

## Final Project Part 1 – Ugly Sketch & Prototype

### What is the Question?

In finding a question to explore for the (In) Tolerance prompt, I was immediately drawn to the second definition of this word discussed in class: *A capacity to endure. Resilience*. These words immediately struck me as a summary of the past year under COVID-19. As we are finally close to seeing the light at the end of the tunnel of this Pandemic (As I write this, I am scheduled for being vaccinated this Friday!), I wanted to capture the resilience that we, as a global society, have had to COVID-19 in my final project. My question is thus : “How have we as a society begin to rebound from COVID?” I wanted to keep this question broad so that the dataset that I end up with can help define what rebounding means and what form it takes. I’m particularly interested in seeing the recent effects of vaccines so I’m also interested in the question of “Can we see the global effects of vaccination taking place?” I initially was inspired by this visualization from Reddit:

[https://www.reddit.com/r/dataisbeautiful/comments/mlxivl/oc\\_are\\_covid19\\_vaccinations\\_working](https://www.reddit.com/r/dataisbeautiful/comments/mlxivl/oc_are_covid19_vaccinations_working) , although I thought the scatter chart was not an impactful way to relay the data.

### The Dataset

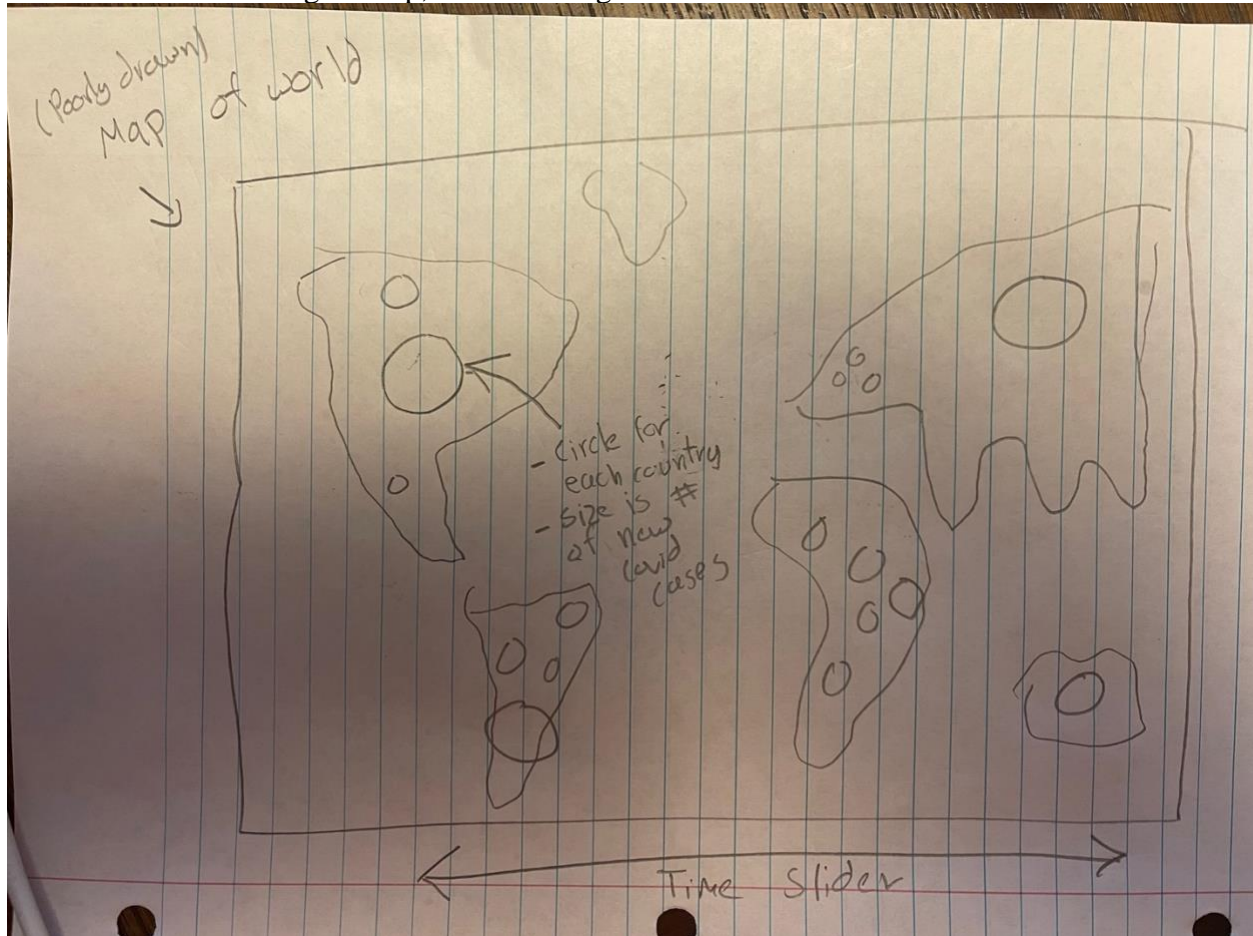
The dataset I am using comes from <https://github.com/owid/covid-19-data/tree/master/public/data>. This data is courtesy of the organization ‘Our World in Data’, whose mission is to use research and data to make progress against global problems. The dataset from this website has various statistics about covid cases and vaccination progress for countries around the globe broken down by day. It also has statistics about the countries themselves, such as its population, median age, and GDP. For my first passthrough of this project for prototyping, I truncated this data down to several columns, shown below:

