Process Book

Visualization Final Project

Niki Ekstrom, Sydney Levy, Aida York

Week 7: Project Proposal

Topic: Out of School Rates and General Student Educational Outcomes Globally

Title: The Global Education Puzzle: Unpacking Out-of-School Rates and Pandemic Disruptions

Abstract:

The level of education students are able to obtain varies greatly around the world. We plan to explore how out-of-school rates compare between countries around the globe, including gender differences in out-of-school rates. Further, we are interested in the effect that the Covid-19 pandemic had on students' educational outcomes, as many students had trouble continuing their education during this time. We hope this project brings light to the educational inequities that were exacerbated by the Covid-19 pandemic. We will use different methodologies from class to compare a variety of facets of our data, hoping to draw interesting conclusions visually.

Datasets

- Global Out of School Rates (https://www.kaggle.com/datasets/komalkhetlani/out-of-school-rates-global-data)

- School Closures caused by the pandemic
  (UNESCO: https://covid19.uis.unesco.org/global-monitoring-school-closures-covid19/)
  (https://www.kaggle.com/datasets/konradb/school-closures-caused-by-the-covid-19-pandemic)
  (https://www.kaggle.com/datasets/mpwolke/cusersmarildownloadsclosurecsv/data)

Week 8: Team Agreement & Detailed Project Plan

Team Agreement

- We will communicate through a text group chat that we have set up. We will have weekly in person meetings on Wednesdays either before or after Visualization Lecture.
- All members of the group will be involved with the design, implementation, and critique of the project.
- We will collaborate on the implementation of the project through a Github repository, where each person will have a branch for development on different aspects of the project. Each group member will have a visualization that they are in charge of, while also getting feedback from other group members.
- Work will be split as evenly as possible (in terms of hours spent) to ensure fairness and equal learning opportunities.
- There will be honest communication if any members are non-performing.
    - Possible Punishment for Non-Performing Members: respond to 209A Quiz in class.
- Task assignments
    - Aida: Target, Evaluate
    - Niki: Design, Implement
    - Sydney: Data Wrangling, Implement (help Niki)
- Signatures:
    - 
- Date: 10/29/2023

Basic Info

- Project Title: The Global Education Puzzle: Unpacking Out-of-School Rates and Pandemic Disruptions
- Names: Niki Ekstrom, Sydney Levy, Aida York
- Email Addresses:
    - nikiekstrom@g.harvard.edu
    - sydneylevy@g.harvard.edu
    - ayork@g.harvard.edu
- Team name: Omicron

Background and Motivation

All of us were college students during the Covid-19 pandemic and were all impacted in different ways, whether this be through remote learning, being an international student with different time zones, and varying Covid-19 policies by school / country. The consequences of the Covid-19 pandemic are still seen today. The three of us all had resources to be able to continue

our studies during the pandemic, but we know that not all people were this fortunate. Thus, we are interested in the global impact of the pandemic on the student educational outcomes.

Related Work: Anything that inspired you, such as a paper, website, and visualizations we discussed in class.

- Our newly acquired knowledge of dynamic updates in visualization will be the foundation for our project.
- This website uses global out-of-school rates data to visualize the numbers across different countries. It uses UNESCO data and provides other data sources that could be helpful for our project.
  (https://resourcewatch.org/data/)
- The impact of COVID 19 on smaller and rural elementary school
  (https://www.theplf.org/2021/12/07/when-the-next-best-step-is-backwards/?gclid=Cj0KCQjwhfipBhCqARIsAH9msbltAe38lE-6ZLAIrBF-xxH0PMtHA2gsNXhIjqP64BEBYSeMhFijZl8aAgSUEALw_wcB)
- Effects of COVID 19 on School enrollment in the U.S.
  (https://www.sciencedirect.com/science/article/pii/S0272775721000479)

Data

Our main data source will be Kaggle. We have identified several datasets that can be used for our visualizations.

- The first one is a dataset that provides information about out of school rates in the world, and contains information about the rates for different regions, gender, and type of area (urban/rural):
  https://www.kaggle.com/datasets/komalkhetlani/out-of-school-rates-global-data/data?select=Lower+Secondary.csv

- The second and third datasets are related to school closures during the COVID-19 pandemic. The first dataset contains the school closure status for every country for each day over several years while the second dataset provides the closure information for a specific date (that is not necessarily the same for each country)
  (https://www.kaggle.com/datasets/konradb/school-closures-caused-by-the-covid-19-pandemic)
  (https://www.kaggle.com/datasets/mpwolke/cusersmarildownloadsclosurecsv/data)

Data Cleanup

All three data sources have datasets that are compiled into CSV files, which makes the data easy to work with. The global out of school rates dataset has quite a lot of missing values for some of the columns/features. For example, data on the percentage of females and males out of school is available for only 47% of the countries, and information about the percentage of

out-of-school children in rural or urban areas is available for only 48% of the countries. We will explore the data in further detail and then determine what to do about the missing values. If we decide to process the data to handle the missing values, we will use Python for the processing and to generate new data files that can be used for our visualizations.

While this dataset is mostly complete, there are a few missing entries related to countries and dates. Notably, 8 countries are missing, but these can be manually populated using the "country_name" column. Additionally, 13 missing dates can be retrieved by cross-referencing the World Bank website, where the data was originally sourced. These missing values can be addressed without much difficulty.

This dataset is well-maintained and does not have any missing values. However, it is quite large, necessitating careful management and efficient data handling.

For the out-of-school rates analysis, we plan on comparing out-of-school rates between countries and regions, investigate gender disparities in out-of-school rates, and explore differences in out-of-school rates between rural and urban areas. Using the COVID-19 datasets, we plan on examining the school status for each country over time, group countries by regions and analyze school closures on a regional level, and find trends of school closures status over time.

The integration of these datasets allows for a holistic analysis. For instance, we can explore whether countries with higher out-of-school rates also experienced higher rates of school closures during the pandemic. This cross-referencing will enable us to draw valuable insights about the interplay between education disparities and the impact of the COVID-19 pandemic.

Audience Questions

- The audience for our project are those in the educational community, whether it be professors, students, or family / community members who supported learners and educators throughout the pandemic.
- The primary questions we are trying to answer are:
    - What educational outcomes were most impacted by the Covid-19 pandemic?
    - How did these outcomes differ by country / region?
    - How can educational outcomes be improved for students as the pandemic is waning yet still ongoing?
- Overarching Goals and Objectives
    - Better understand the impact that the pandemic had on students globally
    - Understand the views of education experts and any advice they have for improving student outcomes
    - Visualize the data to see if it supports the views of education experts

To-Do List (Task, Deadline, Person responsible)

- Create Github Repo & share with team, Wednesday Nov 1 9:59 pm, Sydney
- Find relevant articles on topic / overview, Wednesday Nov 1 9:59 pm, Aida
- Exploration of Datasets / key variables, Wednesday Nov 1 9:59 pm, Niki

Personal Skill Assessment

	Target	**Data Wrangling**	**Design**	**Implement**	**Evaluate**
Aida	2	4	3	1	5
Niki	3	4	5	1	2
Sydney	4	3	1	3	5

Week 9: Map

As a team, your discussion should focus on the following questions:

- Who is your audience? Come up with **at least three** options and pick one target audience.
    - Three potential audiences for our visualizations include international aid organizations, educators, and students / their families.
    - For our project we will choose International Aid Organizations as our target audience.
- Describe your target audience in more detail. What do they know? What are their interests? What visualization literacy do they have? At what level of detail will you present information to them?
    - They are interested in giving aid to developing countries and making education more accessible to different populations.
    - They know the impact that improving education has positive effects on economic development and innovation.
    - They believe that education is a basic human right that correlates with improving health, stability, and conflict reduction.
    - Improving education is a driver of increased equity and inclusion, especially for women.
    - They tend to use simpler visualizations, such as line graphs, pie charts, scatter plots, and histograms.
    - We would present information to them at a country level because any action they would try to take based on the information needs to be specific to the country they are working with. Different governments/countries have different needs and goals so we would want to tailor the information to each country.

- What questions about your data will be interesting for your audience? Come up with a list of interesting questions that your audience may have about your data. The more, the better, but your team should come up with **at least ten questions**.
    - 1) What countries have the highest out-of-school rates?
    - 2) Which countries/regions were most affected by the pandemic in terms of education outcomes?
    - 3) Were females more likely to be out of school than males? Does this effect differ by country?
    - 4) Does a student's socio-economic status affect their out-of-school rates?
    - 5) Does living in a rural area lead to higher out-of-school rates than those in the urban areas?
    - 6) How did out-of-school rates change over time?
    - 7) How did access to online learning during the pandemic vary by country and region?

    - 8) How did the number of weeks a school was closed during the pandemic vary by country and region?
    - 9) What modalities of distance learning were present across countries during the pandemic?
    - 10) Where should aid be focused on to try to revitalize education across countries?

- What data do you have? Download the data you picked from the website linked in the PDF that describes the data (available on Canvas, week 2). Look at it in Excel or Google spreadsheet and briefly describe each attribute and its data type (categorical, ordinal, or quantitative) in your process book. It's OK if you are unsure about the data type for some attributes - you can simply describe them (e.g., geographic location).

Out of School Rates

- **ISO3**: Three-digit alphabetical codes International Standard ISO 3166-1 assigned by the International Organization for Standardization (ISO). For example, Belgium is BEL.
    - Categorical
- **Countries and Areas:** Country Name
    - Categorical
- **Region**: Region Name
    - Categorical
- **Sub-region:** Sub Region Name
    - Categorical
- **Development Regions:** Economies are currently divided into four income groupings: low, lower-middle, upper-middle, and high and accordingly countries are classified
    - Ordinal
- **Total:** Total % of children who were out of schools
    - Quantitative, continuous
- **Female:** % of Female who were out of schools
    - Quantitative, continuous
- **Male**: % of Male who were out of schools
    - Quantitative, continuous
- **Rural_Residence:** % of children who were out of school and were residing in Rural area
    - Quantitative, continuous
- **Urban_Residence:** % of children who were out of school and were residing in Urban Area
    - Quantitative, continuous
- **Poorest_Wealth quintile:** Poorest indicates % of children that fall in the Poorest Wealth quintile
    - Quantitative, continuous

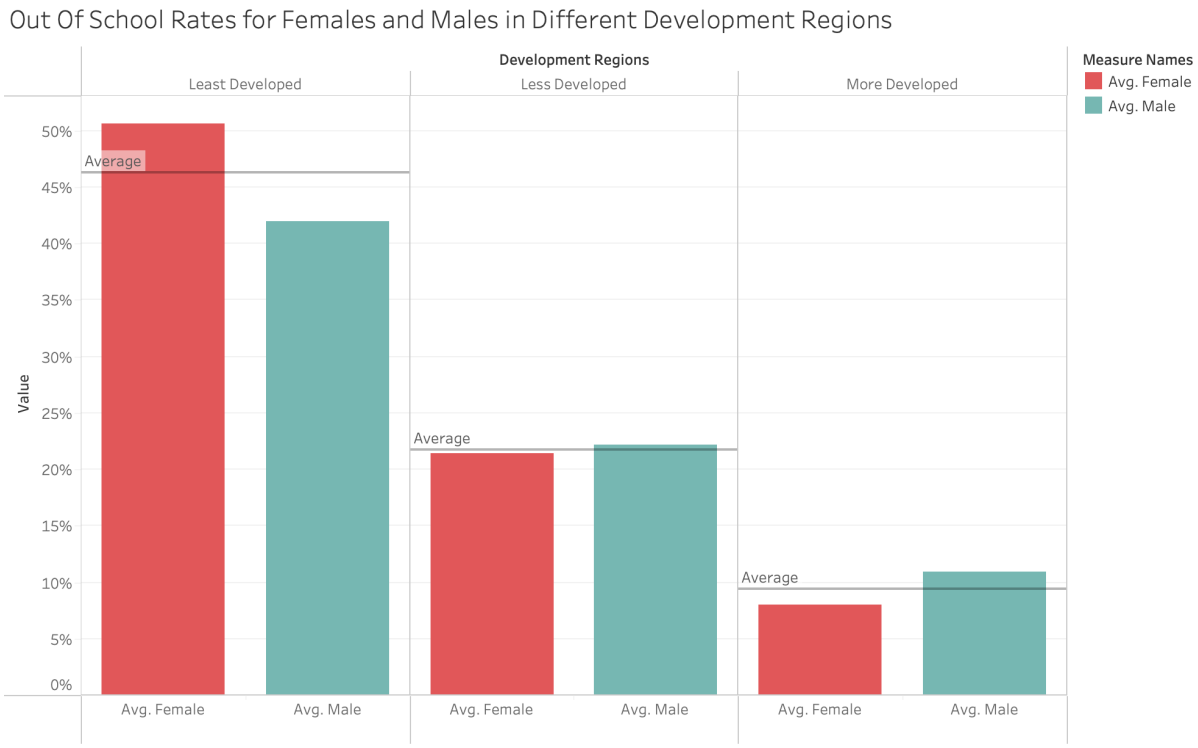
    -
- **Second_Wealth quintile:** Second Richest indicates % of children that fall in the Second Richest Wealth quintile
    - Quantitative, continuous
- **Middle_Wealth quintile:** Middle indicates % of children that fall in the Middle strata of Wealth quintile
    - Quantitative, continuous
- **Fourth_Wealth quintile:** Fourth Richest % of children that fall in the fourth strata of Wealth quintile
    - Quantitative, continuous
- **Richest_Wealth quintile**: Richest indicates % of children that fall in the Richest strata of Wealth quintile
    - Quantitative, continuous
- **Data source**
    - Not really an attribute, simply information that we can use when evaluating the credibility of the data
- **Time period**: Represents the year(s) in which the data collection (e.g. survey interviews) took place.
    - Categorical

School Closures Caused by the COVID-19 Pandemic (UNESCO)

