Worldwide COVID-19 Confirmed and Death cases Analysis (Narrative Visualization)

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1. MESSAGING

Question - What is the message you are trying to communicate with the narrative visualization?

An ongoing COVID-19 pandemic is causing major outbreak across worldwide. This has led to not only economic losses to countries and individuals but also took tolls of human lives.

In this data visualization I have shown how every country in the world has been affected by COVID-19. At first I have shown confirmed cases and deaths until now (Jan2020 – July 2021) in every country in a very interactive manner, and then educated our audience by stating which countries have most number of confirmed cases and deaths.

Along with the presentation of worldwide COVID-19 data to our audience, I have pulled their attention to United States, and presented a detailed picture how USA battled with this pandemic. I have shown a detailed trend of COVID-19 confirmed cases and deaths from the start of outbreak and until now. While showing the trend, our audience can see the months when COVID first and second wave came and when vaccination started. By showing trend, they can visualize how vaccination helped to control this outbreak. At last, I have also done a comparative analysis of confirmed cases and deaths in each state in USA, by visualizing bar graphs, our audience can easily detect, which states had maximum or minimum confirmed cases and deaths in every month of pandemic from the start and until now.

Data used in this narrative visualization comes from publicly available COVID-19 NY times dataset. [1]

2. NARRATIVE STRUCTURE

Question - Which structure was your narrative visualization designed to follow (martini glass, interactive slide show or drop-down story)? How does your narrative visualization follow that structure? (All of these structures can include the opportunity to "drill-down" and explore. The difference is where that opportunity happens in the structure.)

We have used **interactive slideshow** feature of Narrative Visualization with drill down and explore opportunity to show our COVID-19 confirmed cases and deaths analysis.
There is a straightforward path directed by the author using previous and next buttons. However, in every scene viewers can drill down to more information, if they need to know more information pertaining to that scene.

Such as in Scene1 and Scene2, where we have shown confirmed and death cases in every country in a map form, viewer can hover over map of any country and can view Confirmed and Death cases. Similar way in Scene 3, viewer can hover over Confirmed and Death trend and can find confirmed and death cases aligned to their reporting dates. Similarly in Scene 5 and Scene 6, viewer can click on any pandemic month (January 2020 – July 2021) and can see cumulative confirmed and death cases reported by every state in United States.

If viewer does not want to drill down to more information, author can navigate slideshow interactive visualization by clicking Previous and Next buttons. We have also shown important facts and events by using annotations.

3. VISUAL STRUCTURE

Question - What visual structure is used for each scene? How does it ensure the viewer can understand the data and navigate the scene? How does it highlight to urge the viewer to focus on the important parts of the data in each scene? How does it help the viewer transition to other scenes, to understand how the data connects to the data in other scenes?

In order to have visual consistency to have maximum impact to our audience, we have used color visualization effectively to differentiate confirmed cases and death cases, (blue color is used to represent confirmed cases while red color is used to represent death cases) and same consistency has been followed in every scene.

Scene layout, background color, type of font, and font colors are consistent in every scene, so user can swiftly navigate from one scene to other and easily understand the information provided in every slide.

Annotations are effectively used in multiple slides to draw the attention of user in various important events such as in which month first and second wave came in United States? Which countries had most confirmed and death cases etc. Same color scheme (purple color with triangle tip) is used to show annotation in every slide.

As Example – in Scene1 and Scene2, we have used blue and red color respectively to show confirmed and death cases. We have also used a spectrum (shade) of blue color and red color from light towards darker shade to represent fewer and more cases. Hence a viewer can easily understand that light blue color in any map shows fewer confirmed cases in that country while darker blue color in any country shows more confirmed cases. Same strategy is used with death cases in Scene2. When user hover over any country in Scene1 and Scene2, in tooltip popup we have used

same color-coding blue and red to show confirmed and death cases counts.

While showing the confirmed and death cases trend in Scene3, we have used same blue and Red color visual consistency to effectively represent our information to user. In Scene 3, when user hover over the trend curve, we have also used same font color too as blue and Red to display confirmed and death cases counts. Similarly, in Scene4 and Scene5, same colors are used to show confirmed and death cases in every state.

In Scene4 and in Scene5, we have used bar chart to display comparative analysis of confirmed and death cases across various states, as we know position and length are best to display quantitative discreet data.

4. SCENES

Questions - What are the scenes of your narrative visualization? How are the scenes ordered, and why?

There are total 5 scenes in my narrative along with one extra introductory scene about this narrative visualization. All these scenes share same layout and color scheme.

Scene1 shows a world map with all the countries properly demarcated and colored using blue color in different shades (from lighter to darker) ordering according to numbers of confirmed cases. Buy using tooltip feature, viewer can hover over any country map and see exact number of COVID-19 confirmed cases and using the annotation feature can view which are the top three countries having most confirmed cases until now. By using the different shades of blue, viewer can easily determine, which countries are having most and least confirmed cases without hovering.