iso_code	continent	location	date	new_cases_smoothed_per_mi	people_vaccinated_per_hundred		
AFG	Asia	Afghanistan	2/24/20	0	0		
AFG	Asia	Afghanistan	2/25/20	0	0		
AFG	Asia	Afghanistan	2/26/20	0	0		
AFG	Asia	Afghanistan	2/27/20	0	0		

Based on this initial structure of the data, I’m interested in looking at COVID cases over time by country and seeing the effect of vaccinations on COVID cases.

## Sketch 1

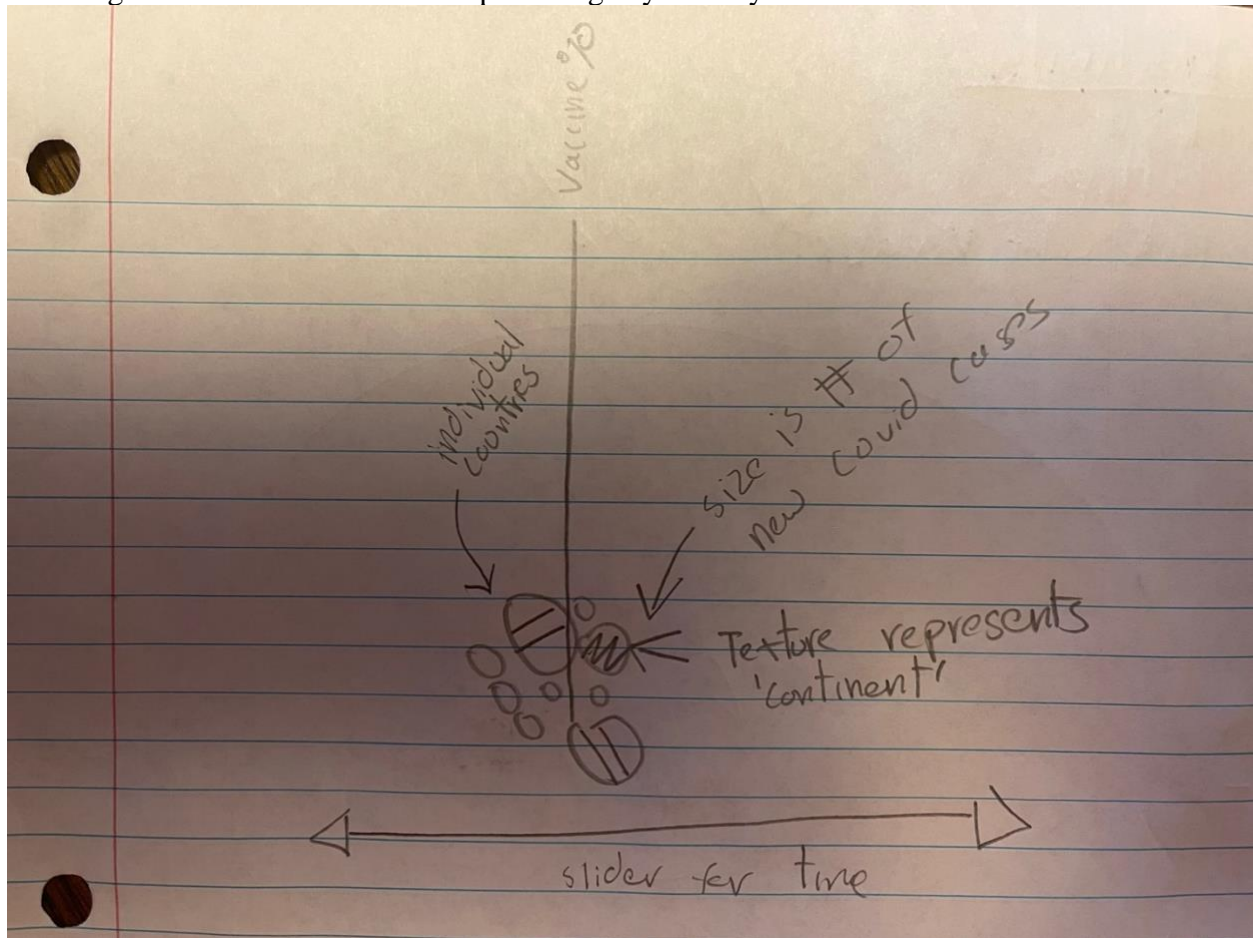
Based on the dataset above I began to develop some initial sketches to figure out how to encode the data. Due to the geographic nature of the data, my first thought went to encode a way to visualize the data through a map, shown through the sketch below:



In my (poorly) drawn map above, I thought about placing circles over each country, whose size is proportional to the COVID cases for that country on a specific date. Color could also be used on each circle to represent some other variable in the immense dataset above. To add an element of interactivity, there could be a slider at the bottom that would change the date being shown. The hope would be that as you move the slider to the right, you could see distinct trends in the size of the COVID cases and the 'rebound' that we globally make in response to COVID-19. My main problem and struggles with this graph is that we don't really get a view of the direct effect of vaccinations on the rebound effect – additionally I think this strictly geographic graph is definitely 'playing it too safe' for a final project!

## Sketch 2

For my second graph, I attempted to break out of the geographic structure and focus more on encoding the variable of vaccination percentage by country:

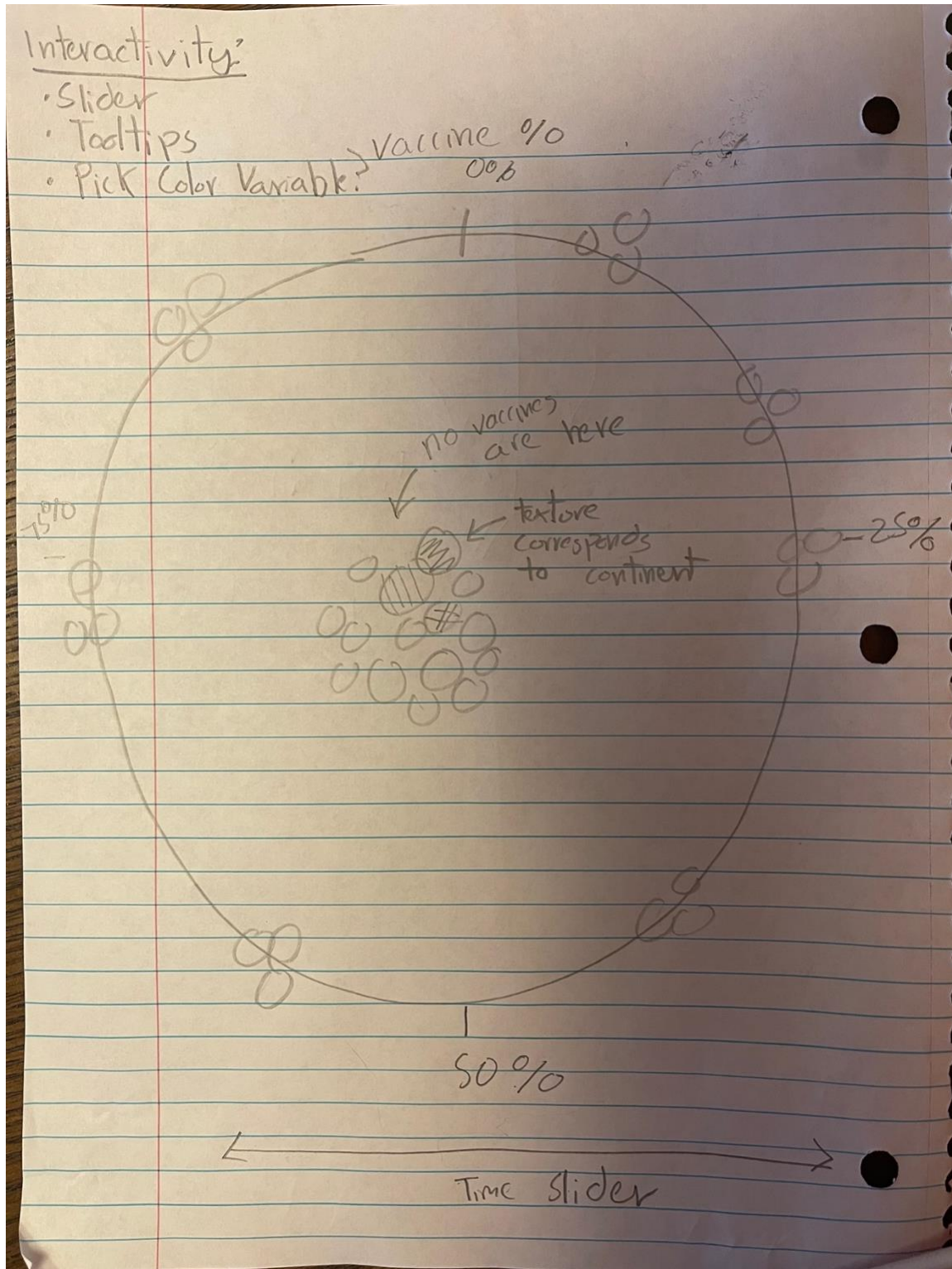