- **Date:** Reference date
    - Categorical
- **Country ID**: Country ISO Alpha-3 cod
    - Categorical
- **Country**: Country name (English)
    - Categorical
- **Region Type 1**: This attribute will not be used, every entry has the value “EC” which stands for United Nations Economic Commission
- **Region 1**: United Nations Economic Commission regional grouping, for example ECLAC: Latin America and the Caribbean
    - Categorical
- **Region Type 2**: Sustainable Development Goals regional grouping
    - This attribute will not be used, every entry has the value “SDG”
- **Region 2:** Sustainable Development Goals regional grouping, for example, SDG: Latin America and the Caribbean
    - Categorical
- **Region Type 3:** Sustainable Development Goals Regional grouping
    - Categorical

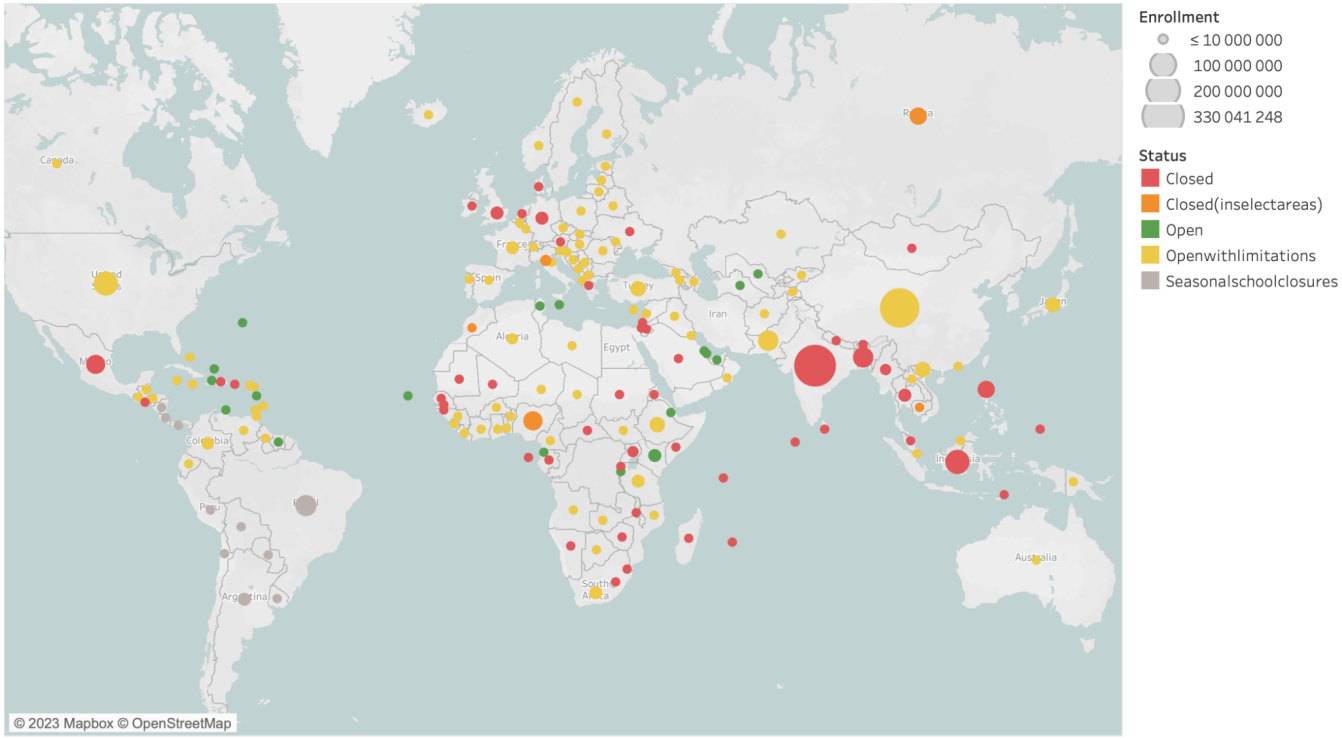
- **Region 3**: World Bank country income grouping
    - Categorical
- **Status**: Status of school closures
    - Categorical
- **Enrollment (Pre-Primary to Upper Secondary)**: Number of students enrolled in pre-primary and upper secondary
    - Quantitative
- **Teachers (Pre-Primary to Upper Secondary)**: Number of teachers in pre-primary and upper secondary
    - Quantitative
- **School Age Population**: School Age Population (Pre-Primary to Upper Secondary)
    - Quantitative
- **Distance learning modalities (TV):** Existence of distance learning modalities (TV) in the country
    - Categorical
- **Distance learning modalities (Radio):** Existence of distance learning modalities (Radio) in the country
    - Categorical
- **Distance learning modalities (Online)**: Existence of distance learning modalities (Online) in the country
    - Categorical
- **Distance learning modalities (Global)**: Existence of distance learning modalities (combination of TV+Radio+Online) in the country
    - Categorical
- **Weeks partially open:** Weeks partially open
    - Numerical
- **Weeks fully closed**: Number of weeks schools were closed
    - Numerical

Niki:



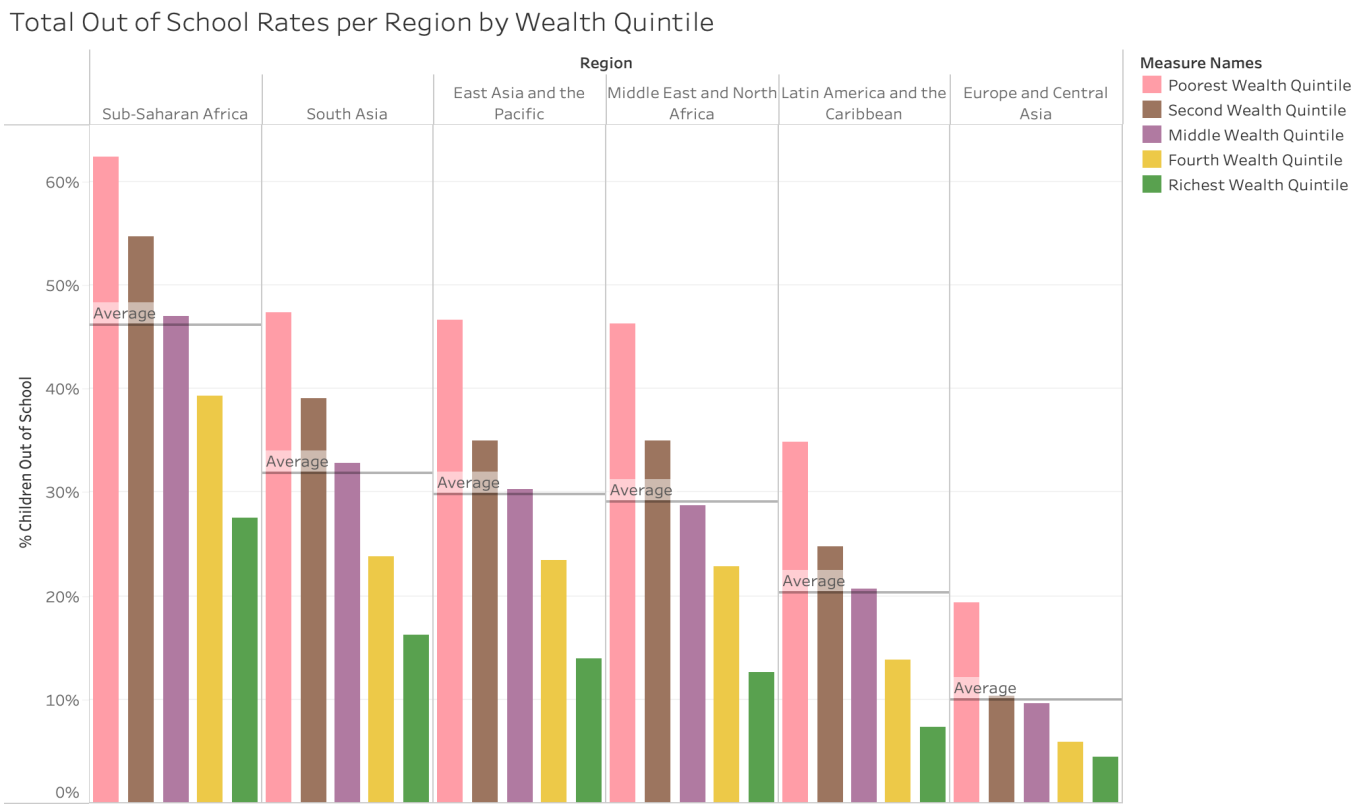
The question that we came up with as a team that this visualization most closely answers is “3) Were females more likely to be out of school than males? Does this effect differ by country?”. This visualization examines whether females exhibited a higher likelihood of being out of school compared to males within three distinct developmental regions (categorized as least, less, and more developed). The reason I grouped the columns by development regions rather than countries is that it was difficult to create a clear visualization with all countries that did not involve a map, and the dataset for out-of-school rates did not include latitude and longitude values that makes it possible to make a map. Both questions are interesting to explore, but given the data, this one was easier to answer.

COVID-19 School Closures Worldwide



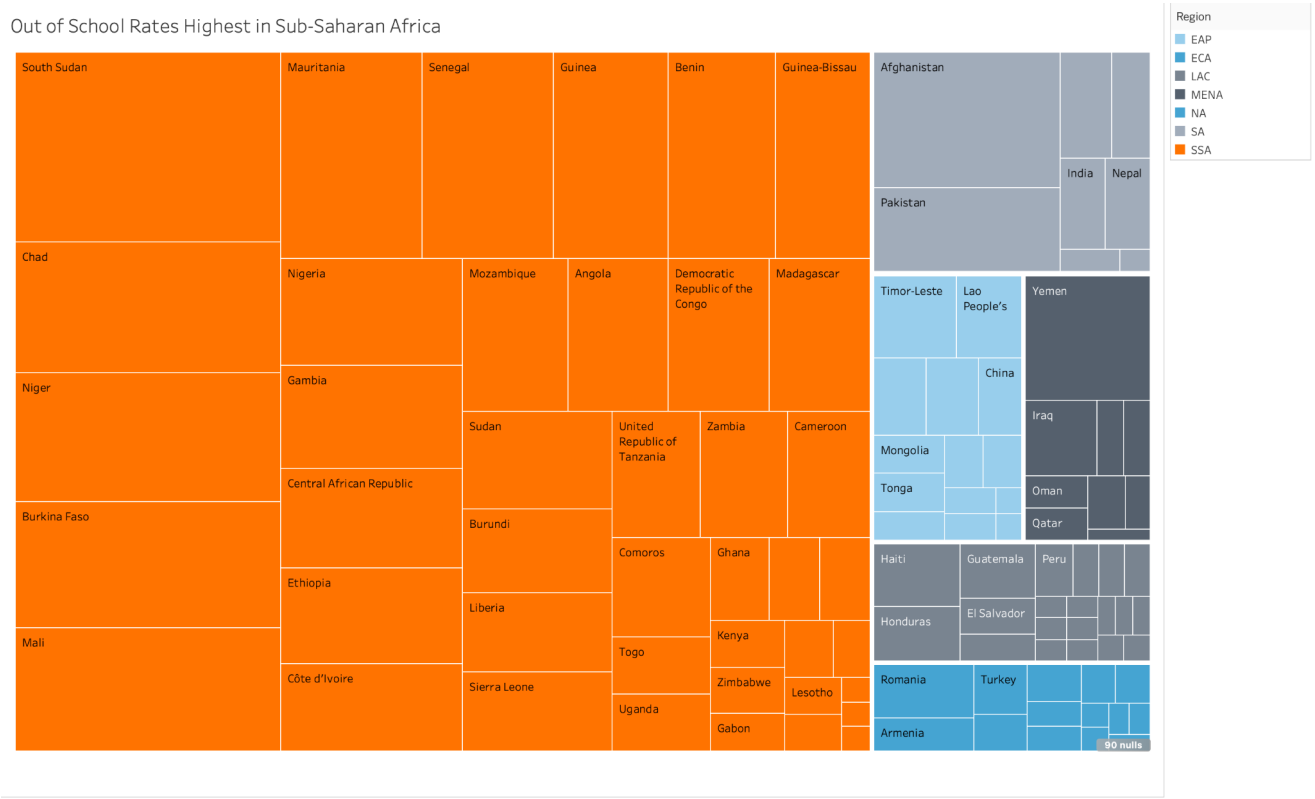
The following visualization most directly addresses the second question that our team formulated: "Which countries/regions were most affected by the pandemic in terms of education outcomes?" The visualization I've created depicts the COVID-19 school closure status for countries across the globe, aligning with our initial inquiry. Through this map, we can see the disparities and similarities in closure statuses among different regions.

Moreover, this visualization offers valuable supplementary information by representing the number of enrolled students in each country, spanning from pre-primary to tertiary education, using the size of the circles. This additional layer of data provides insight into the scale of the impact on students resulting from these school closures. This visualization does not alter our original question but rather gives additional insight.

