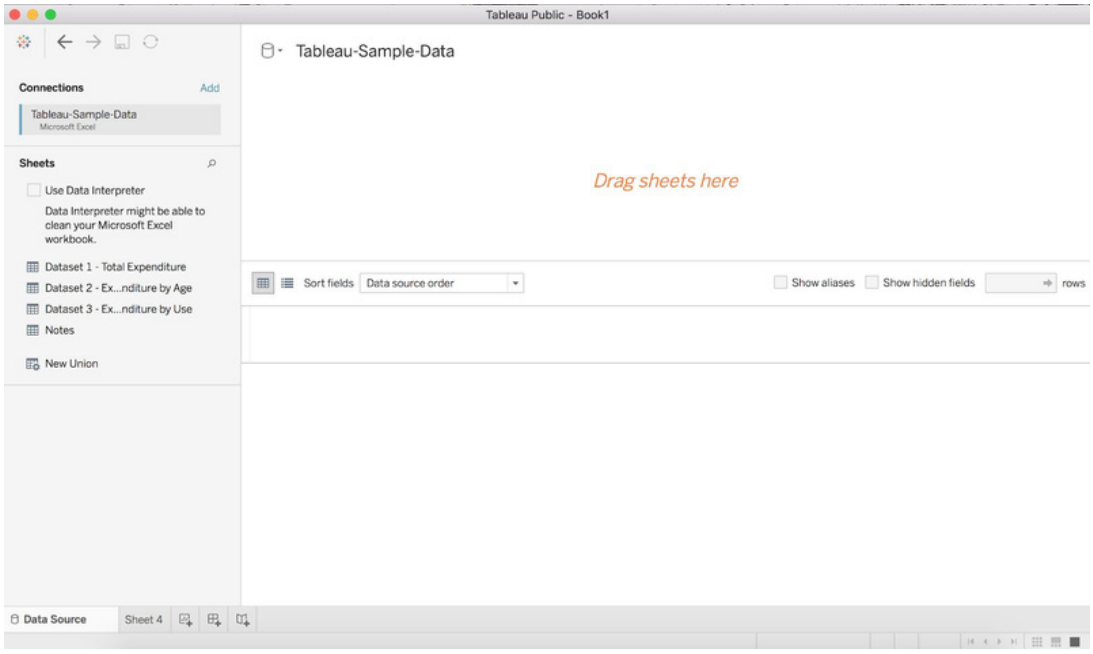
TABLEAU TUTORIAL

CREATING DATA VISUALIZATIONS

CREATING DATA VISUALIZATIONS

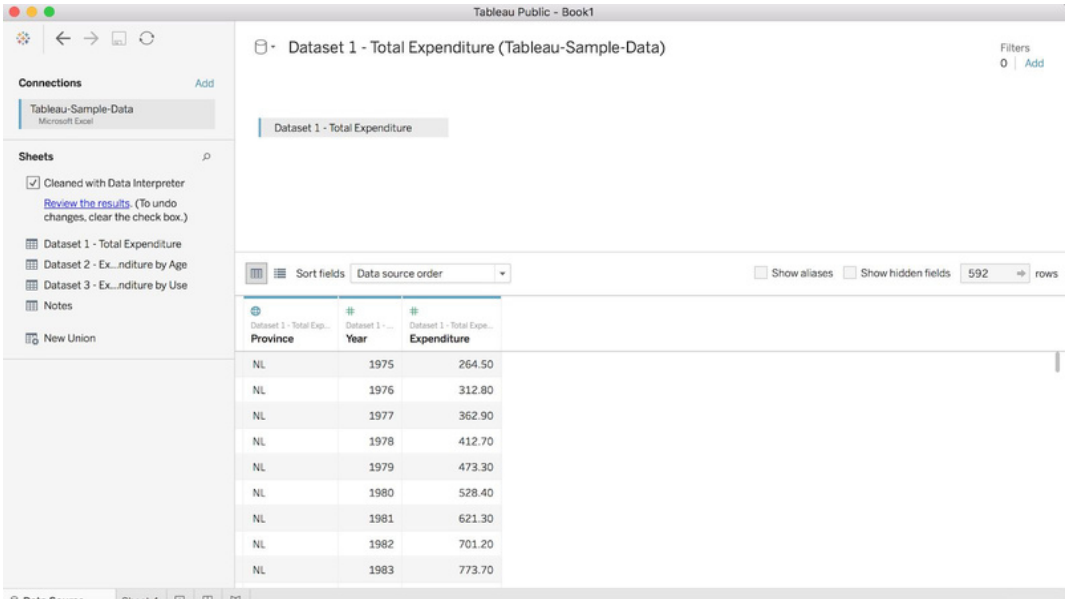
I.CREATING A MAP OF CANADIAN HEALTH EXPENDITURE BY PROVINCE IN 2016

Once you have uploaded your properly formatted geographic data your screen will look like this:

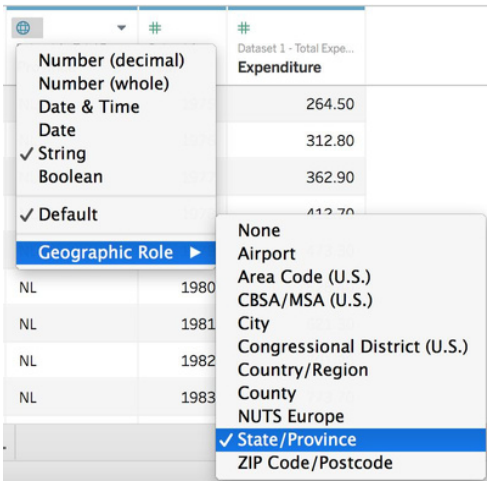


This is your Data Source page, where you can organize your data. On the left panel, you can see the sheets that were in the Excel file that was uploaded. If these sheets have common fields, you can join them by dragging them to the center together. For our purposes, we just need Dataset 1 - Total Expenditure, so drag that sheet to the centre. But before doing this, check off the box Use Data Interpreter so that Tableau can clean up the workbook and make it suitable for use.

After cleaning the data and dragging the sheet to the centre, your screen should look like this:



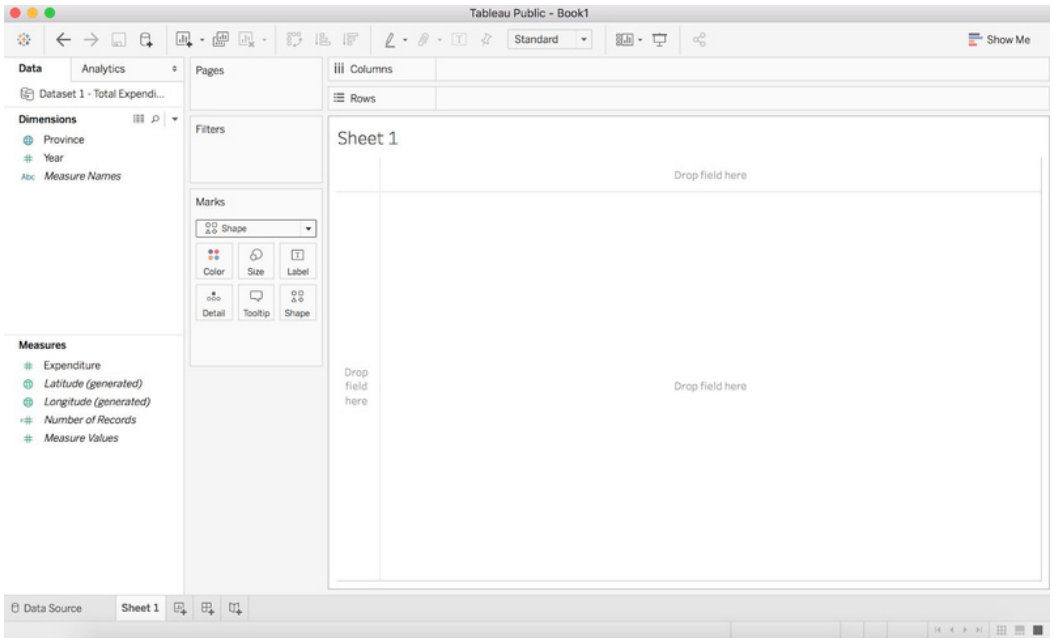
Your data is now connected, and Tableau has assigned a Data type to each column. Click the symbols in the header of each column to make sure it's the type you want. In our case, we want to make sure the Province column is assigned a geographic role. When we click this icon, we see that Tableau recognized the Province codes and did it for us!