Above we still have the interactive slider for date, but now we have a single y axis that represents vaccination percentage. The circles still represent the same thing: countries and their size proportional to COVID cases. To maintain some notion of geography the fill of the circles could correspond to a color for a specific continent. As the slider (date) changes, the circles would float 'upwards' as their vaccination percentage increases and we could hopefully see an 'upside down' funnel effect as the circles get smaller and smaller as vaccinations increase. The problem and struggle I have with this graph is that I think it still occludes the effect of vaccines – with all the circles jumbled down '0%' for 90% of the past year I want it to be more noticeable for when a country starts vaccinations—I wanted to visually represent the 'exciting jump' when a country vaccinates its very first citizen!



### Sketch 3

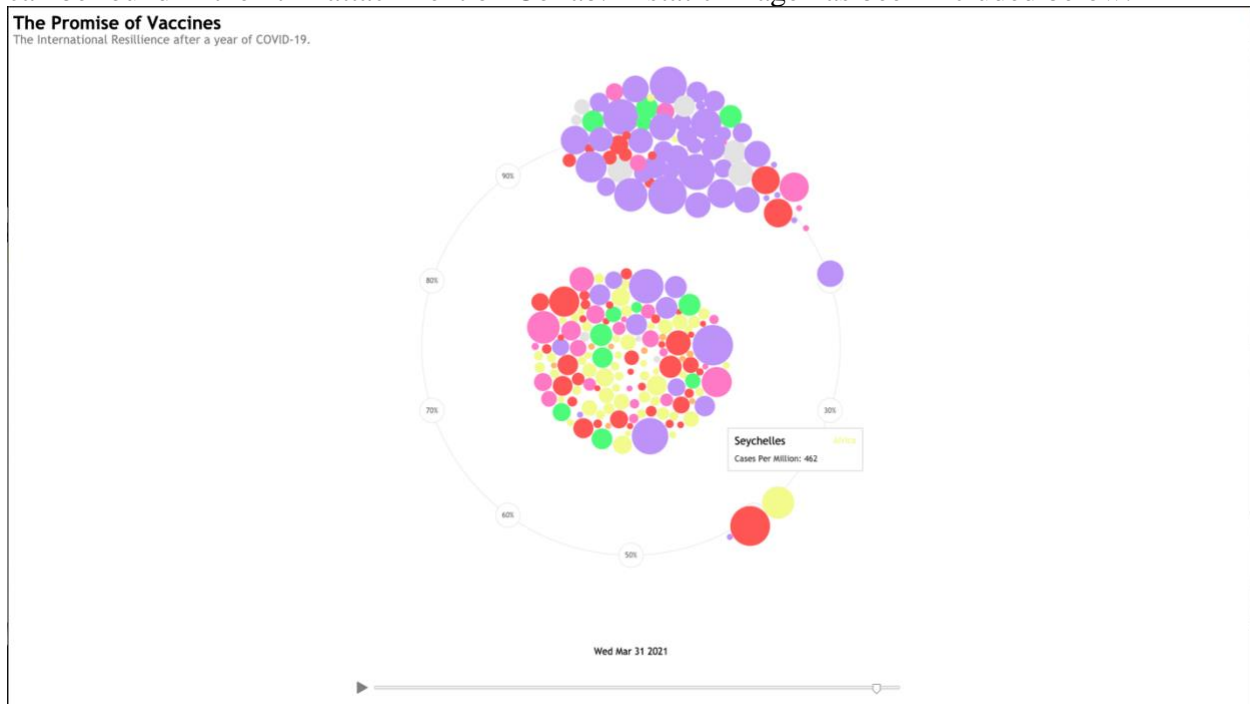
To capture the exciting 'jump' for a country starting vaccinations, I ended up with the circular sketch below:



In the visual paradigm above. All the countries start at no vaccinations and in the center of the graph (This is the case for the majority of the timeline for the past year as vaccinations are a fairly recent occurrence). The circles and colors represent the same thing as in sketch two: countries with size proportional to covid cases, colored by continent. As the slider moves through time, the circles change in size as COVID cases go up and down... but the moment that a country starts vaccinating it will zoom to the top of the outer ring, representing the start of vaccination. From this moment on, that country will start to 'travel' around the outer ring (just like a clock) as vaccine percentage for a country goes to 25%, 50% and beyond. I think this representation is extremely powerful as the metaphor of a clock is universally understandable and this graphic above corresponds to the passage of time. At the top of this sketch, I also note several additional possibilities for interactivity, including tooltips that can give more info (country name, actual number of COVID cases), and maybe some radio group to select the variable to color circles by. I especially like this sketch vs. sketch 2 above because I think it puts unique emphasis on the notion of vaccinations. Additionally, by spreading out the hundreds of countries around both the center of the circle and around the ring, I envision the graph to be less cluttered.

## Prototype

After drawing the final sketch above, I wanted to expand upon it with a prototype in d3, which can be found in the html attachment on Collab. A static image has been included below:



I am very happy with this initial prototype of the graph – I am proud of the interactivity of the slider and how you can scroll to a specific date and pause and play at will. Additionally, I think the presence of the tooltips allows users to further explore countries that they wish to know more about. I learned a lot about using the 'd3 force layout' to make svg objects repel and attract each other – it's really neat how this runs in a physics simulation! I feel that the force element to the

graph makes it seem more natural than abruptly changing the sizes/colors of svg's when the date changes, or even including a CSS transition. I think this is a great first step at answering the question of 'How has Society begun to bounce back after COVID? In the graph once you get to the stage of vaccination, it is really amazing to see how the size of circles starts to shrink as countries move around the 'vaccination ring'. However, this question is not completely answered – the trend mentioned above does not correlate perfectly; further refinement of this graph and addition of more variables can explore other avenues to answer this question. I have also included in the attachments on Collab an initial prototype for the static visual for the final submission – I expect this to greatly change as the d3 graph above is iterated upon.

### **Prototype Struggles and Next Steps**

I currently have several struggles with the prototype above. First, since vaccinations only start happening in the recent months and the data spans for over the past year, the viewer has to either wait a long time to see vaccinations start or scroll to the very end of the slider. This is a cumbersome process, and perhaps I can include a way to fast-forward through the initial values so that viewers don't get bored. Additionally, I think that although this graph is really novel and unique, we do lose the geospatial notion of the data – I need to continue to explore other avenues for this representation. Finally, I want to incorporate more user action into the graph – I currently think it would be a great idea to explore having the user have the ability to change the variables that is represented by the color of each circle (country GDP, median age, etc..).