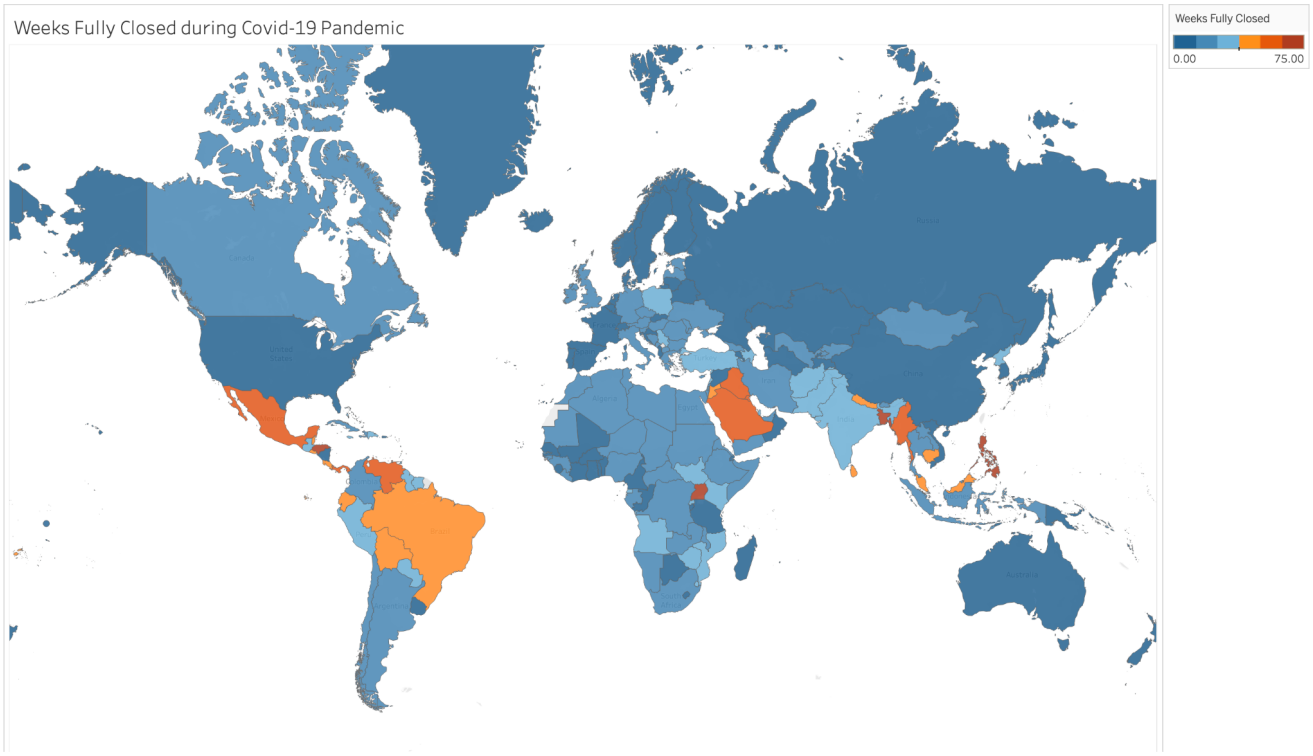


This final visualization directly addresses the question: "4) Does a student's socio-economic status affect their out-of-school rates?". The visualization presents out-of-school rates categorized by different wealth quintiles. It's important to note that while the wealth quintile is related to socioeconomic status (SES), SES is a more comprehensive measure encompassing various socioeconomic factors such as income, education, and occupation. The wealth quintile primarily focuses on the economic aspect of SES. Given that our dataset lacks a direct measure of socioeconomic status, the wealth quintile serves as the nearest available proxy for visualizing these effects. The visualization further highlights variations in out-of-school rates for children across different quintiles in six global regions, allowing us to not only discern overarching trends in out-of-school rates relative to wealth quintiles but also to explore regional differences in these outcomes.

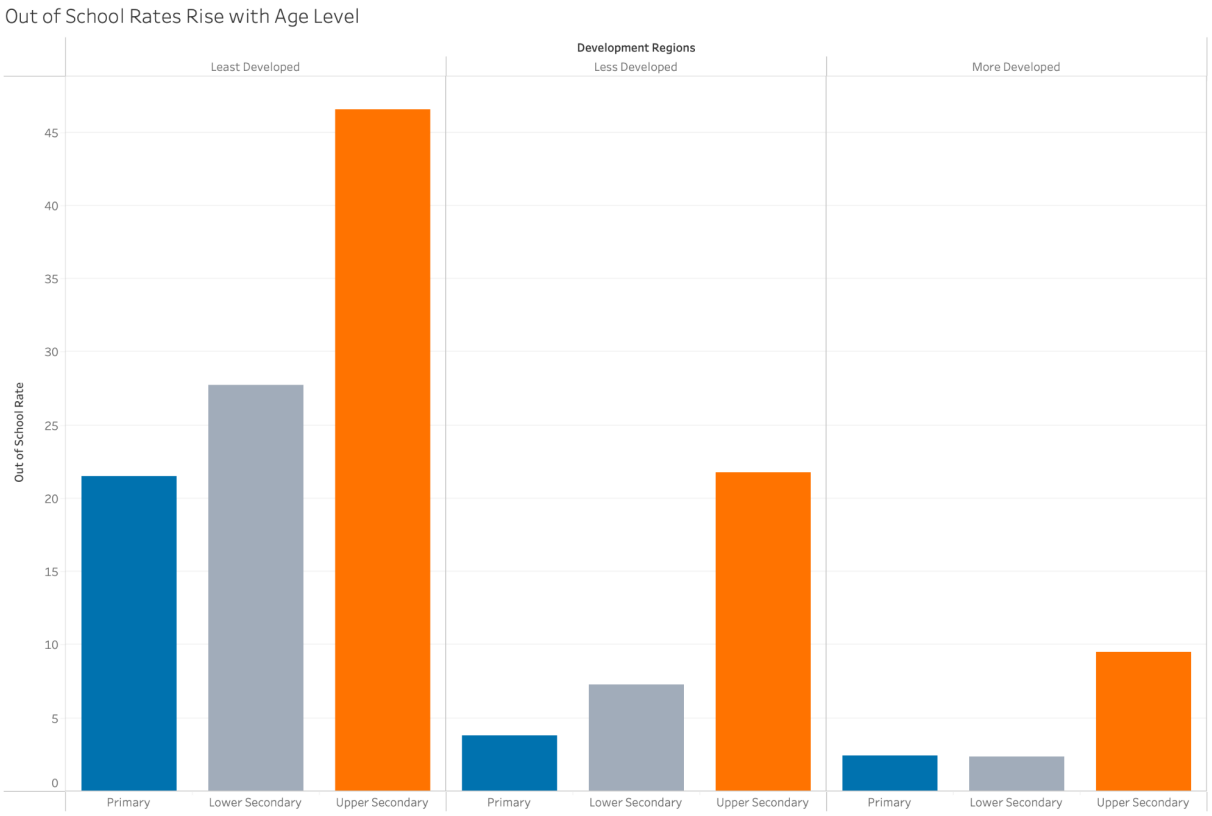
Sydney:



This visualization began as a way to answer the question: "1) What countries have the highest out-of-school rates?" However, as I was making the visualization I noticed that the countries with the highest out-of-school rates were predominantly in Sub-Saharan Africa. The final visualization more closely answers the question: "What regions have the highest out-of-school rates?" I believe that the second question is a better one because policies addressing out-of-school rates could investigate why it is that Sub-Saharan Africa as a region has higher out-of-school rates. Thus, there could be broader interventions created on a regional level to have a greater impact in improving out-of-school rates.



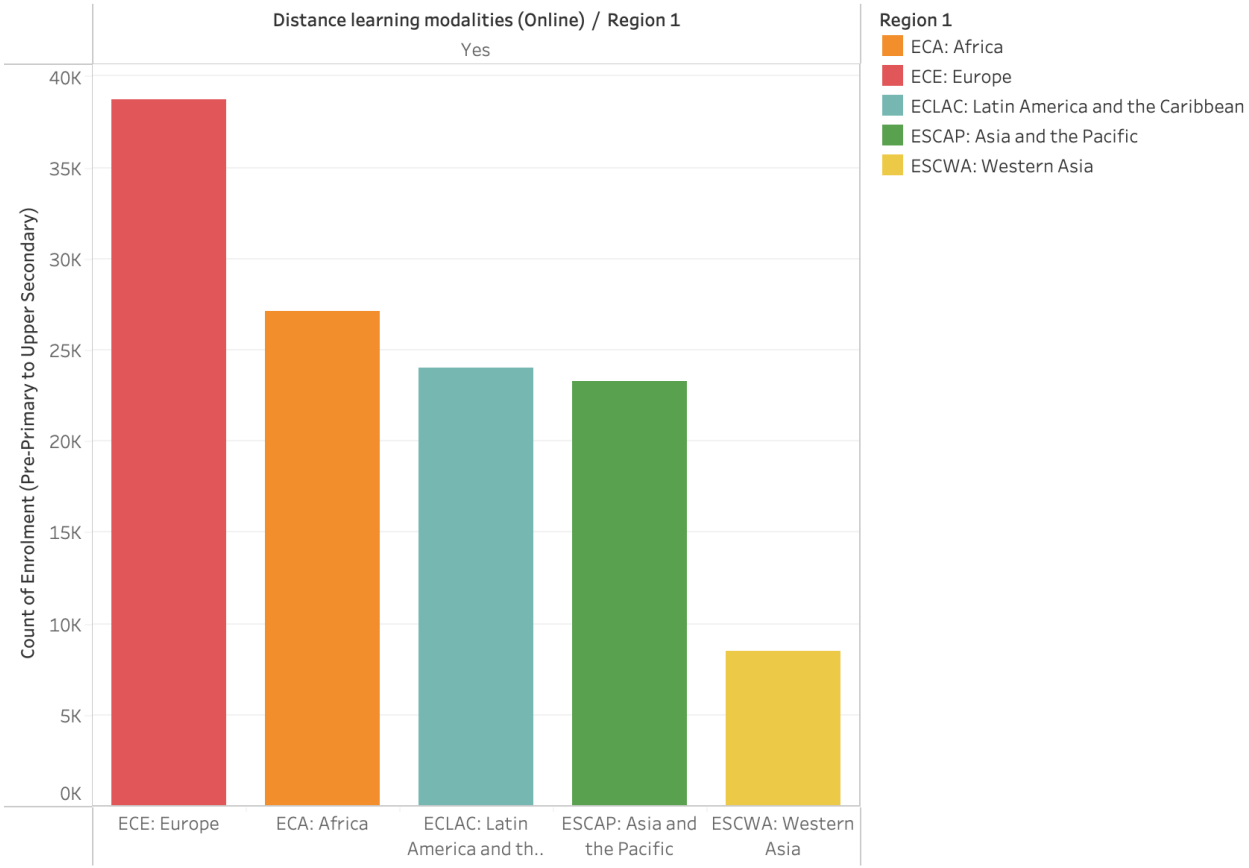
This visualization answers the question: “8) How did the number of weeks a school was closed during the pandemic vary by country and region?” The countries with the highest number of weeks closed during the pandemic did not seem to have a regional pattern so I used a global map (and the color orange) to highlight the specific countries with the longest school closures. Here, I stuck with the original question that our team came up with because it is important to understand which countries had the longest closures during the pandemic because these school closures can have significant effects on students’ educational outcomes.



This visualization answers the questions: “How do out-of-school rates change as a student gets older? Is this trend consistent across countries with different development levels?” While making this visualization, I was inspired by the team’s original question: “4) Does a student's socio-economic status affect their out-of-school rates?” However, instead of looking at income on a student level, I decided to focus on a country-level analysis. This visualization provides insights that as a student gets older (or the school level increases), out-of-school rates also rise. Further, this trend is common across countries with varying development levels. We can also see that, as we would expect, out-of-school rates are higher for the least developed countries.

Aida:

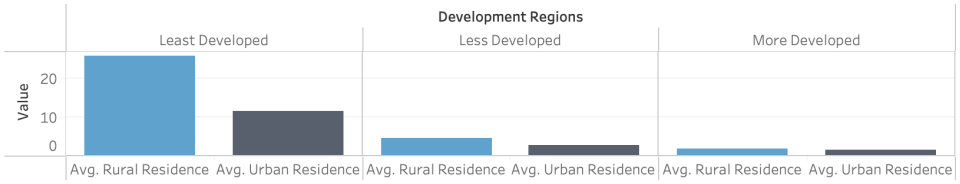
The number of school enrollment was highest in Europe with online learning.



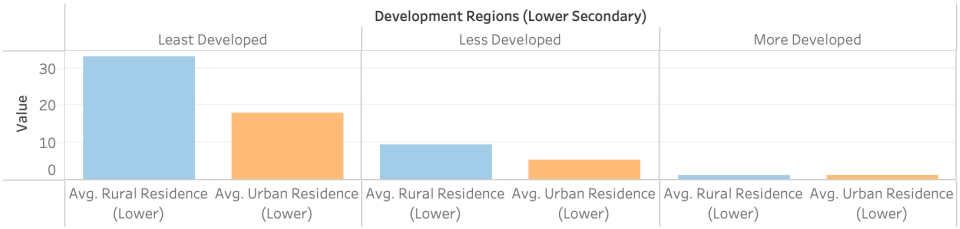
The visualization addresses the question of how enrollment compares in different regions by the modality of online learning. Our initial question was broader than this and wanted to have an overlook of all learning modalities. However, I thought it would be beneficial to look at solely online learning as that is the most common learning modality during COVID across the globe. I do think our team's question is better as it looks at the global scope but this is also an interesting initial visual to get us started thinking about the trends we might expect in this part of our analysis.

Rural Residences have higher out of school rates across educational level up to 12th grade

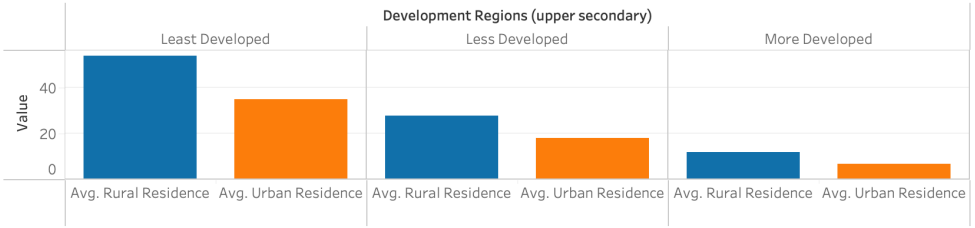
Out-of-school rates (primary) by residence types



Out-of-school rates (lower secondary) by residence types

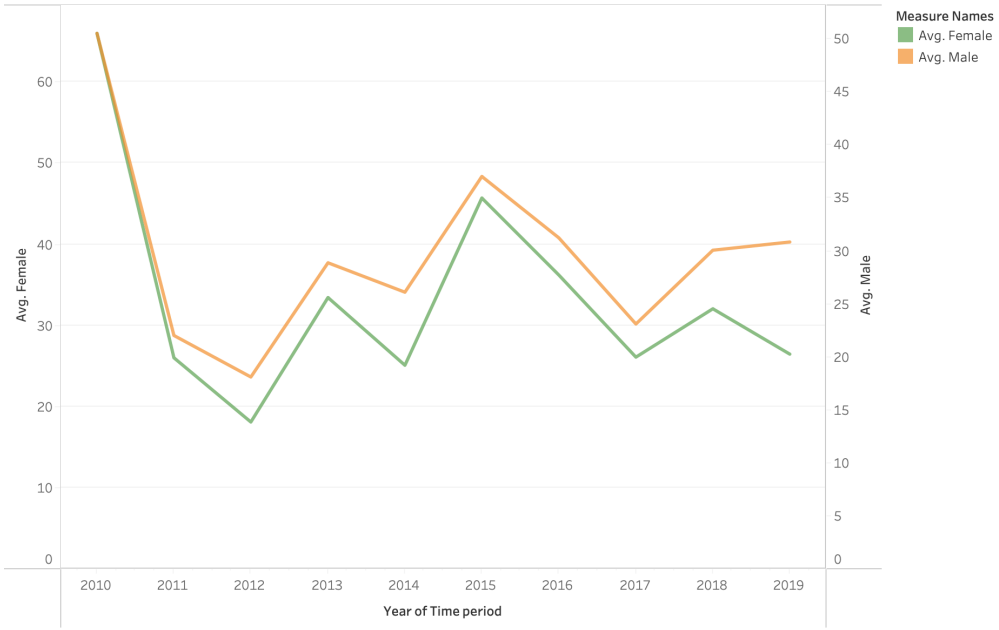


Out-of-school rates (upper secondary) by residence types



These graphs provide preliminary information about the impact of residency, whether urban or rural, on out-of-school rates around different World Bank regions. It is most closely answering question 5) Does living in a rural area lead to higher out-of-school numbers than those in the urban areas? The trends seem to say yes, across regions. However, the most interesting aspect is that the rates are higher in the least developed regions and upper secondary schools. I chose to stick with this question from the team because it is important to understand the out-of-school rates trends through different lenses initially before diving into particular aspects of the topic.