We can also see that Expenditure and Year have been assigned as Numbers which is also what we want. It's important to know about this feature for future uses.

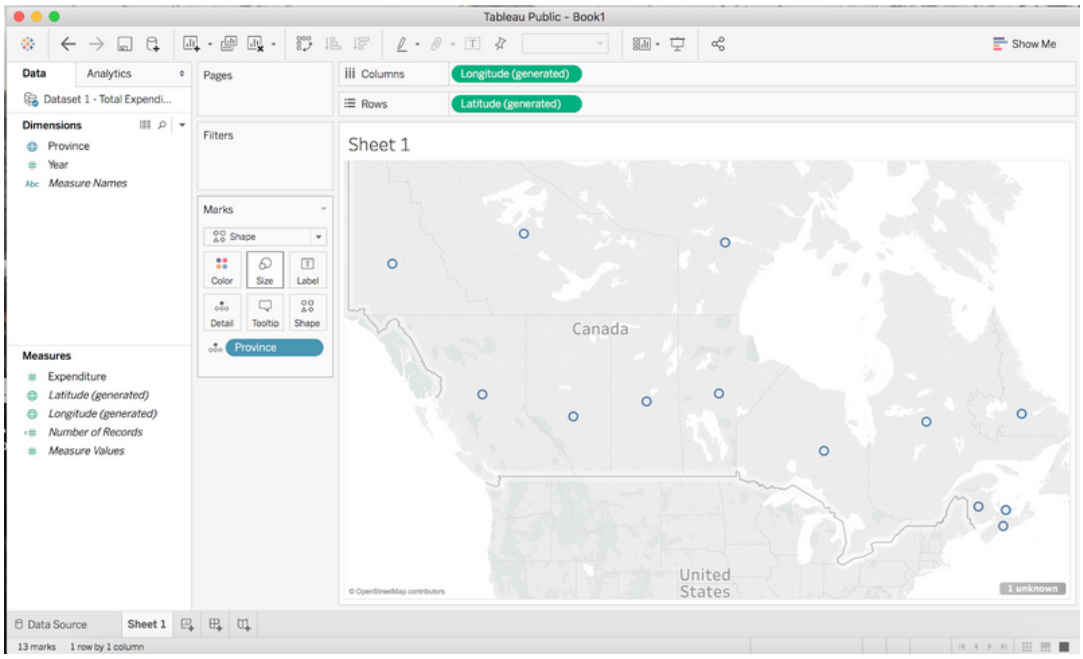
Now, on the bottom of your screen, you should see a tab labelled Sheet 1, click this.

Your screen should now look like this:



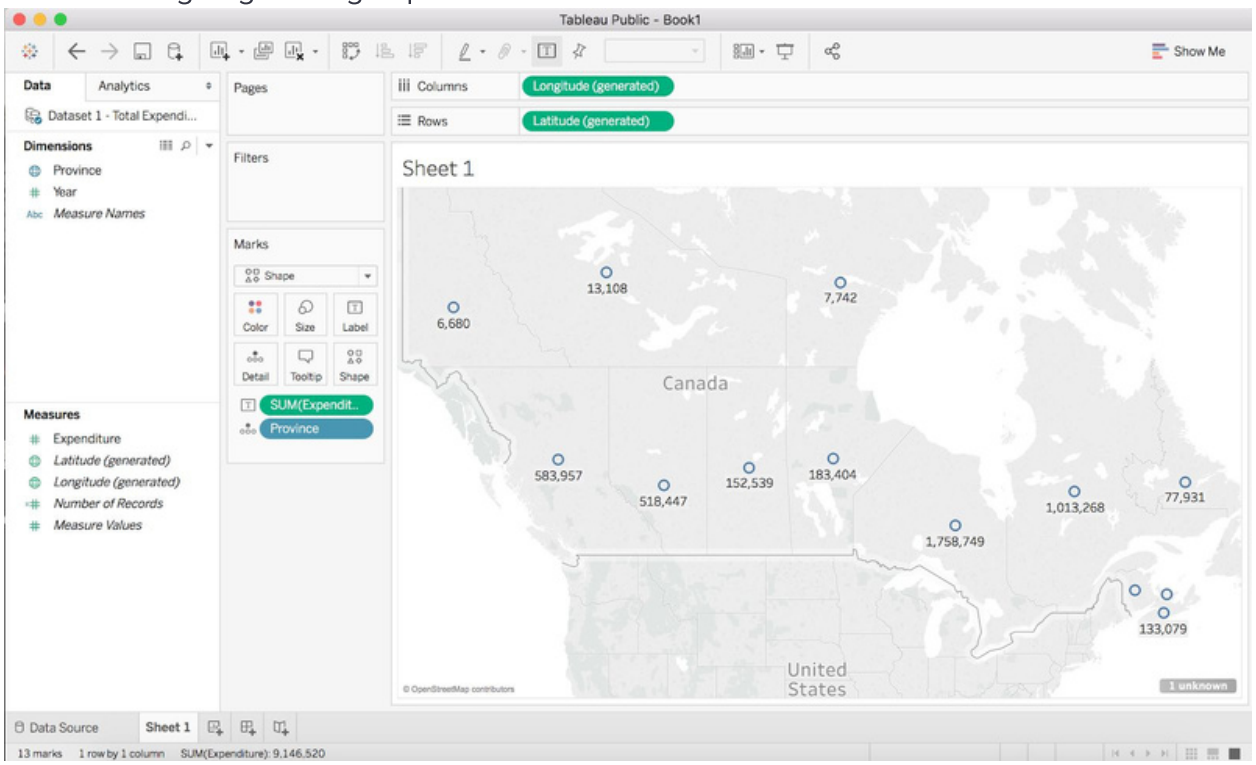
So now you're in your worksheet and this is where you will build your map. On the left side of your screen is the Data pane. The columns of your data are listed as fields and assigned as Measures or Dimensions. Dimensions are usually qualitative data and Measures are quantitative, you can drag and drop fields in to either of these categories to change their assignment if needed. You can see that Tableau automatically generated Latitude and Longitude Measures because we're using geographic data.

Now, to begin creating the map, drag and drop Province into the centre of your sheet. Your screen should now look like this:



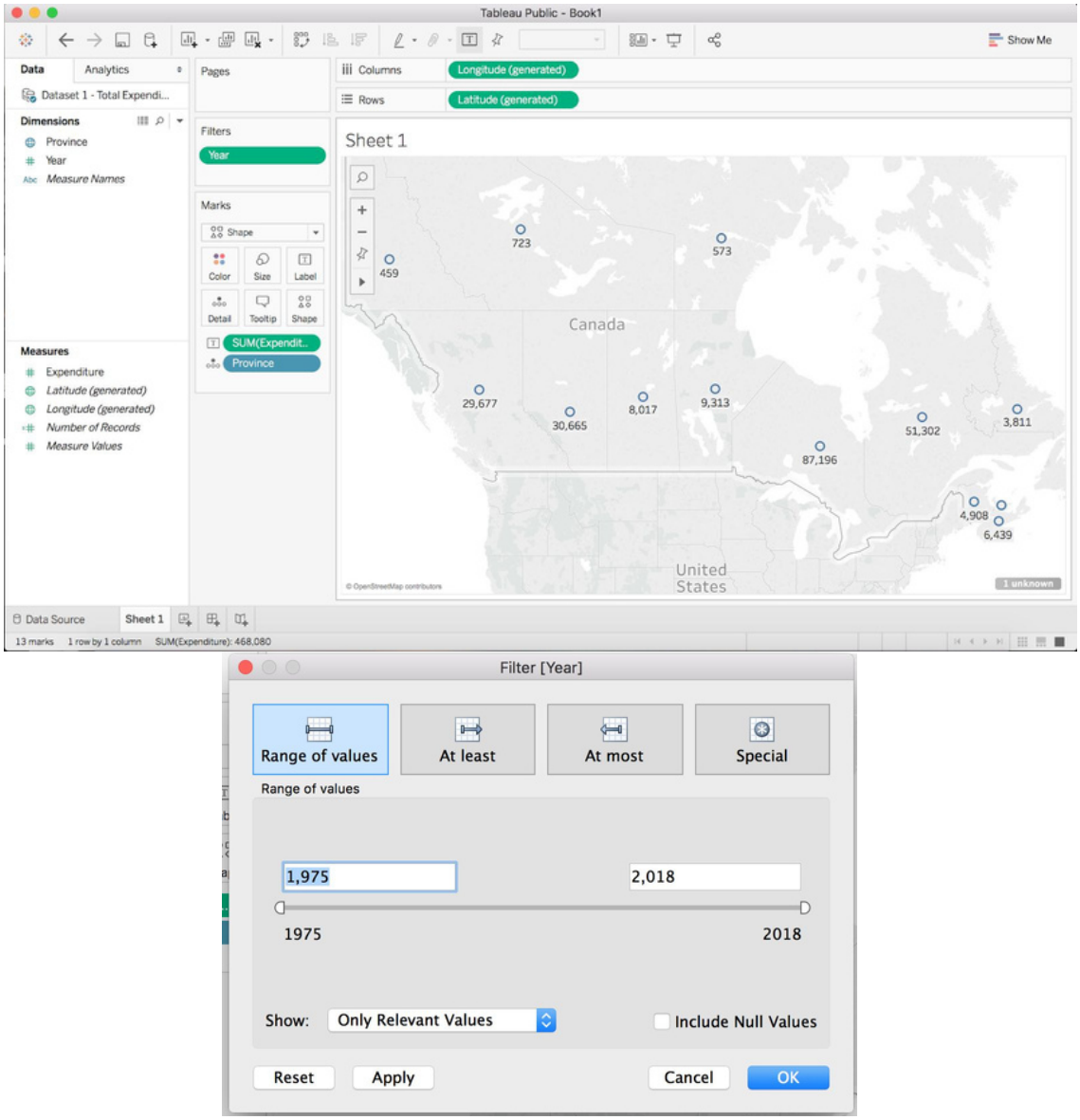
You will see that longitude and latitude have automatically been placed into the Columns and Rows shelves. You now have a basic map view that can be edited as you like by dragging and dropping other fields into the marks.

