Project Documentation

Team: FirstRow
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Description of the goals of your project

With advances in medical standards and technology, there is no denying that people are living longer today than in the past. But for some reason, not everyone benefited equally from the gains in life expectancy. We are especially interested in how females, as a vulnerable group, differ in life expectancy in different countries. The World Bank provided data on female life expectancy for 263 countries from 1965 to 2015. Therefore, this visualization using the World Bank Data make user explore the question:

Question: How has female life expectancy varied by country over the past 50 years?
Goal: Visualize World Bank Data make user explore the question

Rationales for design decisions

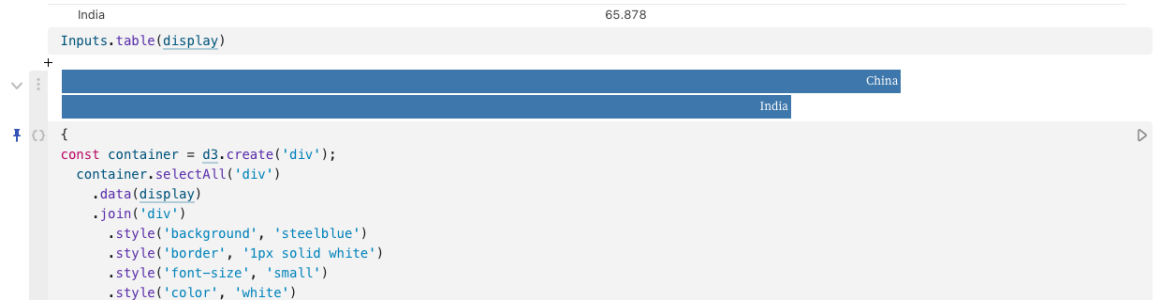
We thought the map is the best way to show the differences worldwide. Therefore, we decided to use the map to illustrate the country's gap in female life expectancy. To help readers figure out the comparison more intuitively, the range of color was utilized to show the female life expectancy values.

After we finished the first visualization. It is surprising that some countries' colors become lighter. It is counter-intuitive that in some countries the female life expectancy has decreased over time. However, the color changes are difficult to capture clearly. The line chart is a better choice to see how the data change. Originally, we would like to use a line chart to show these countries specifically. However, we thought that we should give the readers the opportunity to find this insight and let them explore more for their targeted countries. Finally, we chose to include all the countries' data. Using the line chart, it is easy to figure out the decreasing lines among increasing lines. The interaction allows the reader to see the country name of the decreasing lines, such as Rwanda, Namibia. The visualization attracts users to find the reason behind this phenomenon. For example, we found that the reason why Rwanda's female life expectancy decreases is due to poverty and illness[1].

[1]LIFE EXPECTANCY IN RWANDA AND ITS CONNECTION TO POVERTY. https://borgenproject.org/life-expectancy-in-rwanda/

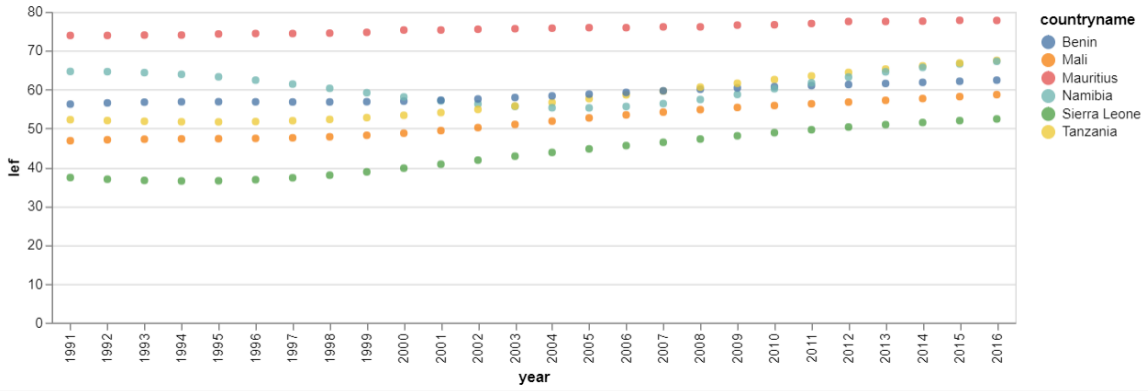
Other alternatives we considered:

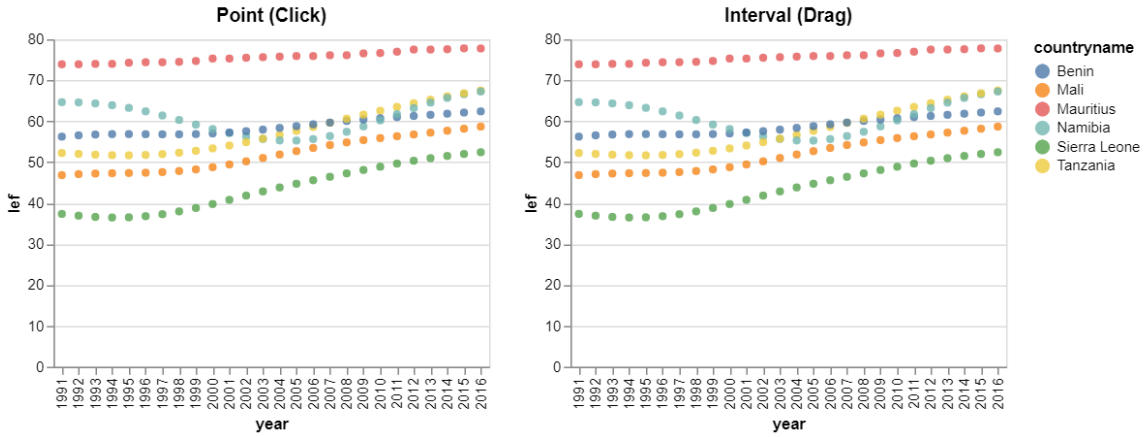
- Bar Chart

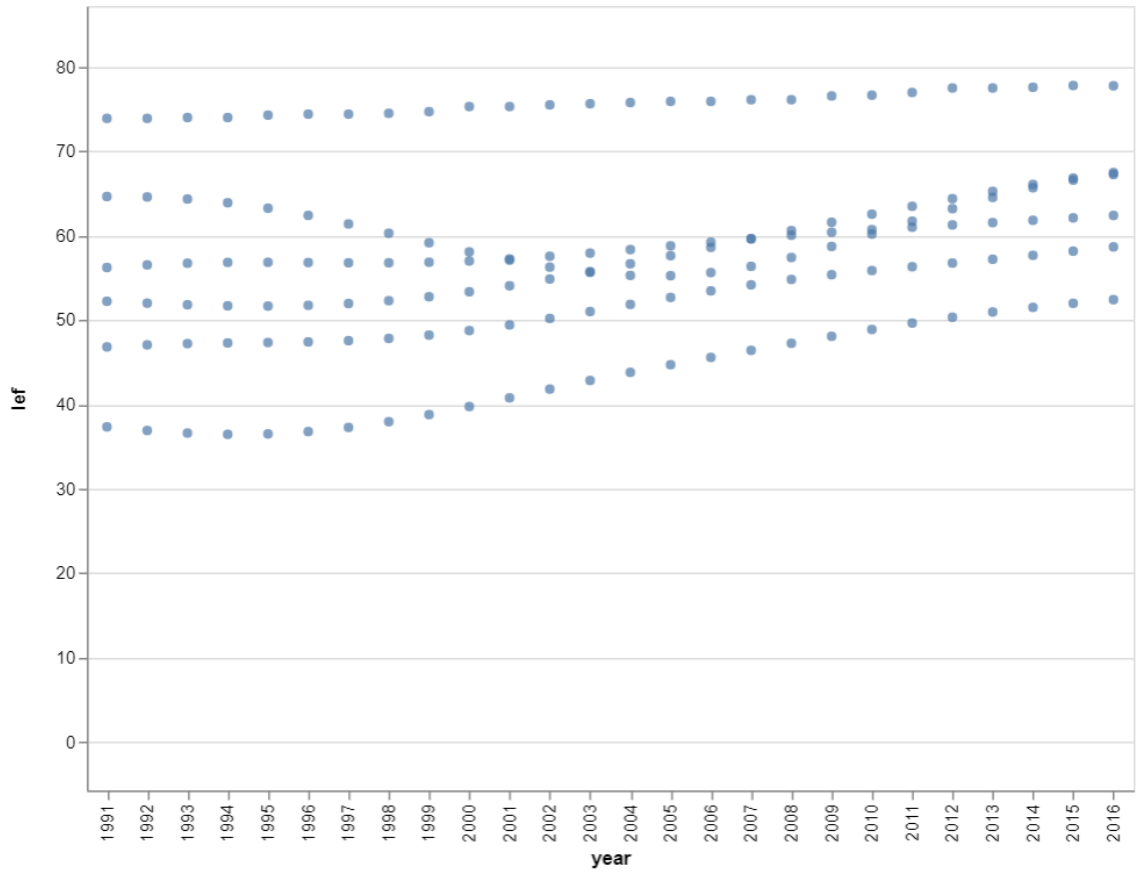


The original function:
When clicking the certain countries, the specific countries' data will be shown using the bar chart.
The reason why we didn't choose it:
We couldn't realize the immediate interaction, the bar chart will be shown after running its code. We decided to use the line chart to illustrate the data.

- Some Vega-Lite Charts







The original function:
Selection, SelectInterval, Zoom function of 6 countries data which show the declining trend over time.
The reason why we didn't choose it:
We would like to use all countries' data using a line chart performed by D3.

Visual encodings:

Visual encodings: The map illustrates the country's gap in female life expectancy worldwide. The range of the color is also utilized to show the years' differences in life expectancy. Low life expectancy is shown in light yellow while high life expectancy is shown in dark blue. When the "year" changes, the colors will change accordingly and give the audience a general sense that life expectancy goes higher.

The lines in the line chart are set to be half-transparent and lightweight so that the various lines are not that indiscernible. When the mouse hovers on a certain line, we also make that line stand out.

Overview of the development process

Timeline	Team member	Work
9/28-10/5	Zijing Lu & Liujing Ren & Chengyu Chen	Preparation: Brainstorm and discuss the idea. Find the proper dataset. Perform exploratory analysis.
10/5-10/8	Zijing Lu & Liujing Ren & Chengyu Chen	Try to use d3 to draw a bar chart.
	Liujing Ren	Translate the csv file to the array. Draw the map. Add the hover technique.
10/8-10/13	Chengyu Chen	Advance the hover technique. Draw the corresponding bar chart when the countries are clicked (The final version didn't include this function).
	Zijing Lu	Learn how to draw the map and line chart using D3.
10/14-10/16	Chengyu Chen & Zijing Lu	Draw the line chart - Part 1 Draw the alternative visualizations using the Vega-Lite (The final version didn't include these).
10/17-10/18	Liujing Ren & Chengyu Chen	Draw the line chart - Part 2
10/18-10/19	Chengyu Chen	Try to advance the hover function.
	Zijing Lu	Write the documents.

In total, our team spent about 30 hours developing the application.

The process of formatting the csv file to fit in the packages and methods provided in D3, the interactive color setting, and the line chart drawing took the most time.