Out-of-school rates were declining for both genders in upper secondary.



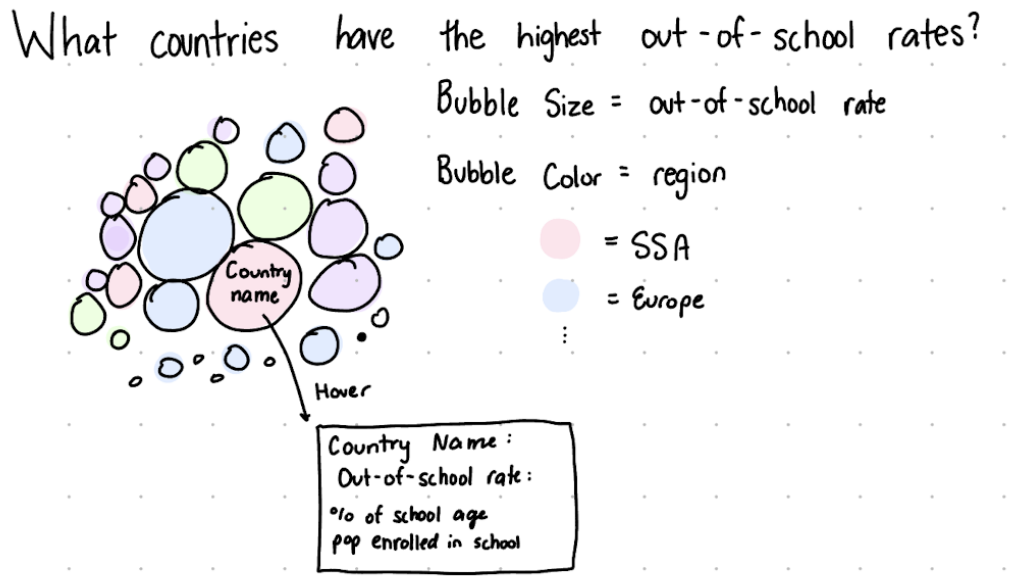
The trends of Avg. Female and Avg. Male for Time period Year. Color shows details about Avg. Female and Avg. Male. The view is filtered on Time period Year, which keeps non-Null values only.

This visualization helps to respond to the question of how average out-of-school rates vary by gender in upper secondary. Even though this question was not exactly asked by our team, I thought it was interesting to look at a very specific subgroup of the student population and compare them. We can observe that both genders follow similar trends but it is quite notable the decline in female out-of-school rates between 2018 and 2019. However, male average out-of-school rates seem to plateau or even slightly increase. It will be interesting to research more about this idea if this trend appears for all subgroups and observe the impact of COVID-19 on this improvement globally. Our team question focused across the entire population which is probably more inclusive but I wanted to have a detailed view as well.

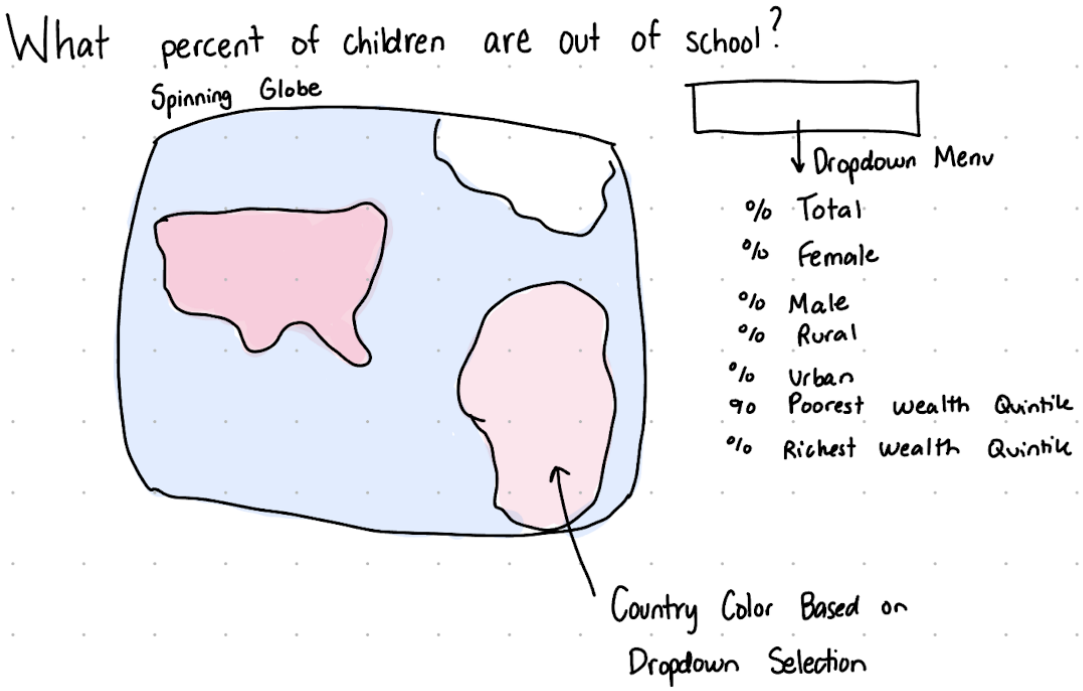
Week 10: Data, Sketches, Decide & Storyboard

Sketch Step
Sydney's Sketches:

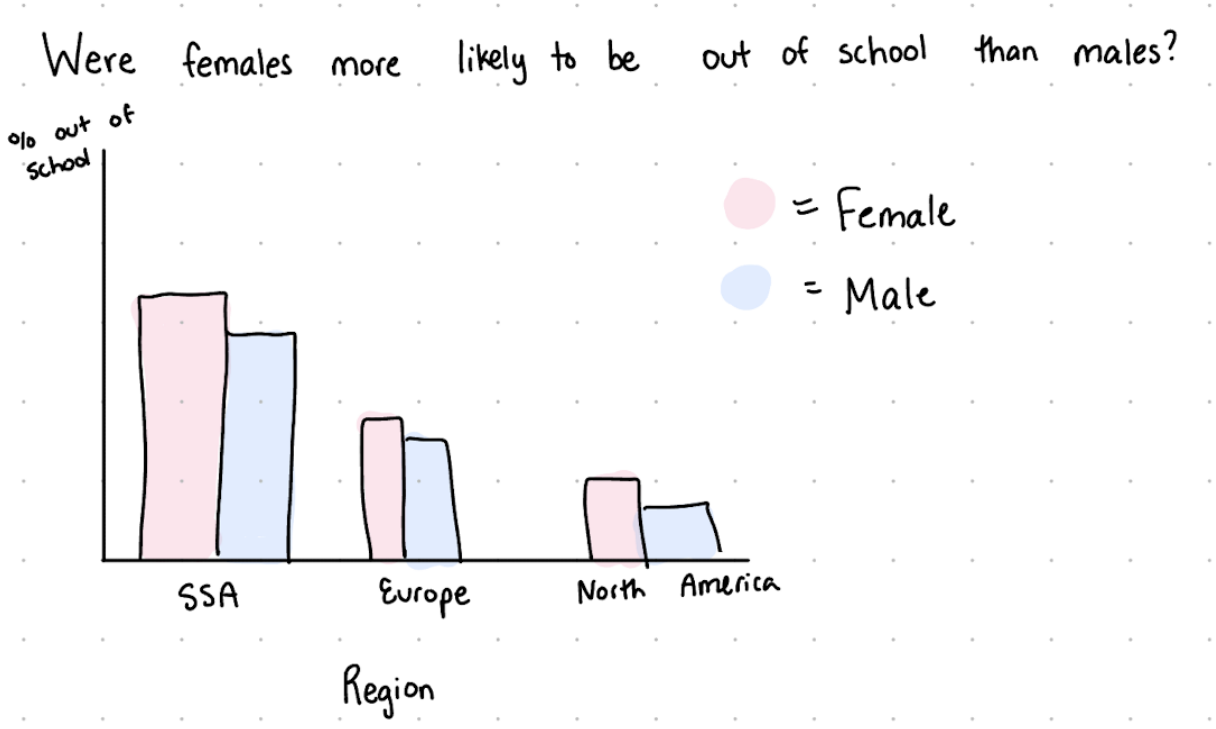
Sketch ID 1



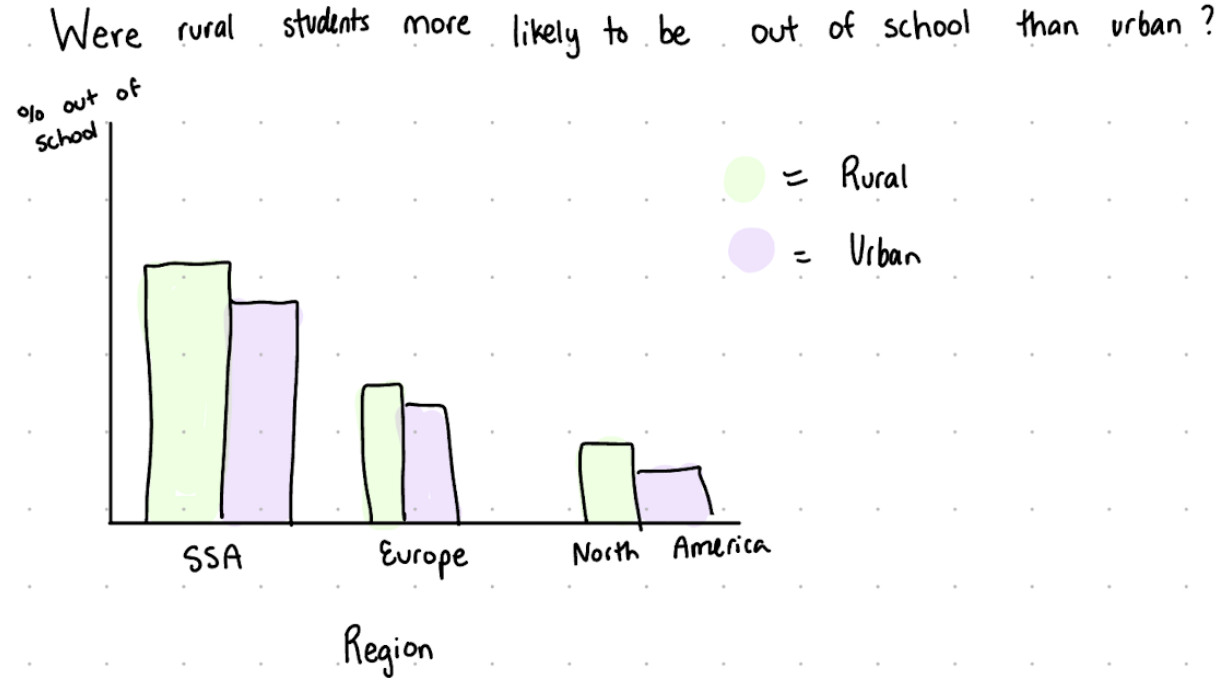
Sketch ID 2



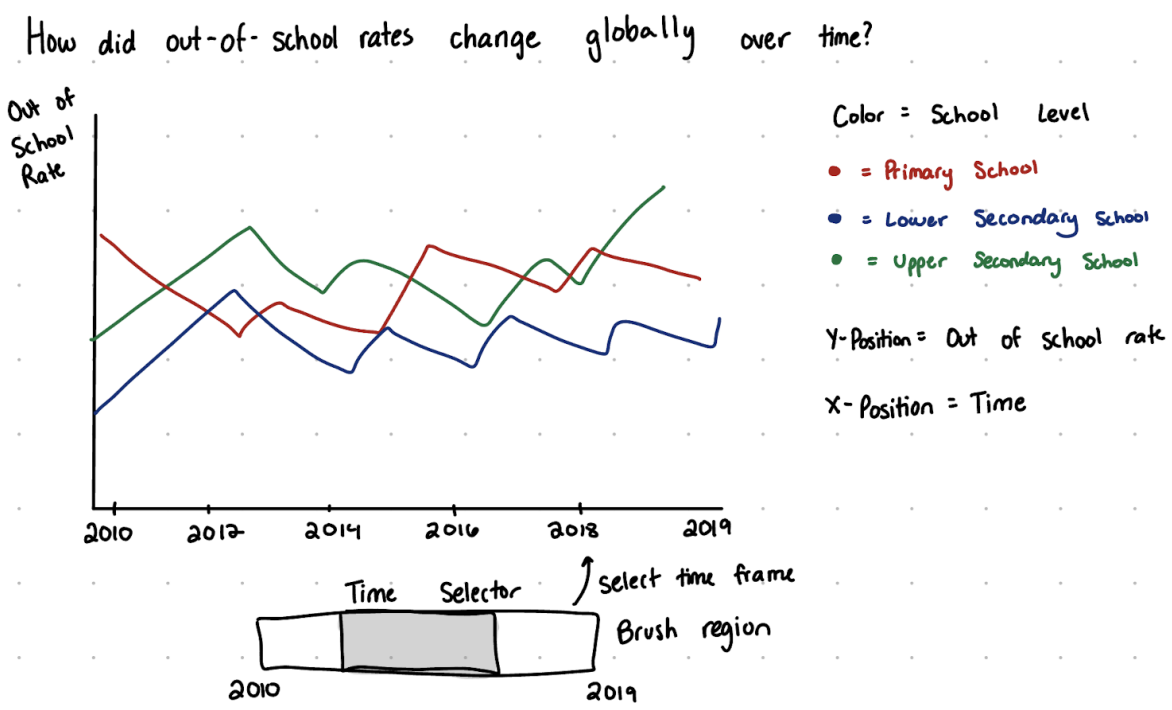
Sketch ID 3



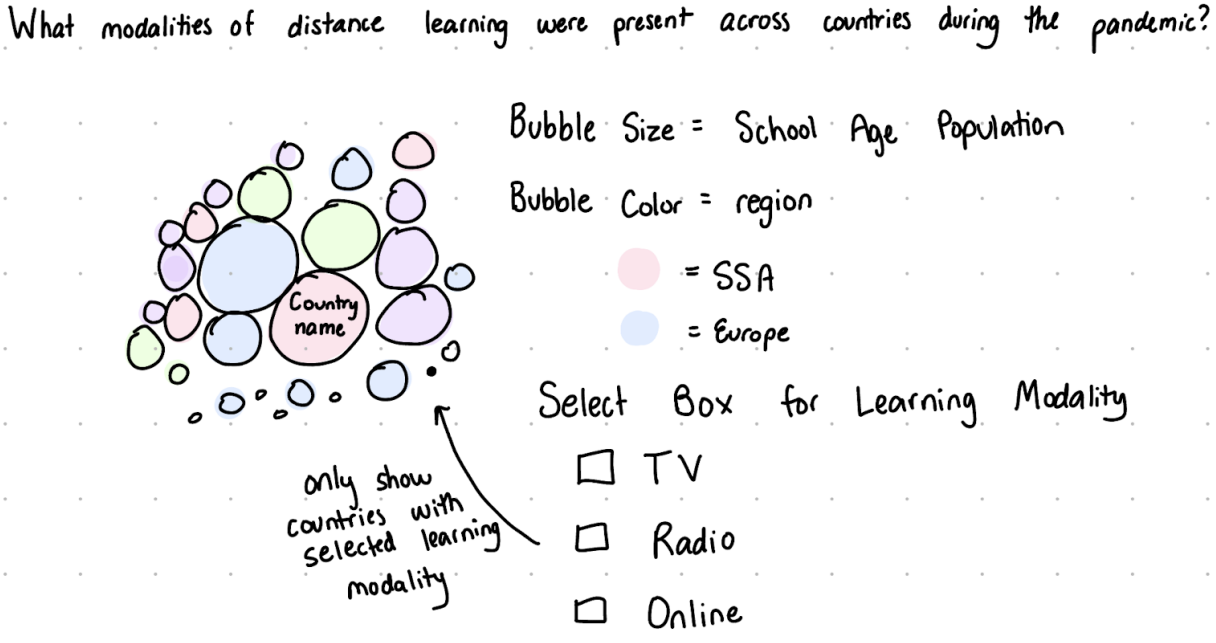
Sketch ID 4



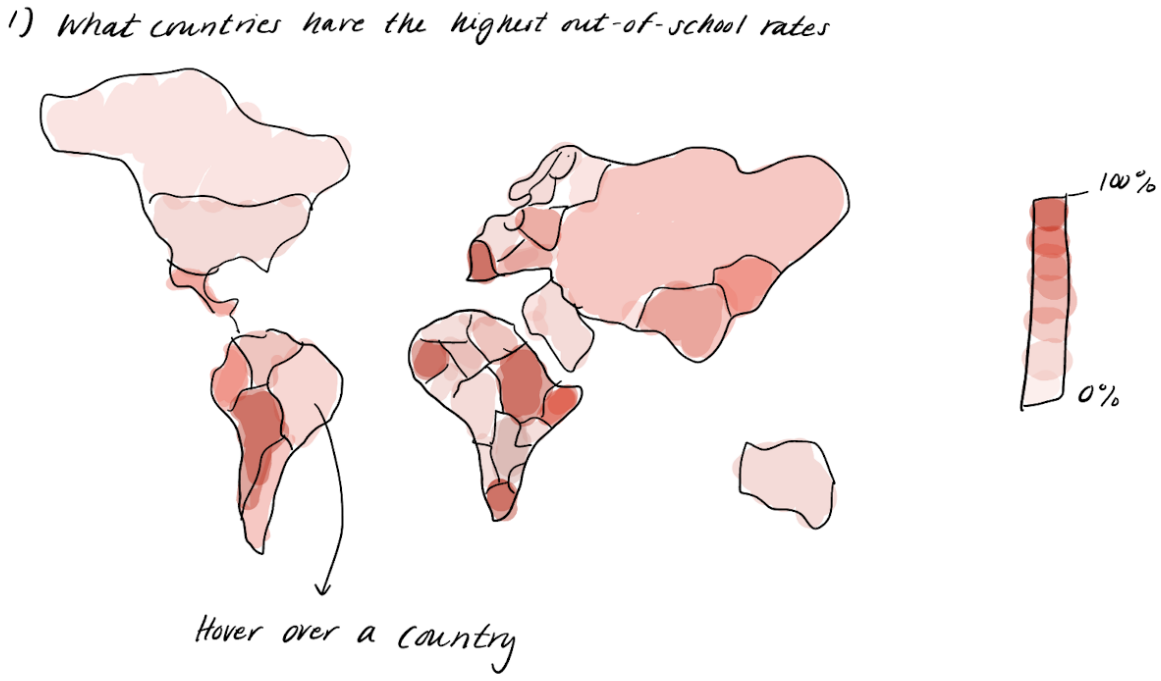
Sketch ID 5

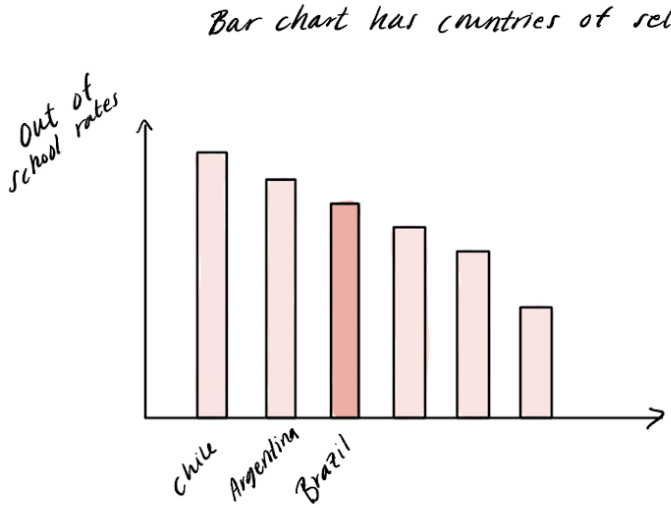


Sketch ID 6

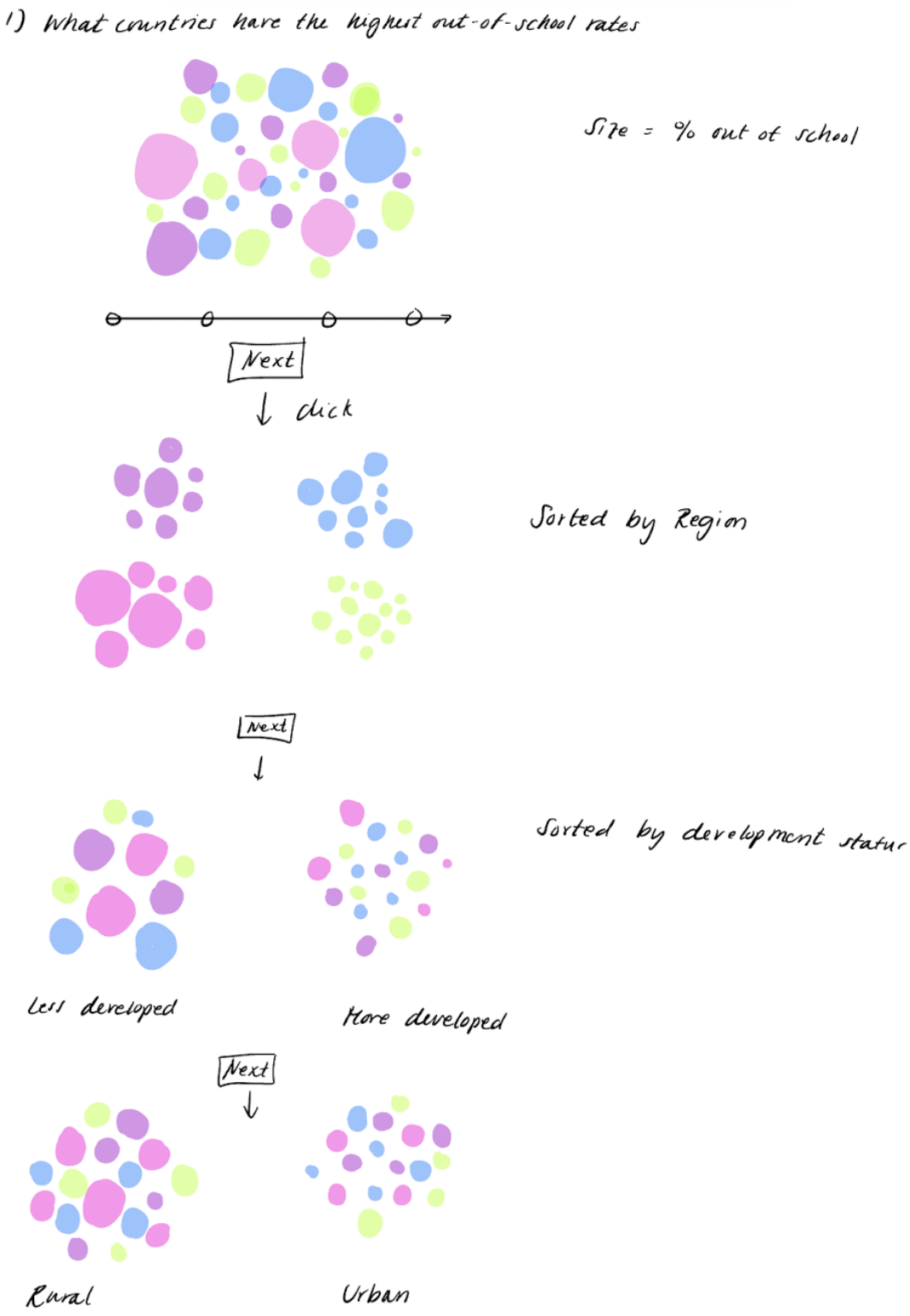


Niki's Sketches:
Sketch ID 7



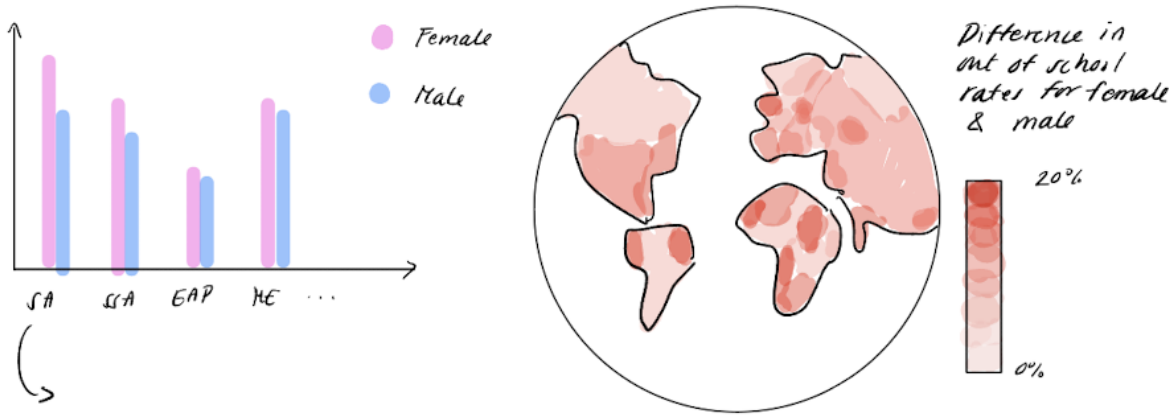


Sketch ID 8


1) What countries have the highest out-of-school rates
Size = % out of school
Next
click
Sorted by Region
Next
Sorted by development status
Less developed
More developed
Next
Rural
Urban

Sketch ID 9

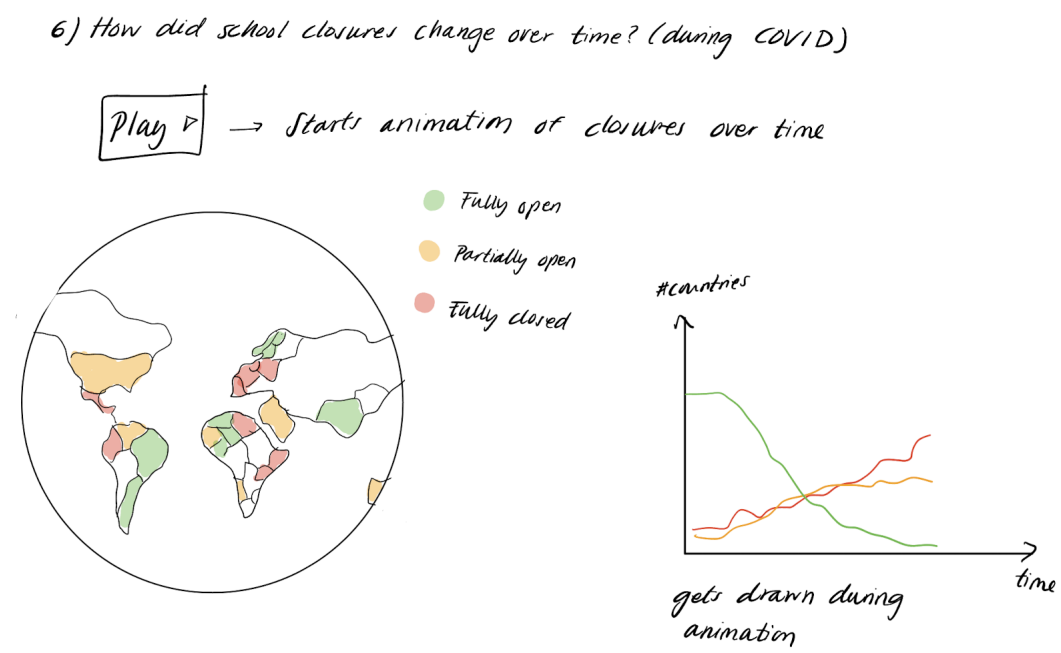
3) Were females more likely to be out of school than males? Does this effect vary by country?