We are now going to drag Expenditure into Label:



Now, each province has the sum of their health expenditures since 1975 labelled on the map. But, we only want the expenditure for the year 2016, so we have to place a filter on the map. To do this, we will drag Year from Dimensions into the Filters box. This box should appear.

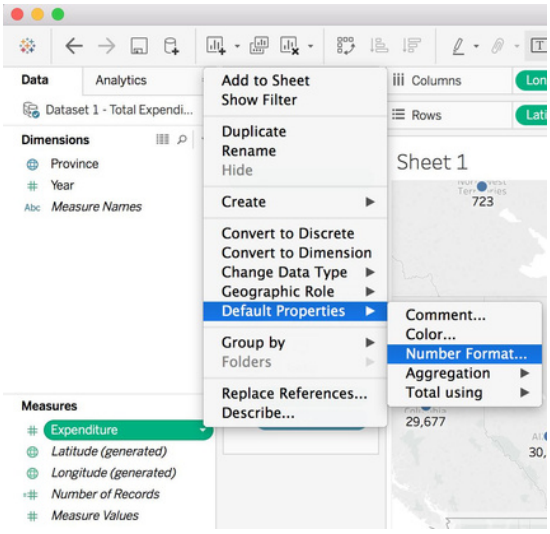
Change the Range of values from 1975-2018 to 2016-2016 to just get expenditure data from the year 2016.



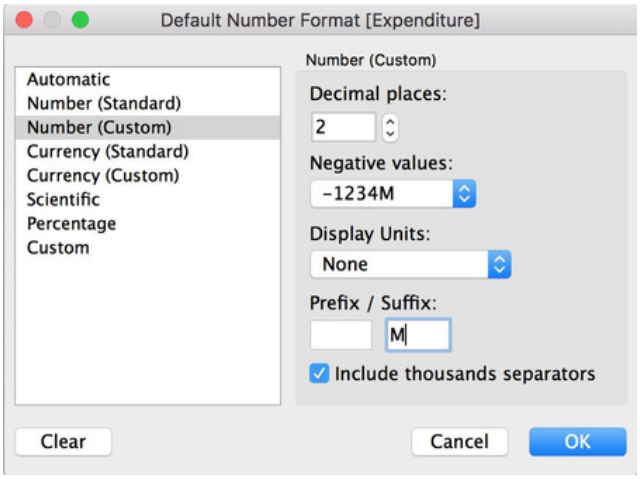
The expenditure labels should now change to look like the above image.

Now, we want to edit the label properties because we know expenditure is in millions of dollars. To do this, we click Expenditure in the Measures tab and the drop down menu should appear. Click on Default Properties and Number format.

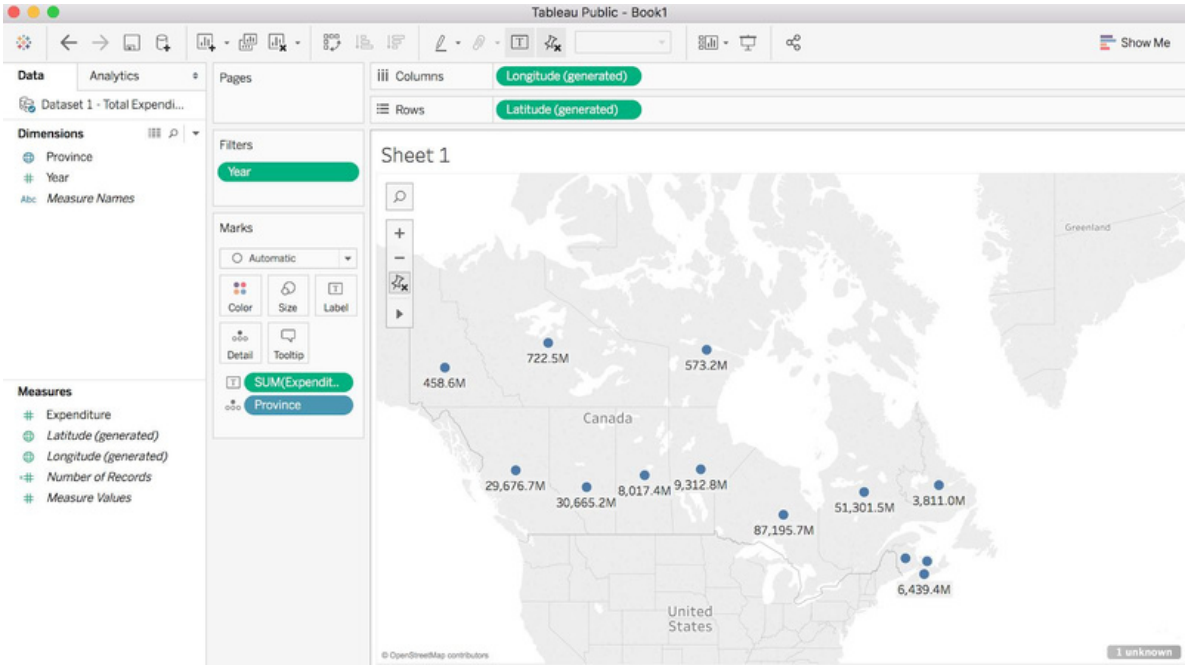
(1)



(2)



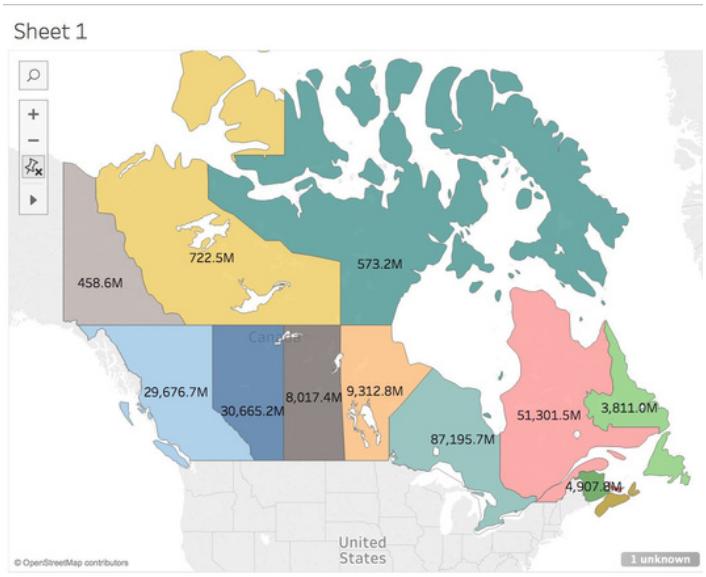
This allows us to change the properties of how Expenditures appear on our map. In the box that appears, (2), change the Suffix to “M”, so all the expenditure values will carry an M as in millions at the end. We won’t use the Display Units option because our units from our data are displayed in millions and it will not translate to the right amount with this set of data. In other cases, you can use this option. Also, set the Decimal places to 1. Your screen should now look like this:

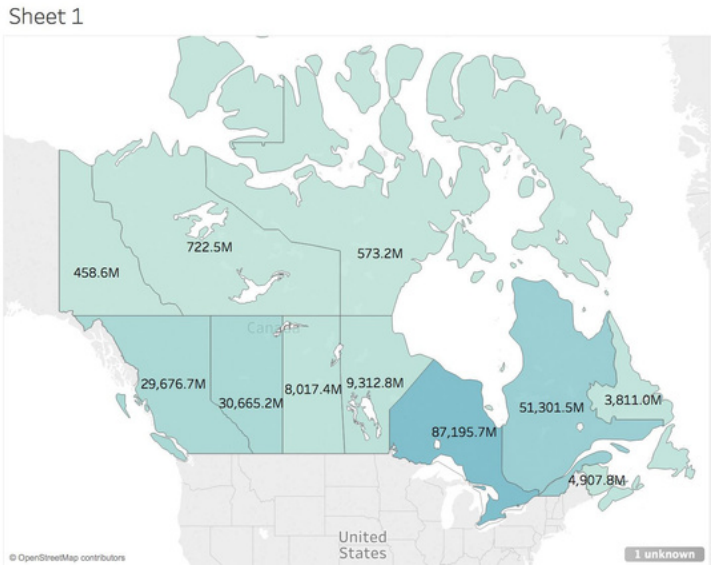


Next, we are going to colour our map based on the provinces. To do this, drag and drop Province from Dimensions to Colour in the Marks card. Make sure to change the marks tab to Map at this point from Automatic in the drop down menu. Each province is now

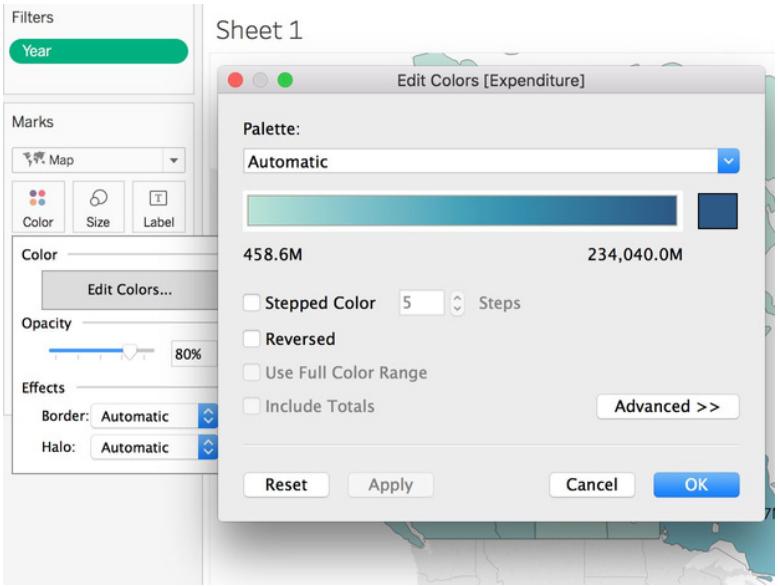
coloured by region (see Image 1 below). You could also colour the map based on Expenditure if you chose to drag Expenditure to colour (see Image 2 below).

(1) (2)



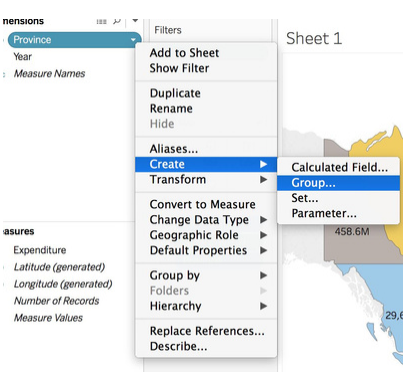


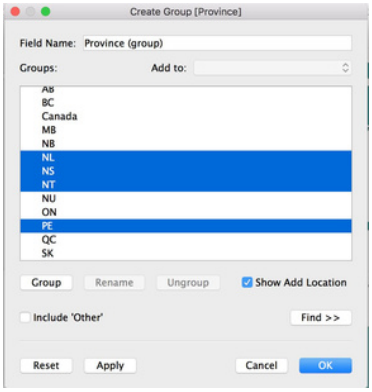
You can also click on Colours in the Marks card to edit and choose other colour schemes. Just click on Edit Colours after clicking on Colours, then click the drop-down menu underneath Palette, and choose the one you like.

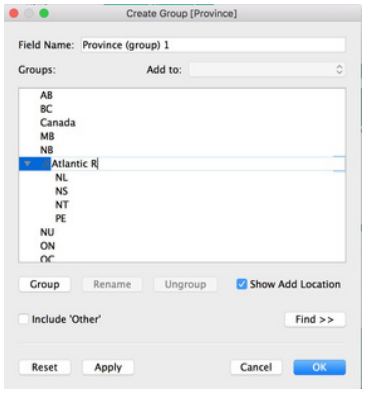


Next, we're going to create custom territories in our map. This may be useful to look at trends in certain geographic areas on the map. To do this, click on Province in Dimension. From the drop-down menu, choose Create, then Group (Image 1). In the box

that opens (Image 2), you can group provinces together based on custom sub-groups.
1) 2) 3)



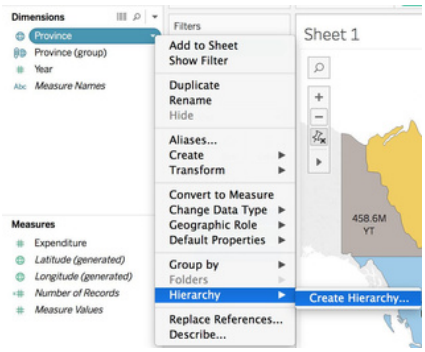


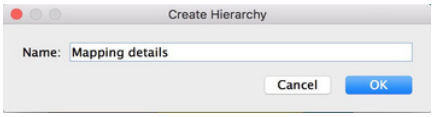


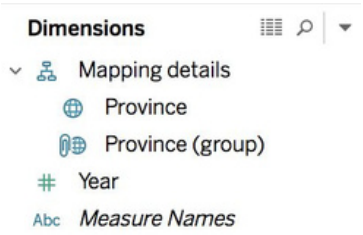
We are going to group ours based on regions in Canada. I am first going to select using the command key NL, NS, NT, PE to create a sub-group for Atlantic Canada (Image 2), click Group, then name it Atlantic Region (Image 3). I can repeat this for all regions in Canada. Click OK when finished to create all the groups and return to the main page.

Now returning to the main page, I should see under Dimension a field called Province (group). If I drag this new field to the Marks section, it can be applied in a variety of ways to the map. But, I want to apply it in a way to create a map that groups expenditures based on these regions. So, I need to create a hierarchy of my geographic region fields. To do this, I will click on Province in Dimensions and select Hierarchy from the drop-down menu and then create Hierarchy (Image 1). From the Hierarchy dialogue box that appears, name the Hierarchy something, such as Mapping details (Image 2), then click OK. Province will now appear under Mapping details in Dimensions. Drag Province Group under this Hierarchy as well. Dimensions should now look something like Image 3.

1) 2) 3)

