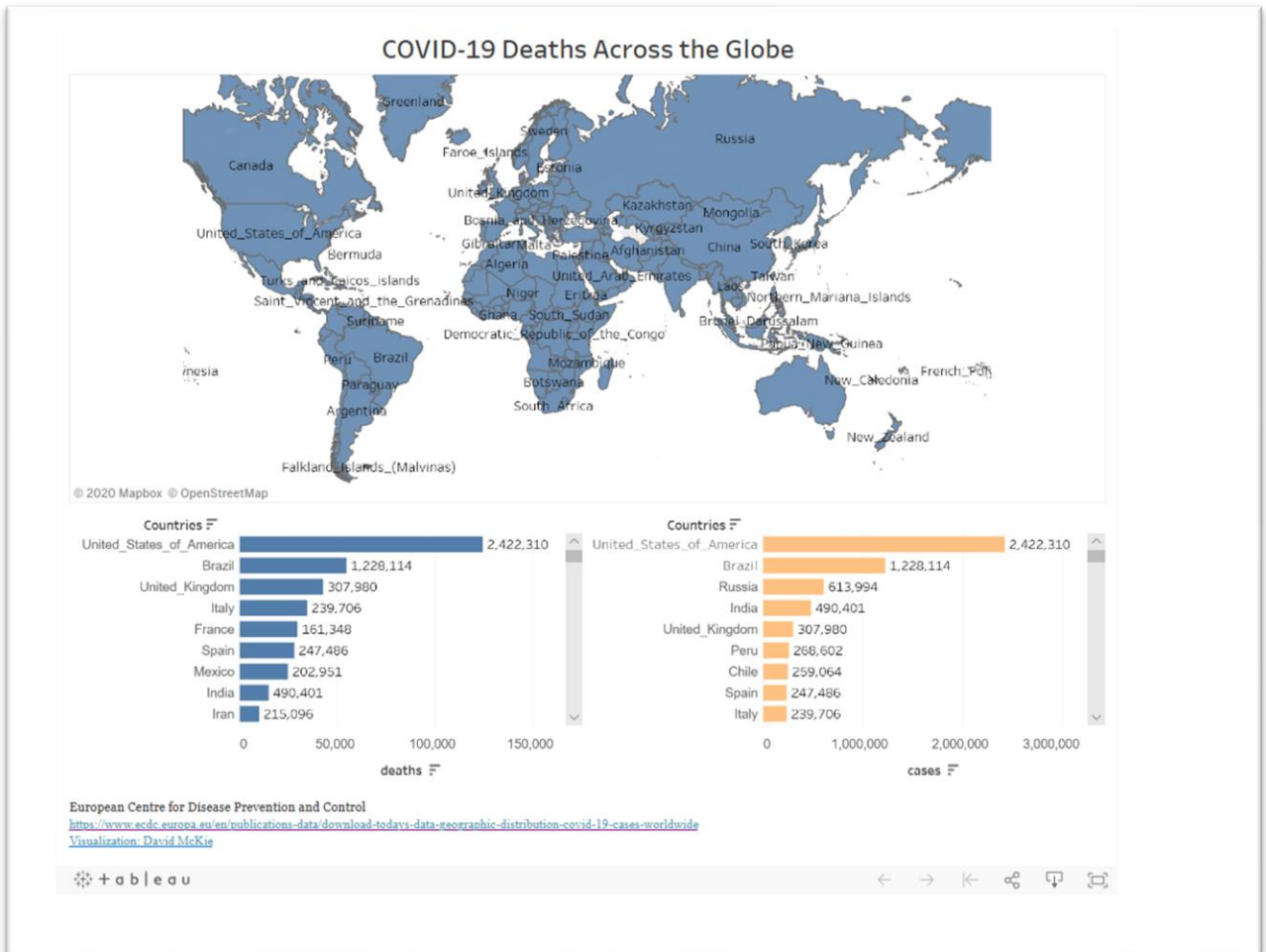


The image shows a 'Tableau Public Sign In' dialog box. At the top left, it says 'Tableau Public Sign In' and at the top right, there is a close button (X) and a small dark square icon. The main content area features the Tableau Public logo, which consists of the word 'tableau' followed by three small '+' signs and the word 'public'. Below the logo are two input fields: 'Email' and 'Password'. Underneath these fields is a large orange button with the text 'Sign In'. Below the button, there is a lock icon and the text 'This site is SSL encrypted'. At the bottom of the dialog, there are three links: 'Forgot your password?', 'Don't have a profile yet?', and 'Create one now for free'. In the bottom left corner, there is a small blue link that reads 'distribution-covid-19-cases-worldwide'. In the bottom right corner, there is a small icon of three dots.