click on regim to see difference between male & female for that regim

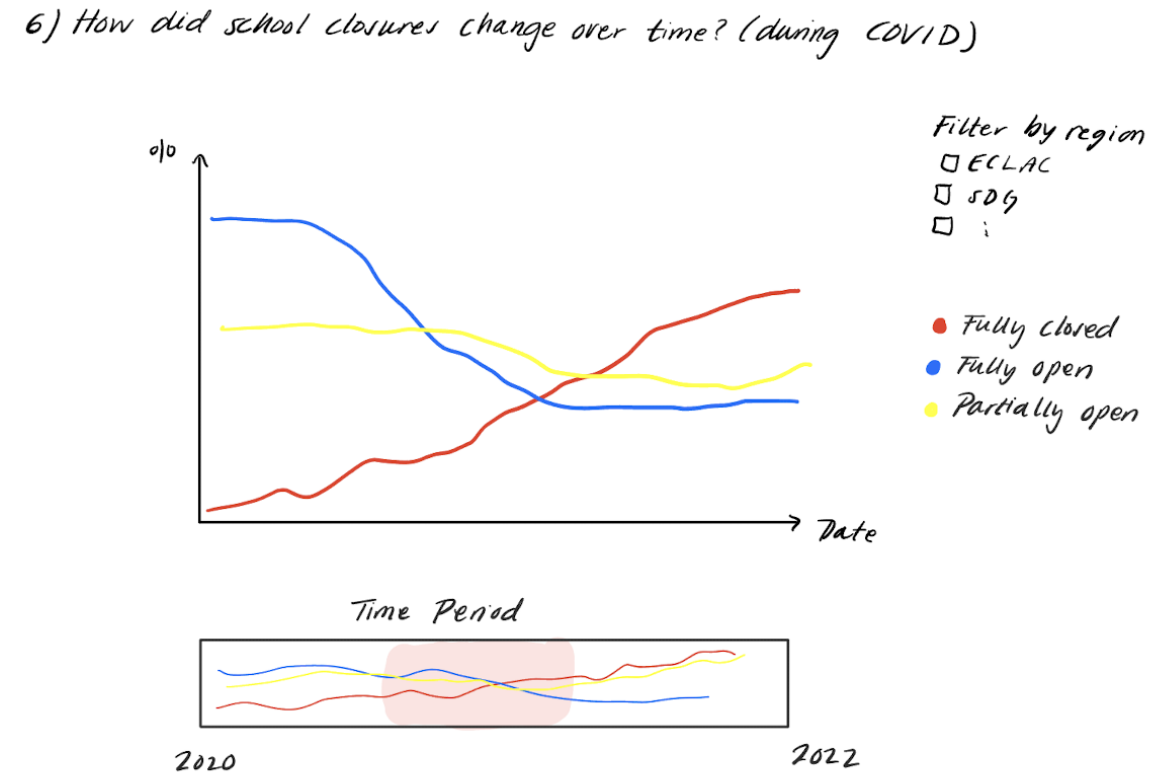
Asia

Sketch ID 10



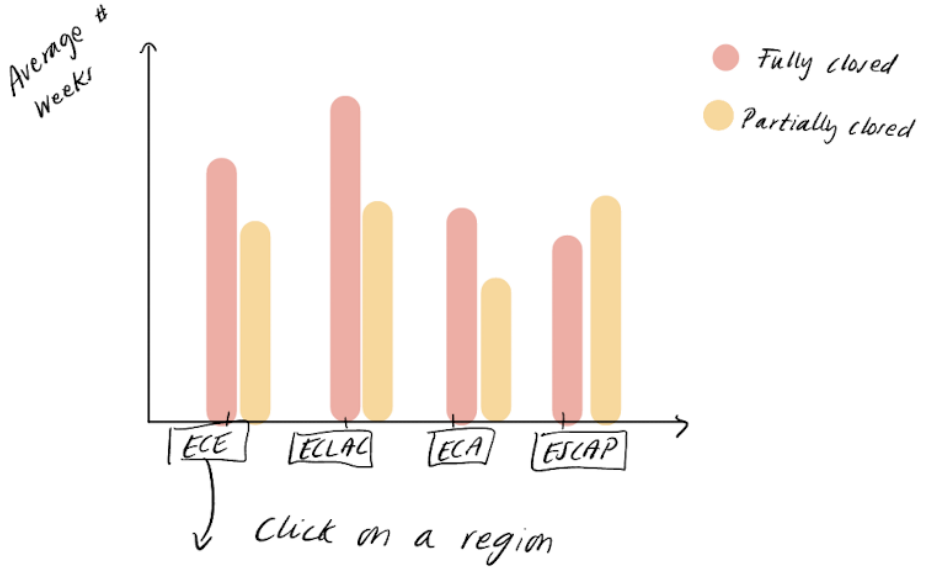
Date: May 15 2021 ← this updates with animation

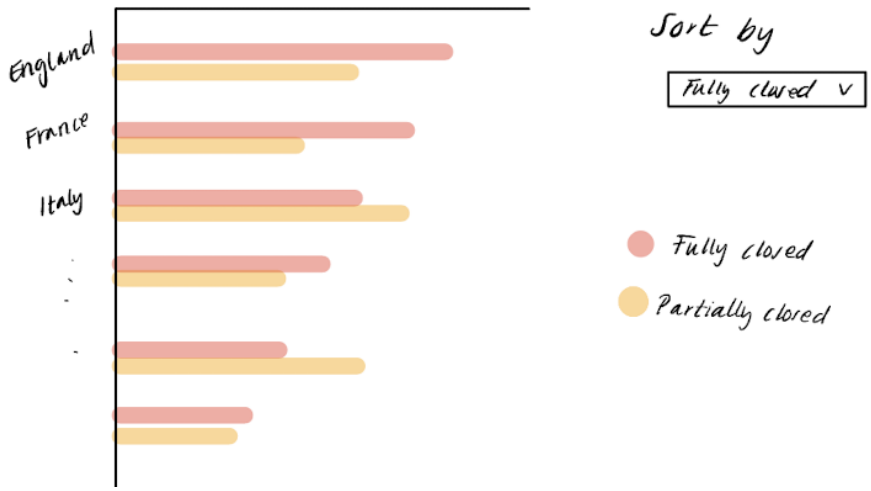
Sketch ID 11


6) How did school closures change over time? (during COVID)
o/o
Date
Filter by region
ECLAC
SDG
i
Fully closed
Fully open
Partially open
Time Period
2020
2022

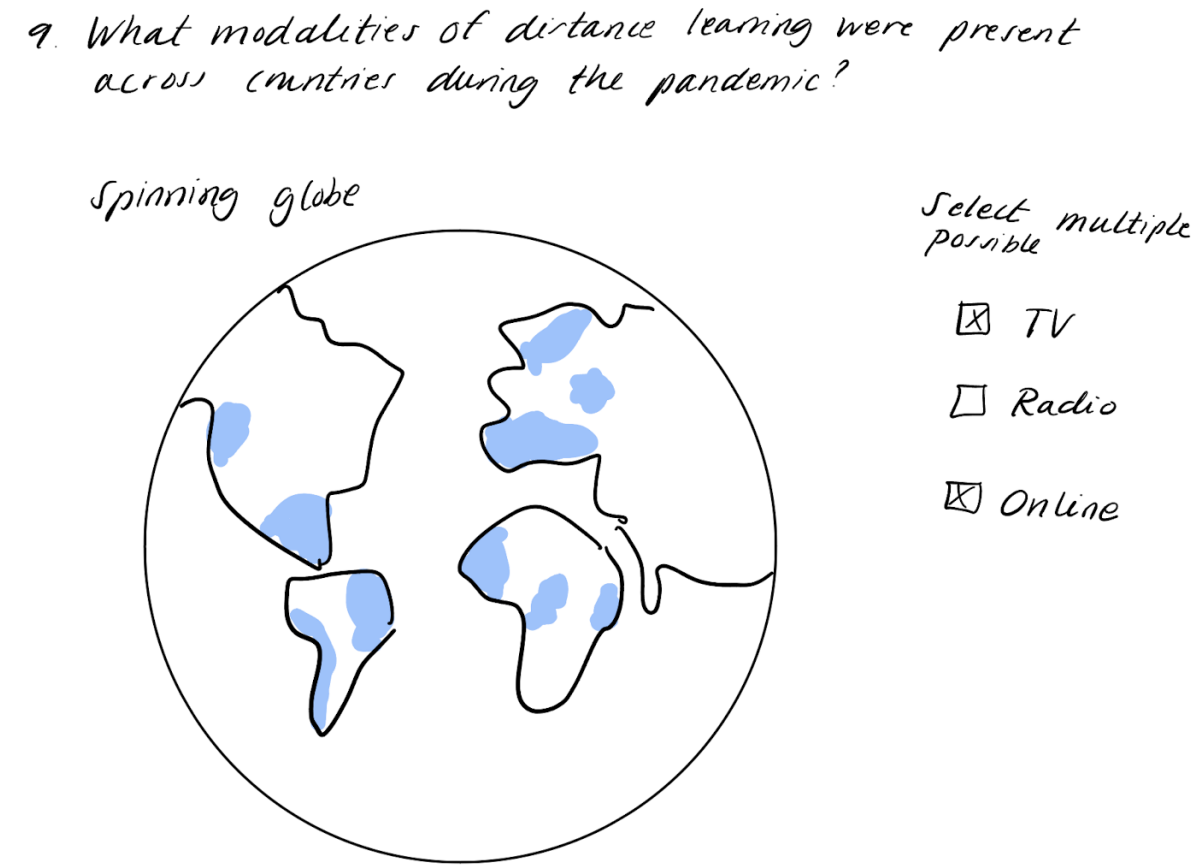
Sketch ID 12

8) How did the number of weeks a school was closed during the pandemic vary by country and region