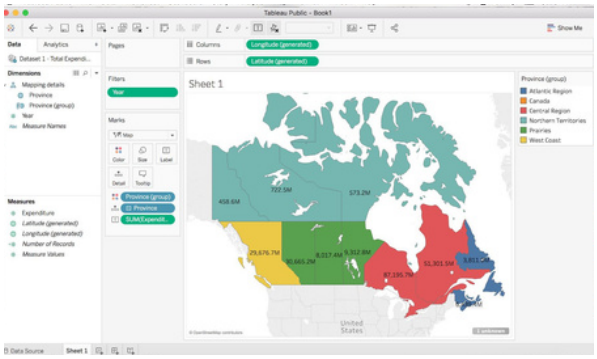


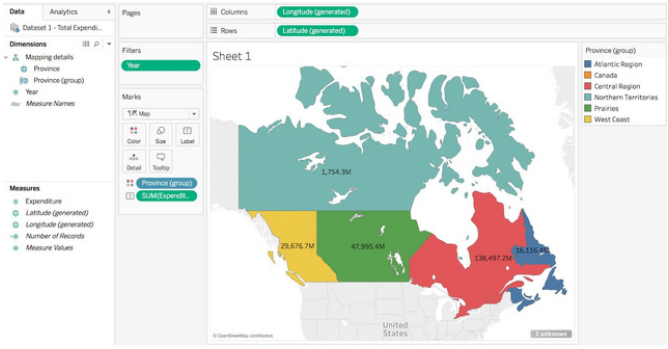




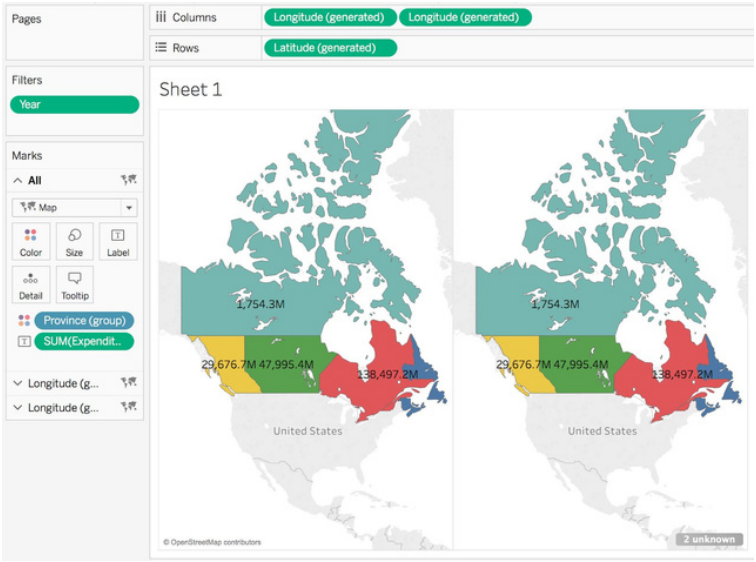
Having this Hierarchy made will now allow us to visualize expenditures based on the geographic regions we created.

To do this, I will drag Province (group) to Colour in the Marks box. You will see the map will change and be coloured by the geographic regions (Image 1). Then, I will remove Province from the Marks box, and the expenditures for each province will sum to the region (Image 2):
1)2)

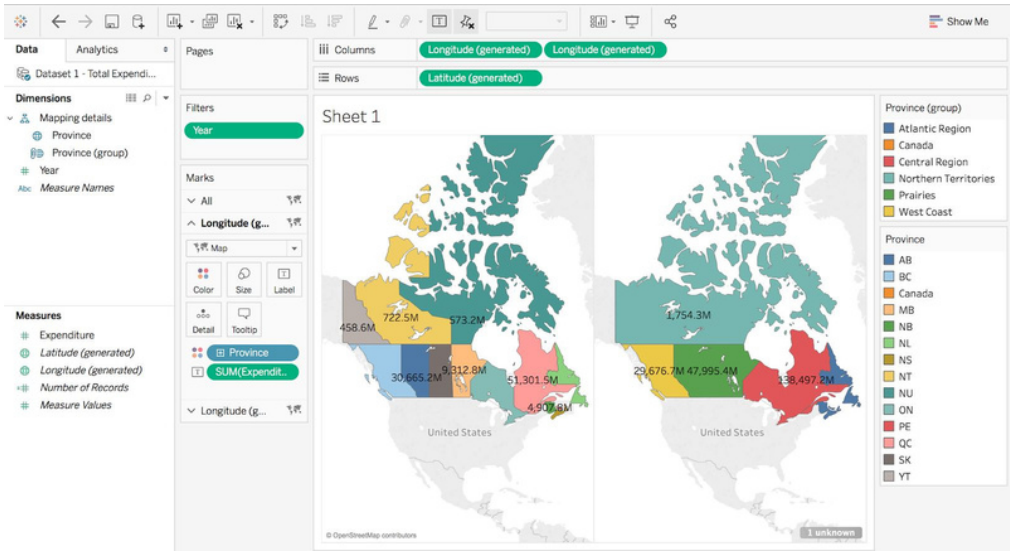




Now I want to compare between expenditures by region and province, so I want to create a dual axis map. So, I will drag Longitude or Latitude to the Columns or Rows shelf, respectively, depending on what axis I want my second map to appear (Longitude ➔ Columns for besides one another, Latitude ➔ Rows for on top of one another). For this example, I want the maps beside one another like so:



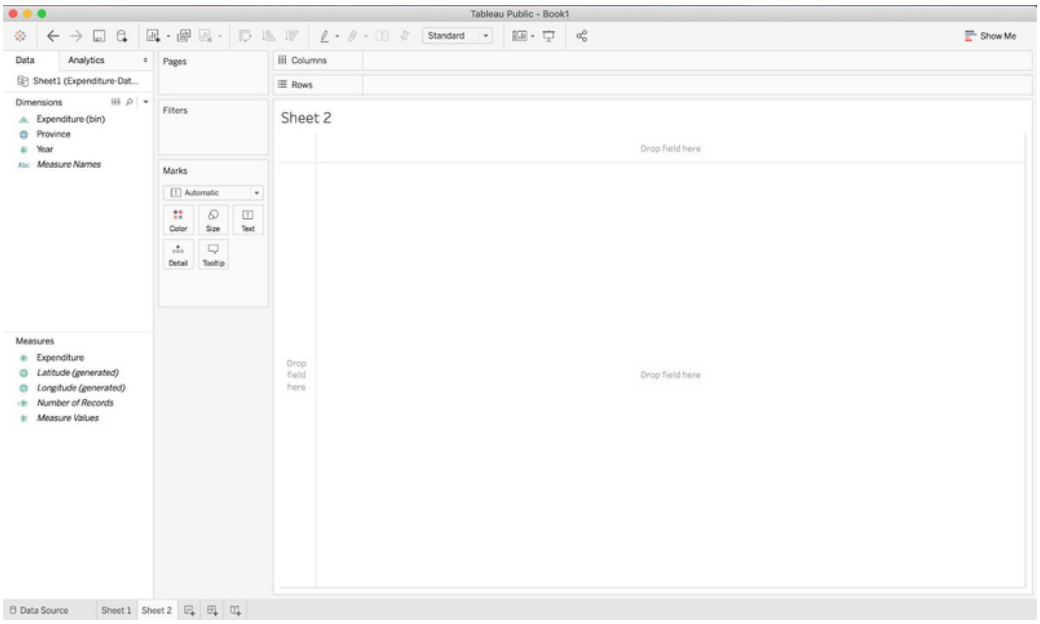
Now to change the map on the left to display expenditure by province, I will click on Longitude Generated tab to open up a Marks for just the left province. Here, I will drag Province from Dimensions to Colour. The map on the left should change to show expenditure by province, while the right map remains the same. Your screen should look like this:



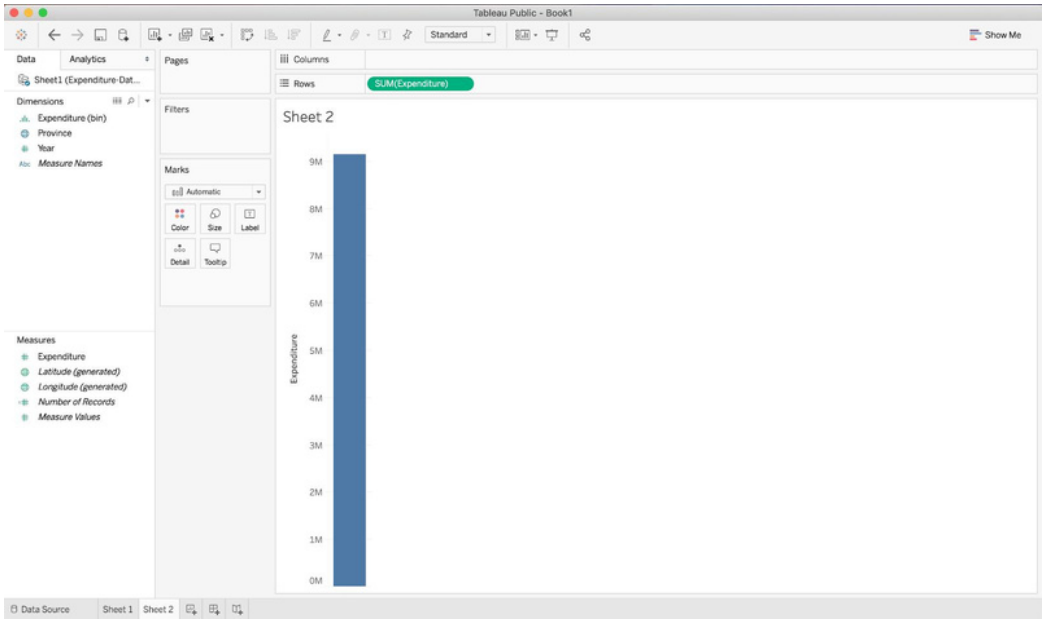
Congrats! You now have a Dual Axis Map to compare between provinces and regions the healthcare expenditures of each.