Scene2 shows exactly similar world map as Scene2, but now it shows death cases in every country. Again user need to hover over map of the countries if he wants to see death cases in any specific country. Annotation is used to show the top 3 countries which are having most death cases until now.

Now from Scene3 to Scene5, we are drilling down to COVID-19 cases specific to USA. In Scene3 we are showing trend of confirmed and death cases in US from starting until now. If viewer need more information, he can move over the slider in either trend graph and see exact confirmed and death cases in a specific date.

Scene4 and Scene5 drilling down US Covid cases state-wise, in one hand Scene4 shows comparative analysis of confirmed cases monthly basis on the other hand, Scene5 shows state-wise cumulative death cases monthly basis. Here viewer can click on any pandemic month (January 2020- July 2021)and see what was the confirmed and death cases count and it can also compare with other states.

Ordering of Scene – At first, we have showed worldwide Covid confirmed and death cases in Scene1 and Scene2, which draws attention of our audience about this pandemic worldwide. Once they see a high-level picture, we keep narrowing or drilling down Covid information. At-first we focus to one country that is US, we show COVID confirmed and death cases trend in all the pandemic months and then further again drill down to state-wise details. With this sequencing, at-first we draw attention of our audience by showing a high-level picture and slowly take them to more granular level of details. This way they can be focused throughout our slideshow and we can effectively convey our message.

5. ANNOTATIONS

Question - What template was followed for the annotations, and why that template?

D3 annotation library developed by SusiLu is used to create annotations, it helped me to follow a template (font color: #8600b3 – font type: Arial, font size: 19Px) which was consistent across all scenes.

It was very easy to design the annotation and convey the message using this library. All the annotations provided great visual structures and color contrast to convey important information and draw audience attention to those information.

At first, I used general annotation in Slide1 and Slide2 to display countries which has maximum covid confirmed cases and death case and after that also used tooltip annotation after mousehover event in a country map which shows total cumulative confirmed and death cases in that country.

Apart from Scene1 and in Scene2 I used general annotation in Slide3 to display various important events in whole pandemic duration such as when (which month) covid first and second wave came in United States. When vaccination started and how vaccination helped to reduce spread of covid in United States.

Again, In Scene3, we have used a circle in the trend graph as an annotation, where viewer can scroll circle over the confirmed and death trend graph and can view confirmed, death cases count against its reporting date.

Question - Do the annotation change within single scene and why?

I have used general annotation as well as tooltip mouse hover annotation in various scenes, general annotations are fixed and does not changes in a single scene, however tooltip mouse hover annotations used in scene3 to show confirmed cases and death cases changes against reporting date changes as reporting date change in the trend graph.

6. PARAMETERS

Question - What are the parameters of the narrative visualization? What are the states of the narrative visualization? How are the parameters used to define the state and each scene?

There are total 5 scenes in this narrative visualization and each scene act as a state. Previous and Next buttons show on left and right-side help author to navigate from one state to other state, are defined as parameter. By clicking on these previous and next buttons state of the visualization can be changed, it will take viewer from one state to other.

7. TRIGGERS

Question - What are the triggers that connect user actions to changes of state in the narrative visualization?

We have used mouse click in the next and previous button (page navigation buttons) in each scene as a trigger. Blue color Next and Previous button in every scene inform user that they can move forward and backward using these buttons. These trigger connect user action to change of state in each narrative visualization scene.

In Scene1 and Scene2 mouse click on title hyperlink as Worldwide Confirmed Cases and Worldwide Death Cases act also as trigger. Grey color and hyperlink in Scene1and in Scene2 inform audience that they can switch from one scene to other. In similar way in Scene4 and in Scene5 title hyperlink as state-wise Confirmed and state-wise death Cases also act as trigger.

Mouseover on the country on the world map in Scene1 and in Scene2 will also act as trigger event which will show country name, confirmed and death cases as tooltip.

Mouseclick on months in Slide4 and in Slide5 will also act as Trigger which will show cumulative state-wise confirmed and death cases.

Question - What affordances are provided to the user to communicate to them what options are available to them in the narrative visualization?

Previous and next buttons in every page are colored as Blue and show top left and right side, which viewer can easily see, upon mouse click it changes the color from Blue to Red.

Other Trigger event such as hyperlink in Scene1, Scene2 and in Scene3, Scene4 are underlined and initially displayed as grey (it means user can click them), upon clicking it changes color to Blue and Red. In same way, all months in Scene4 and Scene5 are displayed as button so that viewer knows that they are clickable.

8. REFERENCES

[1] COVID-19 NYTimes dataset: https://github.com/nytimes/covid-19-data

[2] D3 Java Script Library: https://d3js.org

[3] Interactive Data Visualization using D3: https://towardsdatascience.com/interactive-data-visualization-with-d3-js-43fc3428a27e

[4] Story telling with D3.js: https://dustinewers.com/telling-stories-with-data-building-interactive-data-visualizations-with-d3-js/

[5] D3 Annotations using SusiLu: https://d3-annotation.susielu.com