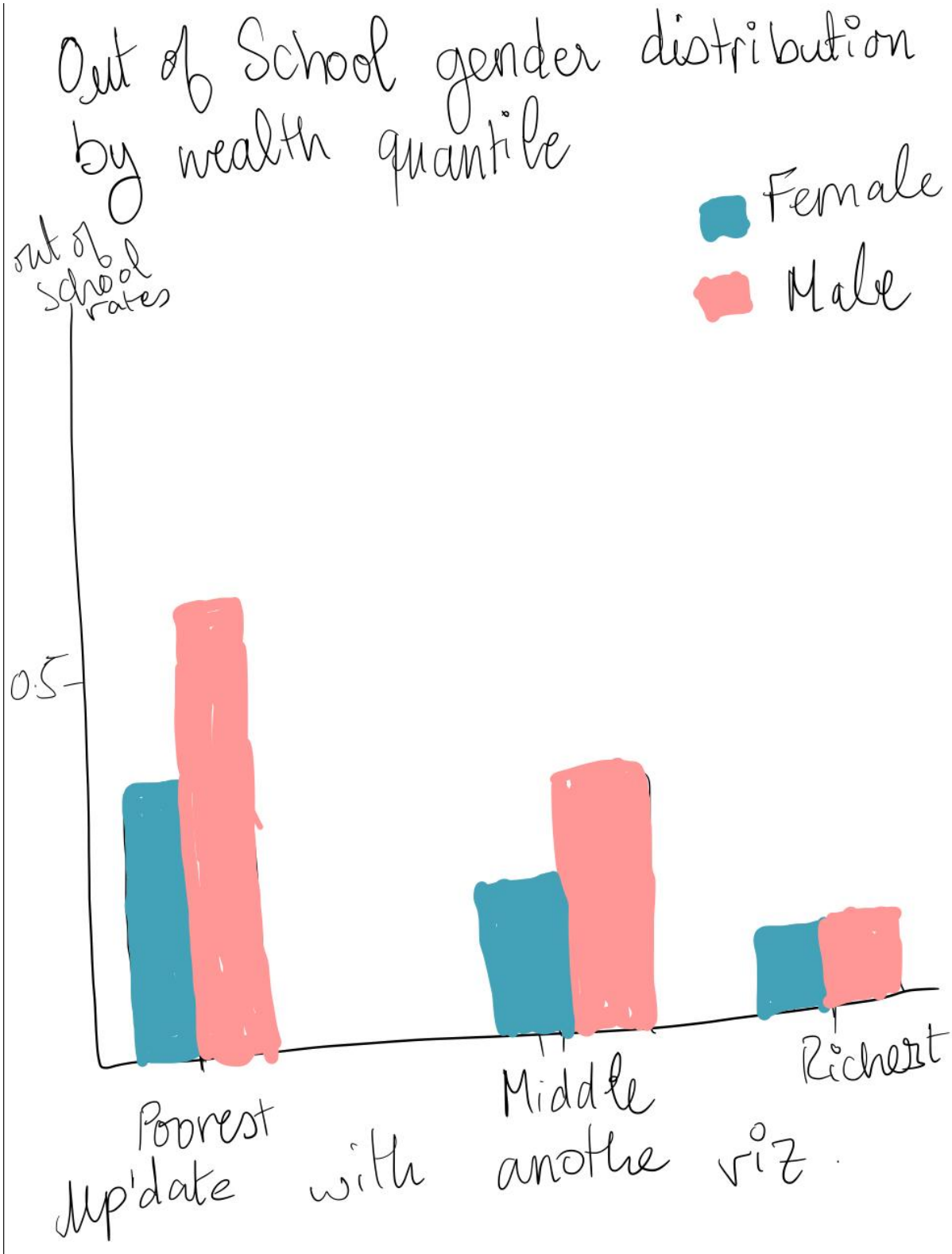




Sketch ID 13



Aida's Sketches:
Sketch ID 14

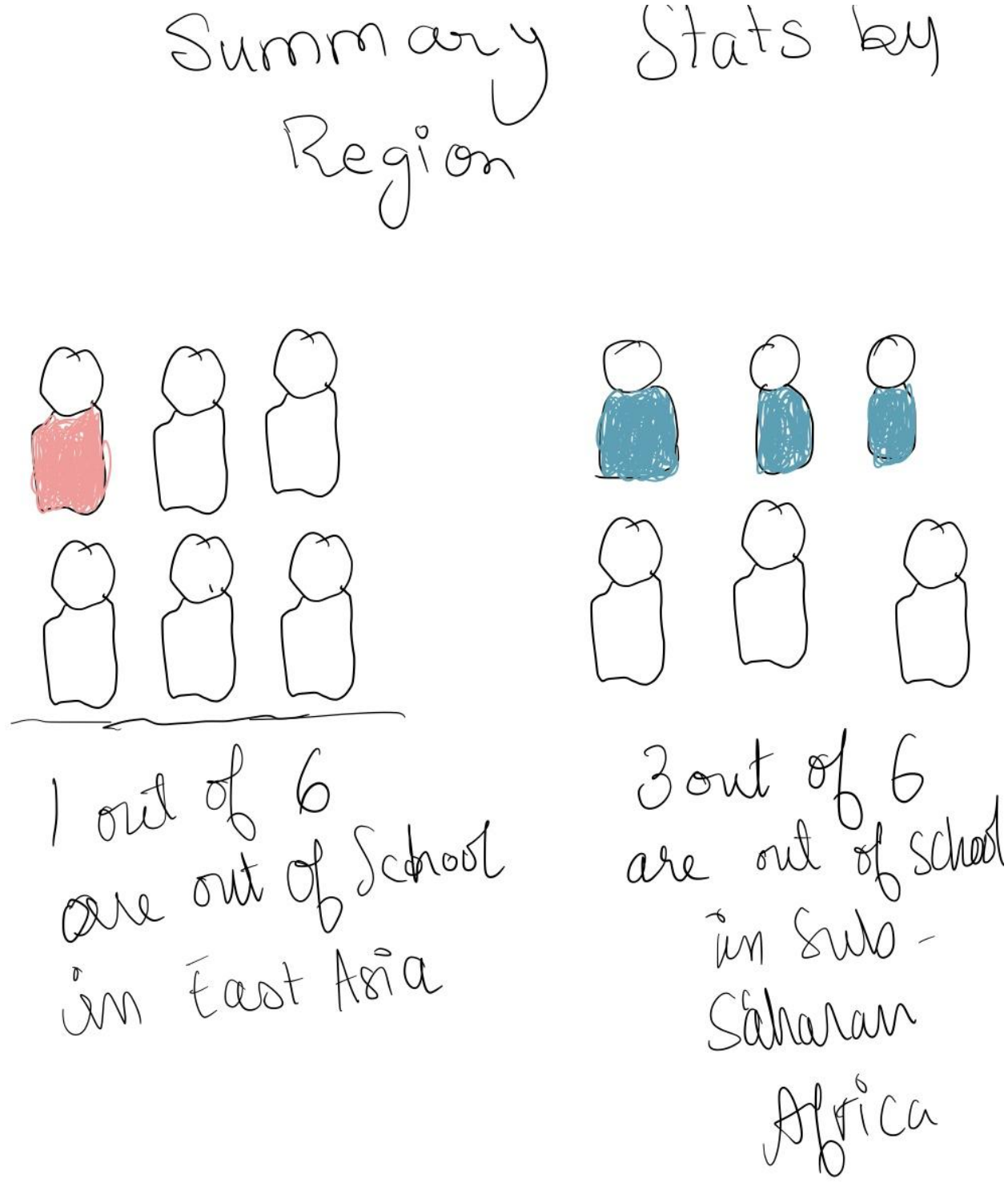


Up'date with anothe viz.

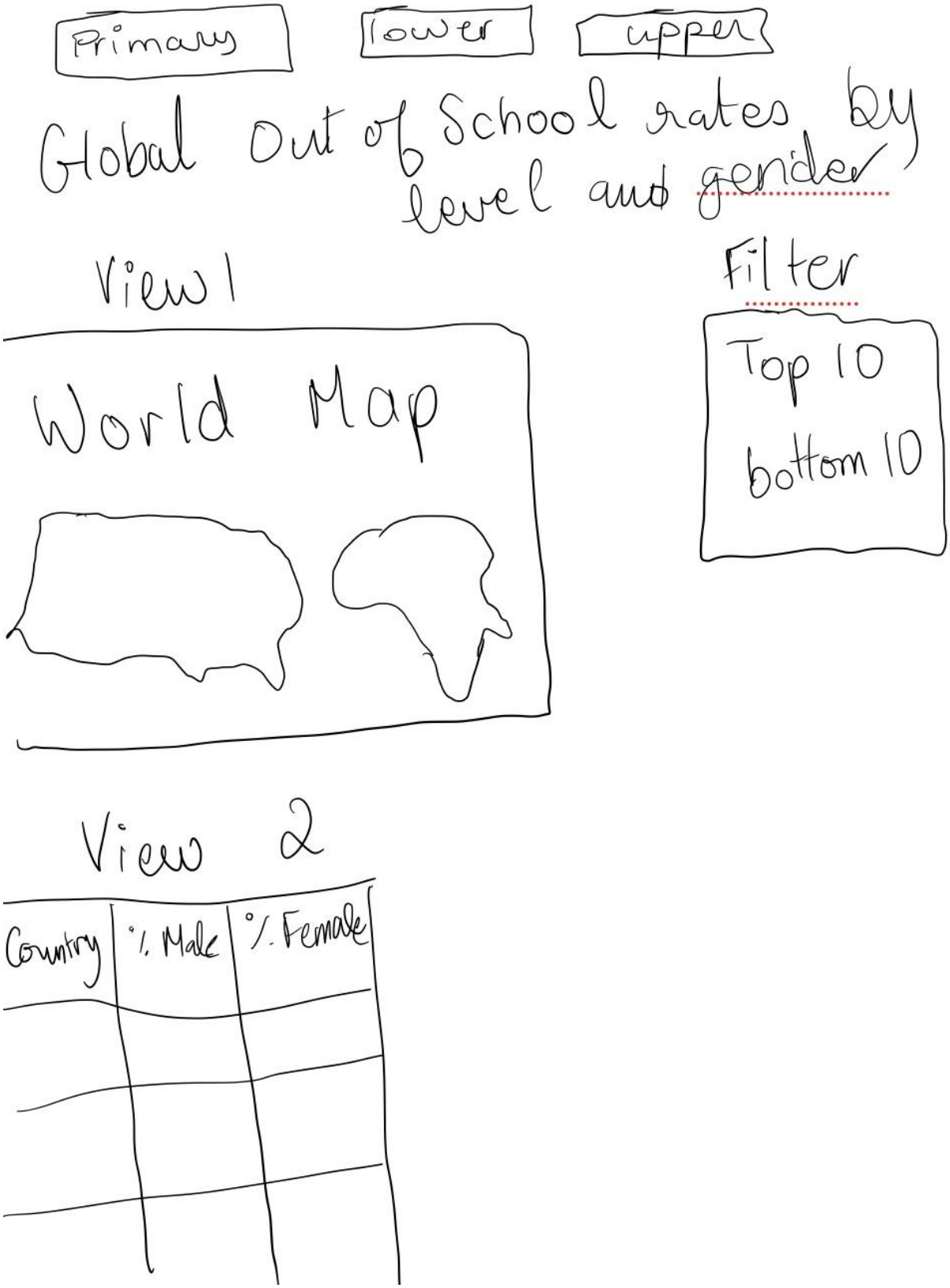
Sketch ID 15


Number of weeks closed by country
# of weeks closed
# of weeks partially open
Country name
Region 1
Region 2

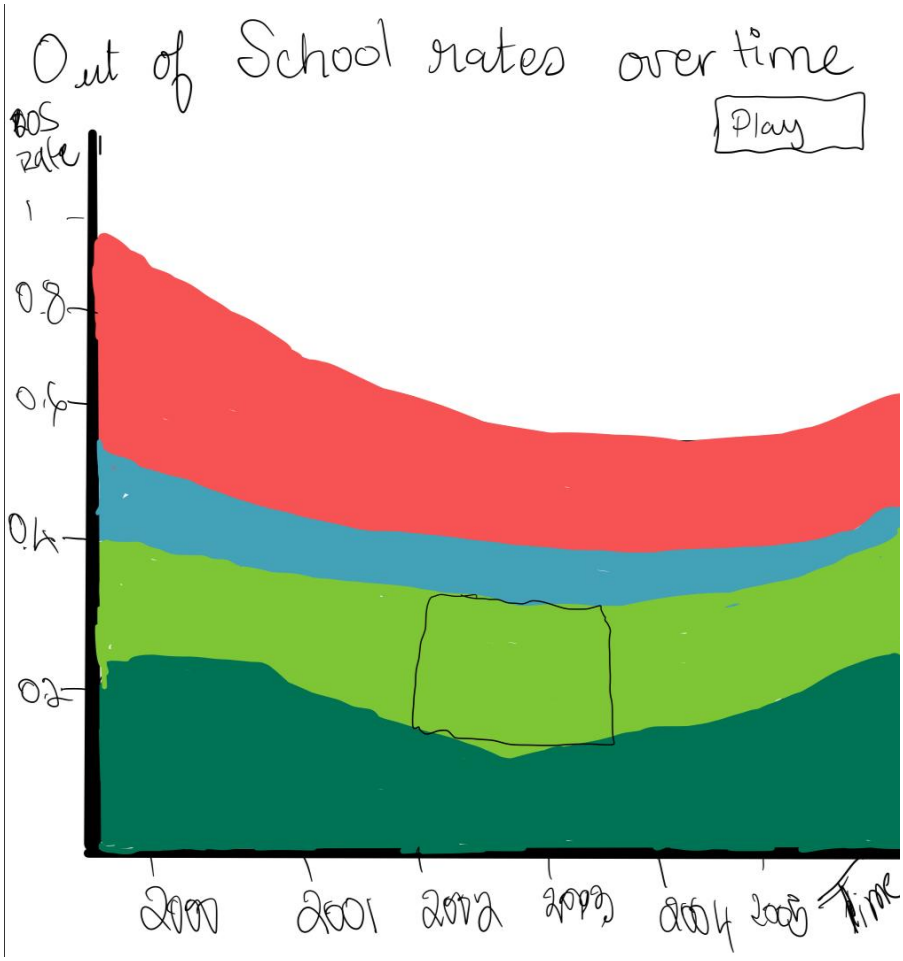
Sketch ID 16


Summary Stats by Region
1 out of 6 are out of School in East Asia
3 out of 6 are out of school in Sub-Saharan Africa

Sketch ID 17


Primary
lower
upper
Global Out of School rates by level and gender
View 1
World Map
Filter
Top 10
bottom 10
View 2
Country
% Male
% Female

Sketch ID 18



Decide Step

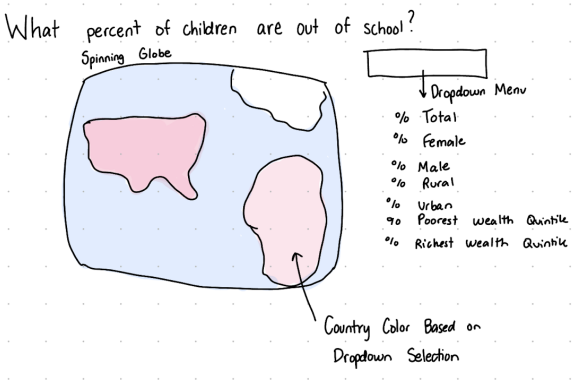
Sketch ID	Question ID	Author	Number of Votes
2, 9, 13, 17	1, 3, 5	Niki, Sydney, Aida	Sketch 2: 2 Sketch 9: 2 Sketch 13: 0 Sketch 17: 0
1, 8	1, 5	Niki, Sydney	Sketch 1: 3 Sketch 8: 2
16	10	Aida	Sketch 16: 3
10, 11, 18	6	Niki, Aida	Sketch 10: 2 Sketch 11: 0
3	3	Sydney	Sketch 3: 1
4	5	Sydney	0

5, 7	1	Sydney, Niki	0
6	9	Sydney	0
12, 15	8	Niki, Aida	0
14	3, 4	Aida	0

Final Sketches

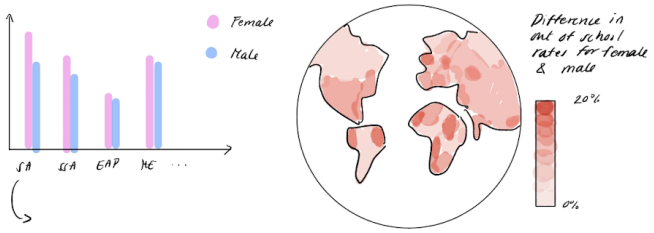
Sketch ID	Question ID	Author
Spinning Globe with Bar Charts (2, 9, 13)	1, 3, 5	Niki, Sydney, Aida
Bubble Plot (1, 8)	1, 5	Niki, Sydney
Icon Plot (16)	10	Aida
Line Chart (10, 11)	6	Niki

<u>Spinning Globe with Bar Charts</u>
Sketch ID: 2

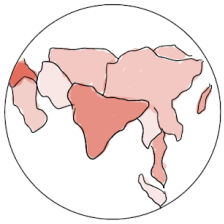


Sketch ID: 9

3) Were females more likely to be out of school than males? Does this effect vary by country?