II.CREATING A LINE GRAPH OF CANADIAN HEALTH EXPENDITURE BY PROVINCE IN 1975-2018

Next, we are going to create a line graph of each province's health expenditure from 1975-2018. We are going to continue to use the same data as in the previous example, so we do not have to return to the data source tab. Click on "New Worksheet" located at the bottom right of your screen next to Sheet 1 to add a new sheet. Your screen should now look like this:

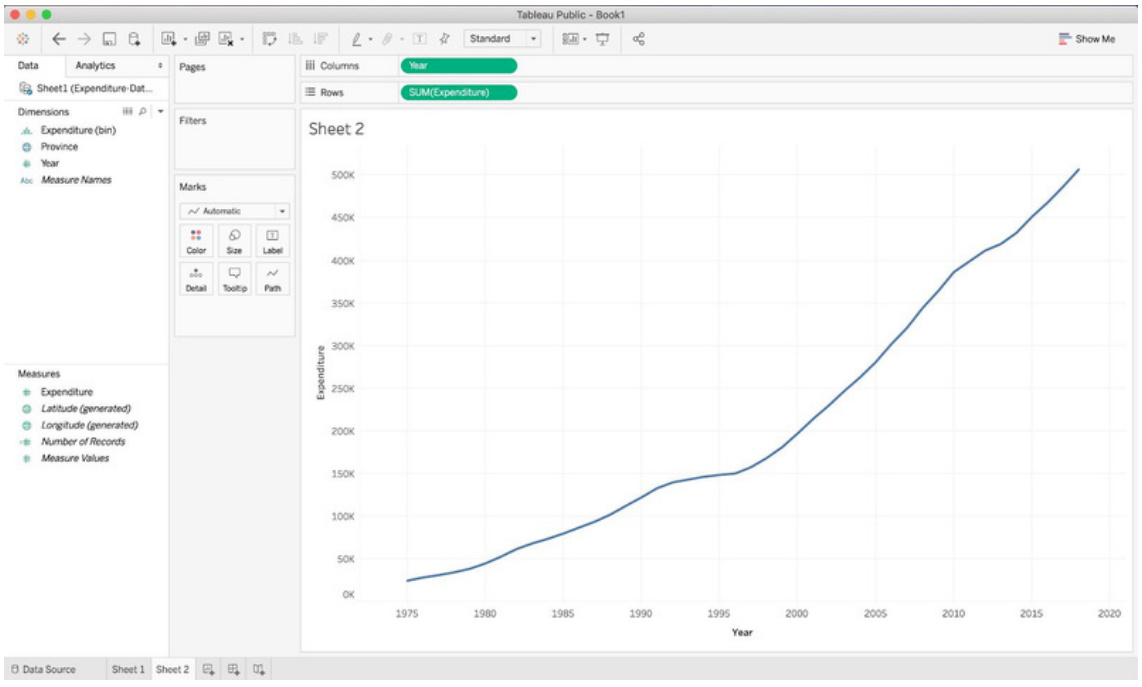


To begin building your line graph, double click on “Expenditures” in the Measures field. Your screen should now look like this:



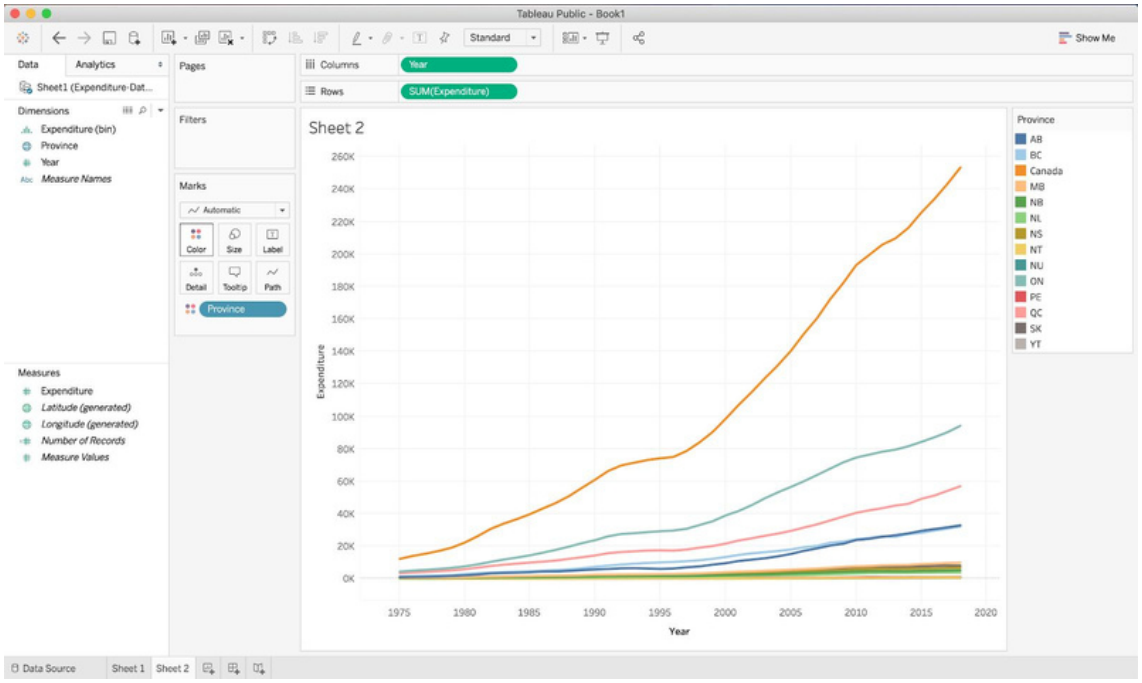
You will see that Tableau has summed the health expenditures from the years 1975 to 2018 and has placed this value in the Row shelves.

We are now going to double click on “Year” in the Dimensions field.

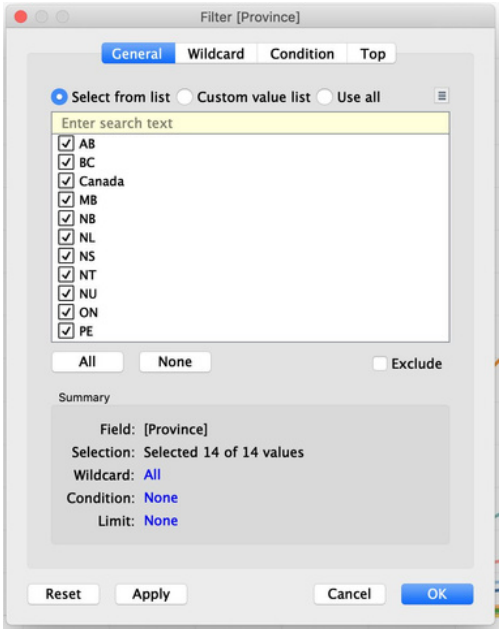


This line graph is showing the summed health expenditures across all provinces on the x-axis and year on the y-axis. We can continue to edit this graph to compare health