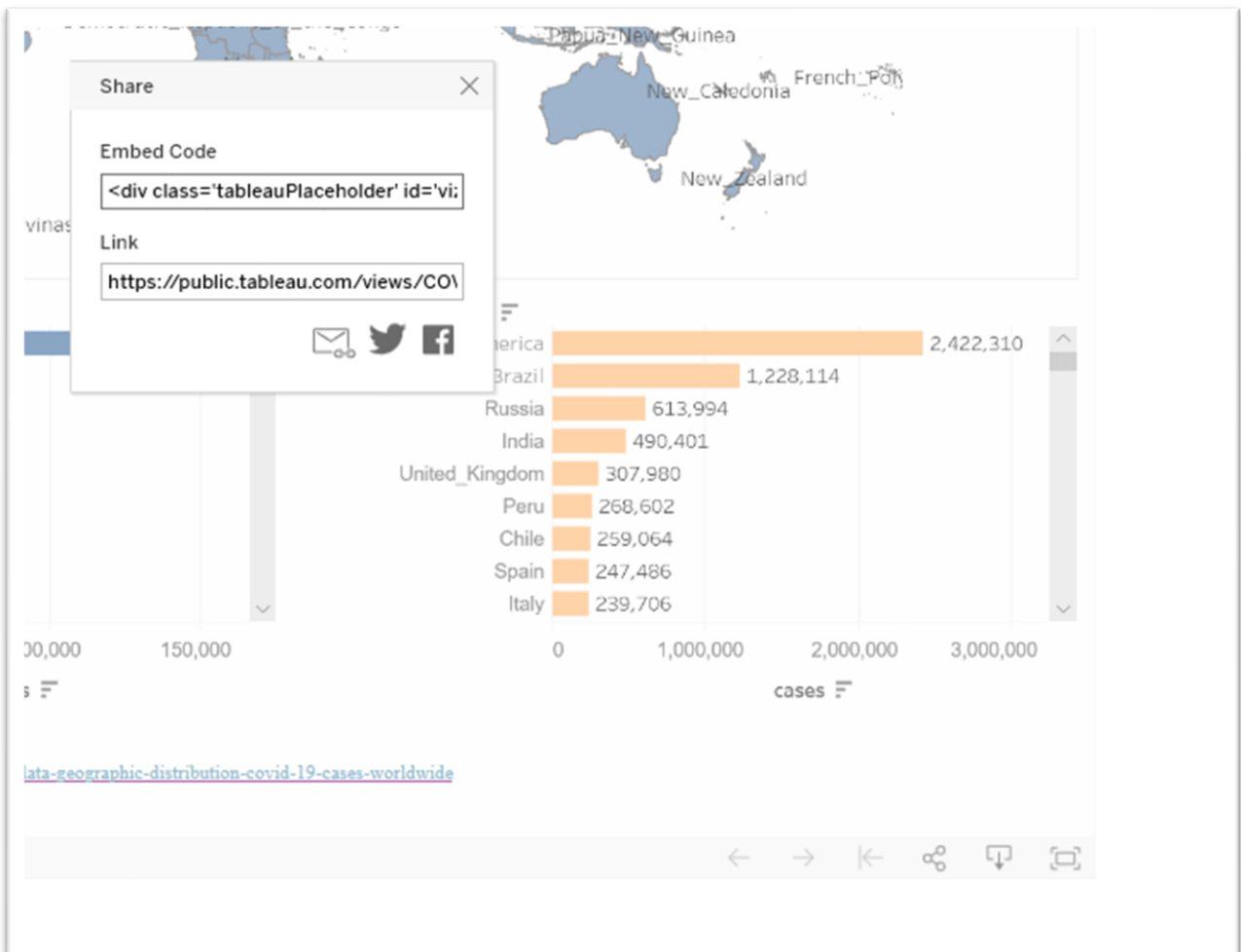
Enter your email address and the password used to set up your Tableau Public Account.

Your visualization will appear in your browser. Once you've signed, in you can always make adjustments to the dashboard, save the result and

paste the new embed code.



Select the share button to obtain the embed code.



Paste the embed code into the content management system that contains your story.

<http://www.davidmckie.com/29654-2/>