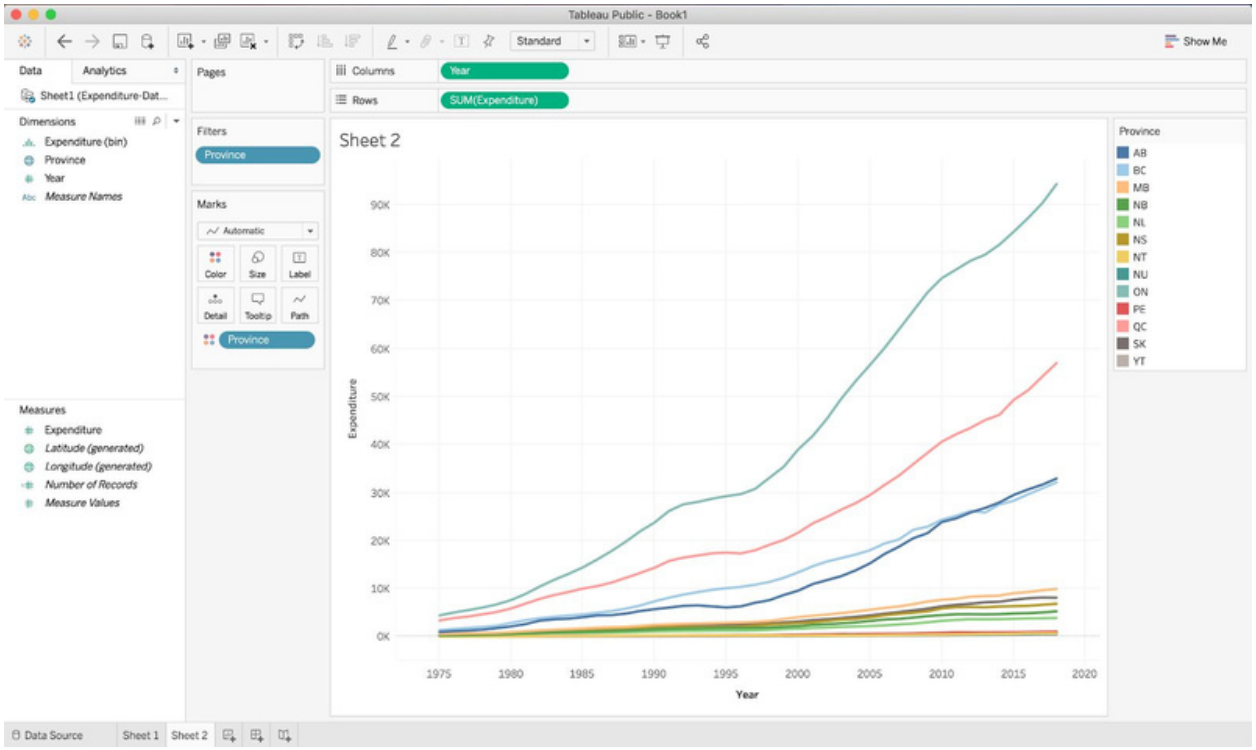
expenditure by each individual province. To do this, double click on “Province” in the Dimensions field.



You will see that the summed health expenditure for all of Canada is still be represented on the map, which is denoted by the orange line. We can edit this by dragging “Provinces“ from the Dimensions field into the Filters box. This box should appear:



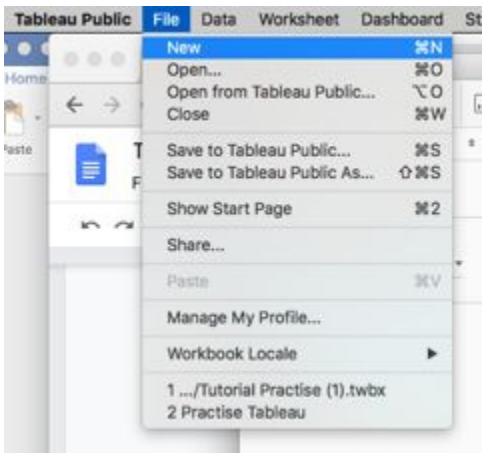
De-select “Canada” and then press “OK”. Your graph should now look like this:



You can change the colour schemes of the line graph similar to how we changed the colour on the map in the previous example. Just click on “Color” and then “Edit Colors” and select the palette of your choice from the drop-down menu.

VISUALIZING THE PROPORTIONAL DISTRIBUTION OF HEALTH CARE EXPENDITURE AMONG AGE GROUPS IN CANADA

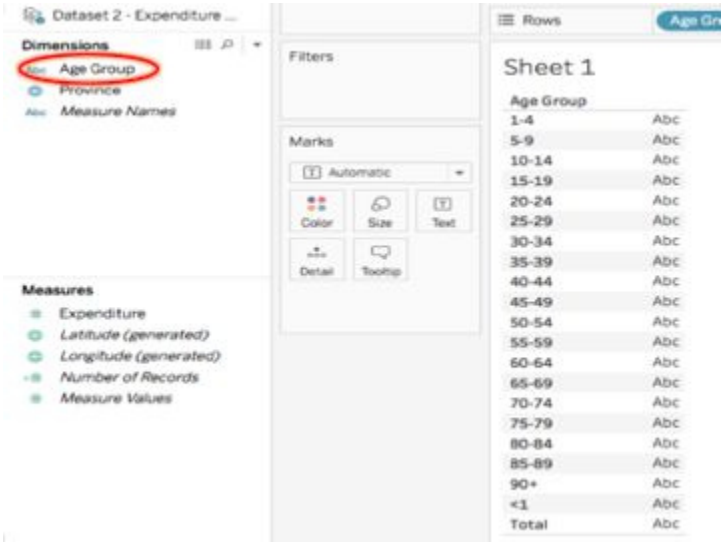
This section uses a new set of data. To create a new Tableau Public workbook with the new data, click the “New” button under the “File” tab.



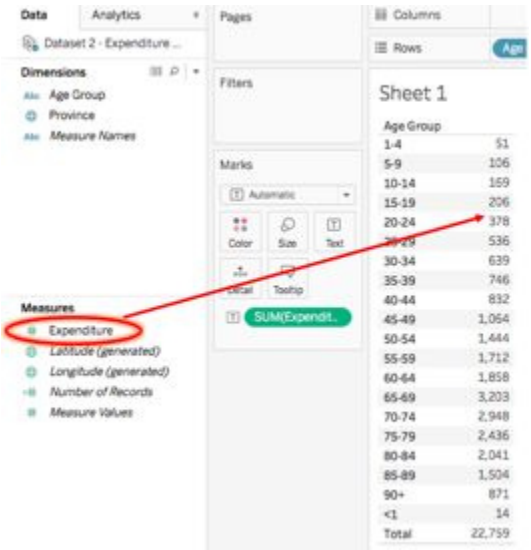
Using the same data uploading method as earlier, select “Dataset 2 – Expenditure by Age” from the sample data and open a new sheet.

There are several methods of visualizing the proportional distribution of data in Tableau Public. On the first sheet, you will be creating a stacked bar graph comparing health care expenditures between provinces while also visualizing the distribution amongst age groups. On the second sheet, you will create a pie chart that visualizes the distribution of Canada's total expenditure among age groups.

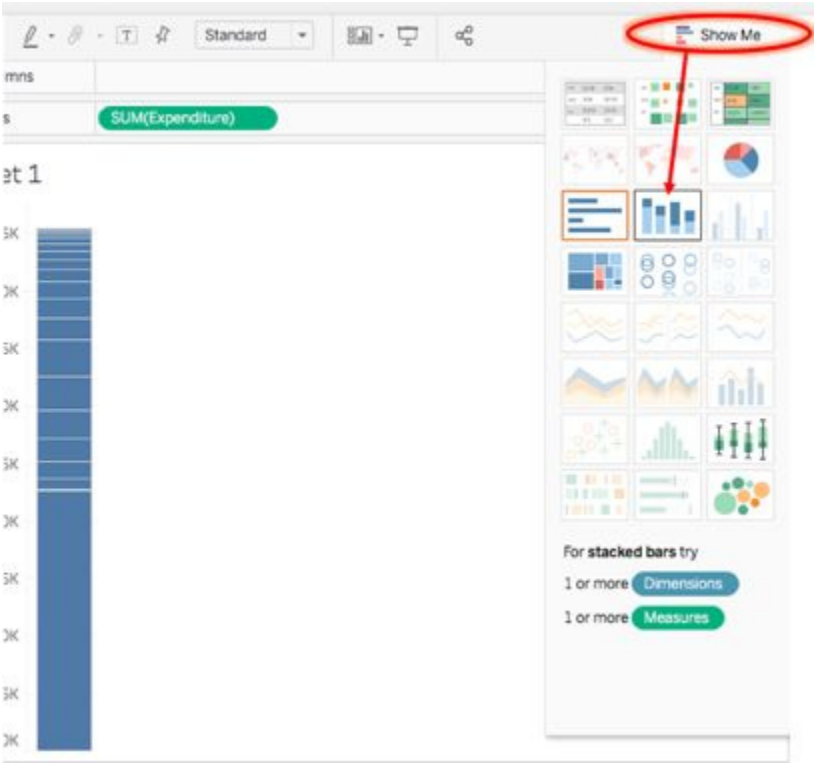
On the first sheet, start off by double-clicking on the dimension "Age Group." A chart should appear showing the age groups.



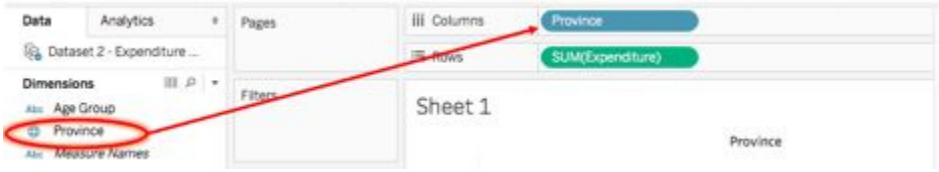
Next, drag the "Expenditure" measure onto the undefined data column (Containing "Abc") on the chart. The chart then lists the total Canadian expenditure for each age group.



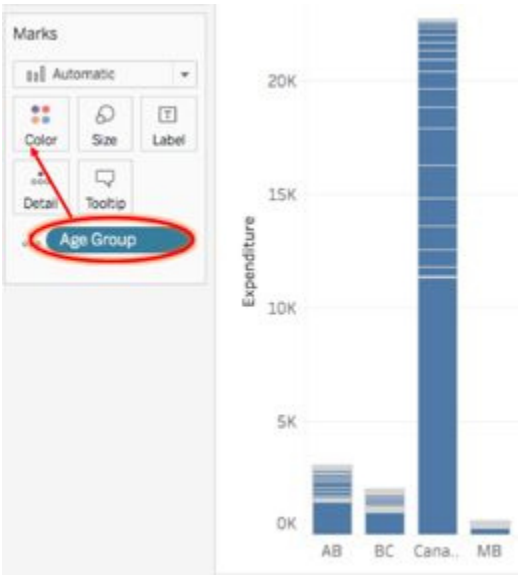
Click on the "Show Me" tab at the top right of the page to display a variety of data visualization techniques. If you already see the bar open, do not click on it. Then, select the "stacked bars" option to transform your data chart into a stacked bar graph.



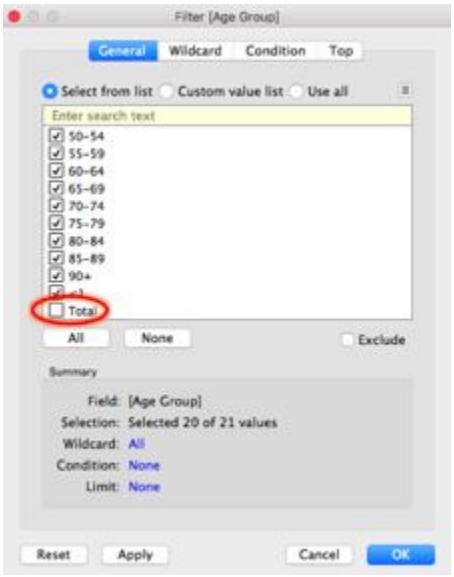
Now, divide the expenditure data into its provincial distributions. Do this by dragging the “Province” dimension into the “Columns” bar near the top of the page.



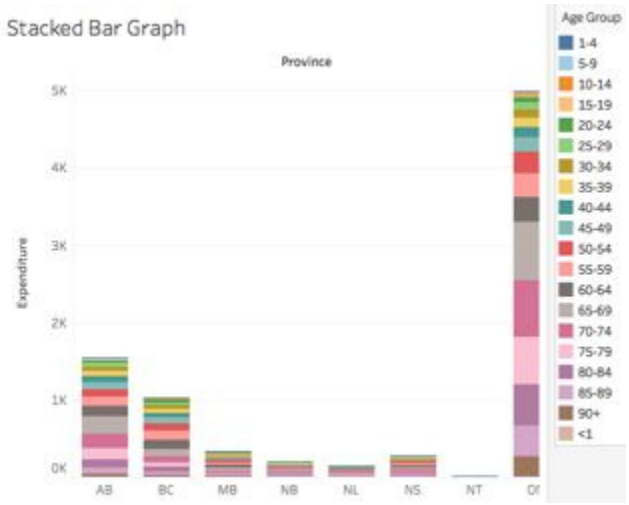
Now to add some colour to the graph to visualize the proportions better. Drag the blue “Age Group” mark to the “Color” square.



You may notice that half of each bar is one colour. This is because the “Total” value for each province is still being included. To remove this measure, drag the “Age Group” dimension to “Filters” and de-select “Total” in the “General” tab. If you wish to also remove the large bar that represents Canada’s total expenditure from the graph, repeat this step with the “Province” dimension and de-select “Canada” from the list.



Your stacked bar graph is now complete! If you wish to make the graph larger or smaller, press shift+command+B or command+B, respectively. Or you can go to the “Cell size” option in the “Format” tab.

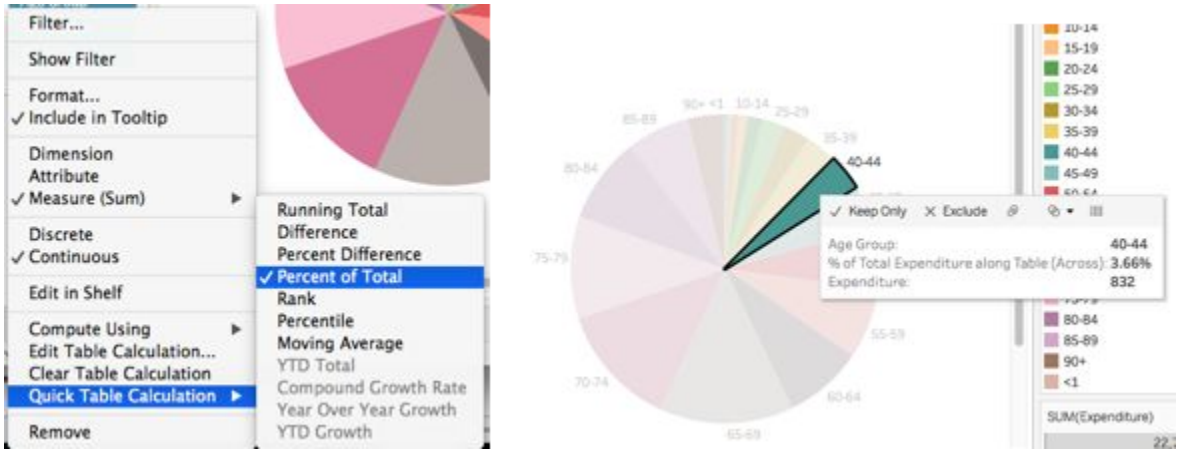


Open a new sheet again to get started on your pie chart. To begin, double-click “Age Group” and drag in “Expenditure” the same way you did to start your stacked bar graph. You should again end up with a chart displaying age groups in the left column and their respective expenditures in the right column. This time select the “pie charts” option from the “Show Me” menu.

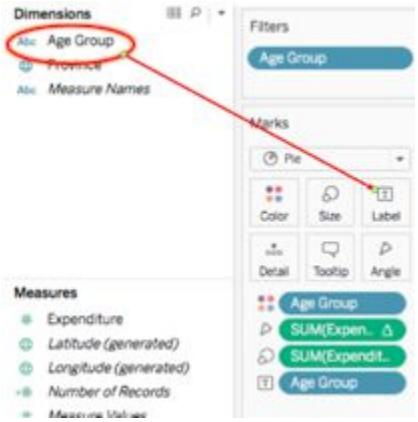
Just as you did so when making the stacked bars, add filters to remove data from the “Total” age group. You should now have a pie chart with a slice & colour representing each age group.

When hovering over each slice, the respective age group and expenditure value should be displayed. Another helpful piece of information is the percent of the total expenditure

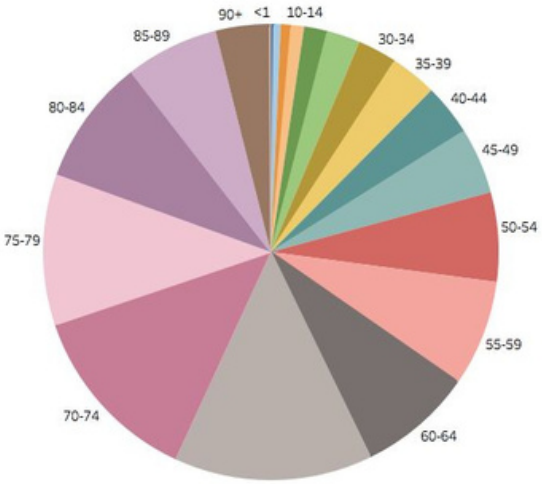
allocated to that age group. To add this info, click the arrow on the right of one of the green “SUM(Expenditure)” buttons in the “Marks” box. Then hover to “Quick Table Calculation” and select “Percent of Total.” This both ensures that the slices of the pie are proportionate to their respective percent of total expenditure, and will also display this information when you click on a slice of the pie chart.



To add labels to the pie chart, drag the information that you want labelled onto the “Label” box. For example, you can label the slices according to age group.



Your pie chart should now be complete! Again, if you wish to make the chart larger or smaller, press shift+command+B or command+B, respectively. Or you can go to the “Cell size” option in the “Format” tab.



Congrats! You can now visualize the proportional distribution of your own data! You're also ready to add that data to an interactive dashboard!