click on regim to see difference between male & female for that regim



Asia

Sketch ID: 13

9. What modalities of distance learning were present across countries during the pandemic?

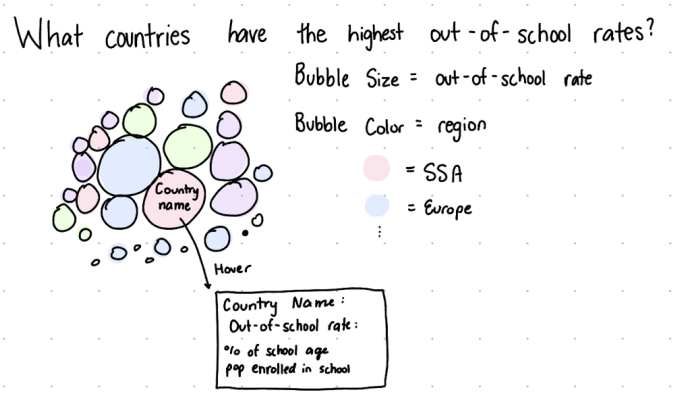
Spinning globe

Select multiple possible

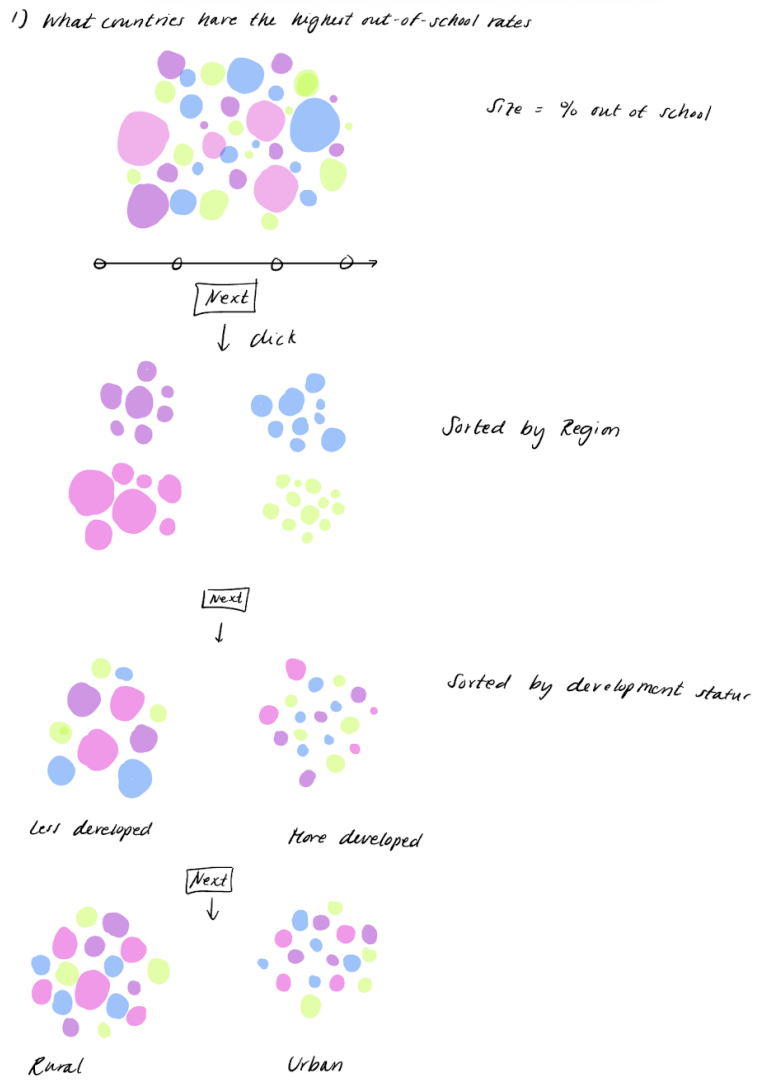
- [x] TV
- [ ] Radio
- [x] Online

Bubble Plot

Sketch ID: 1

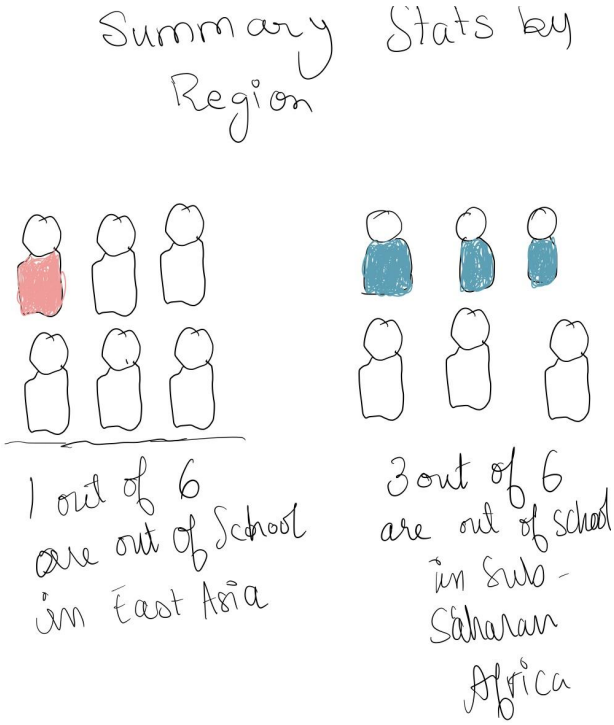


Sketch ID: 8



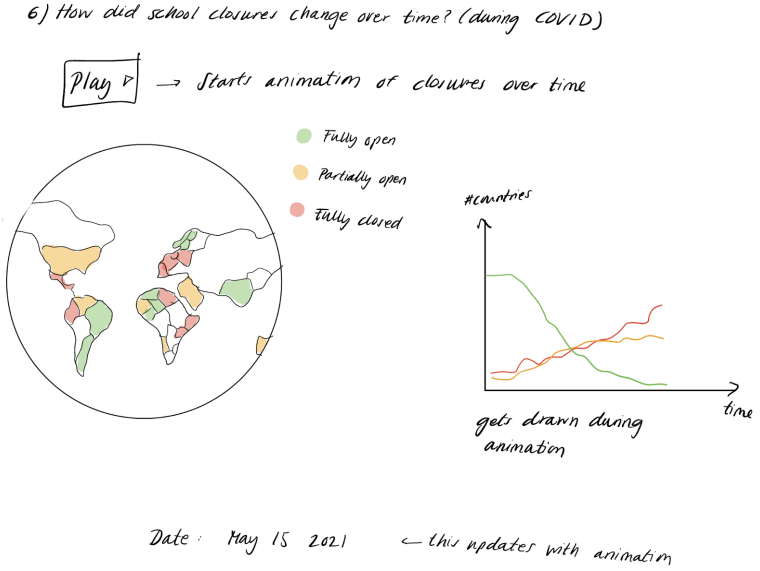
Icon Plot:

Sketch ID: 16

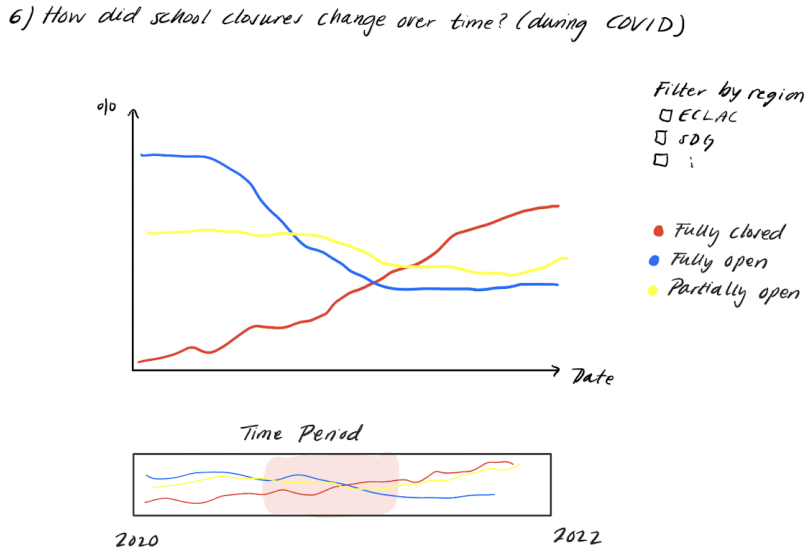


Line Charts:

Sketch ID: 10



Sketch ID: 11



Rationale

Our first visualization consists of a spinning globe that will allow the user to interact with the visual while highlighting comparisons between different countries in terms of their out of school rates and the impact of the pandemic. We chose this format because a globe will highlight the geographic differences in educational outcomes. Our next visual will be a bubble plot because we can use multiple markers to display the information, including the size and color of each bubble. The user will be able to sort the bubbles by region, development status, and urban vs. rural. Then, we will implement an icon plot because this format highlights to the viewer the human-impact this topic has beyond just numerical statistics. Finally, we will explore the impact of covid on educational outcomes over time by creating a line plot that displays a school's status throughout the pandemic.

Storyboarding

Insights:

Sydney:

- Out of school rates are significantly higher for countries in the Sub-Saharan Africa region compared to any other region
- Schools in Mexico were closed significantly longer than nearby countries such as the United States and Canada. Brazil was also another country closed significantly longer than its neighbors
- Out of school rates rise as school level increases. This means that as children get older, out of school rates increase. Further, this trend is consistent among countries of varying economic development levels.

- Countries who are less developed economically have higher out of school rates than countries who are more developed economically

Niki:

- In least developed countries, the out-of-school rates is much higher for females than males, in less developed countries the rates are about the same, but in more developed countries the rate is higher for males
- Rural areas have higher out-of-school rates than urban areas in every region of the world
- In every region of the world, the highest to lowest out-of-school rates follow the order of poorest to richest quintiles
- Countries in Sub-Saharan Africa has by far the highest out of school rates
- The number of countries with fully closed schools dramatically increased in March 2020 as the number of countries with fully open schools decreased

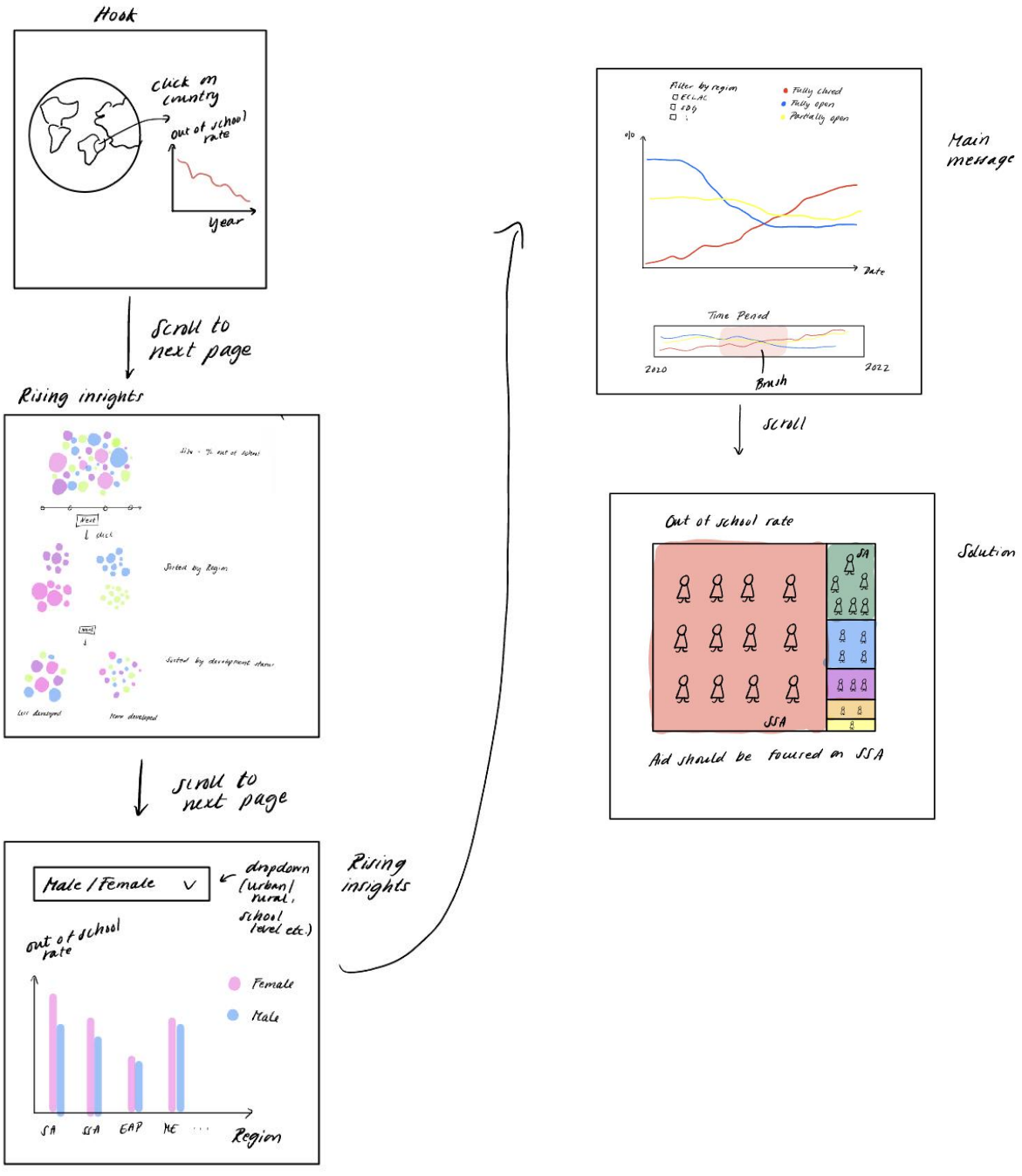
Aida:

- The number of enrolled students were highest in Europe with online learning.
- Rural residences have higher out-of-school rates across educational level
- Out-of school rates seemed to be on the decline for both genders in 2019, even though high and low fluctuations over the years.

Main message:

- Out of school rates have been declining overall over the past 20 years, but Covid-19 likely had an impact on these rates.
- We chose this message because we plan to explore both the impact of Covid-19 and pre-pandemic trends across region, gender, development status, and type of residence (urban vs. rural).

Sketch of Storyboard

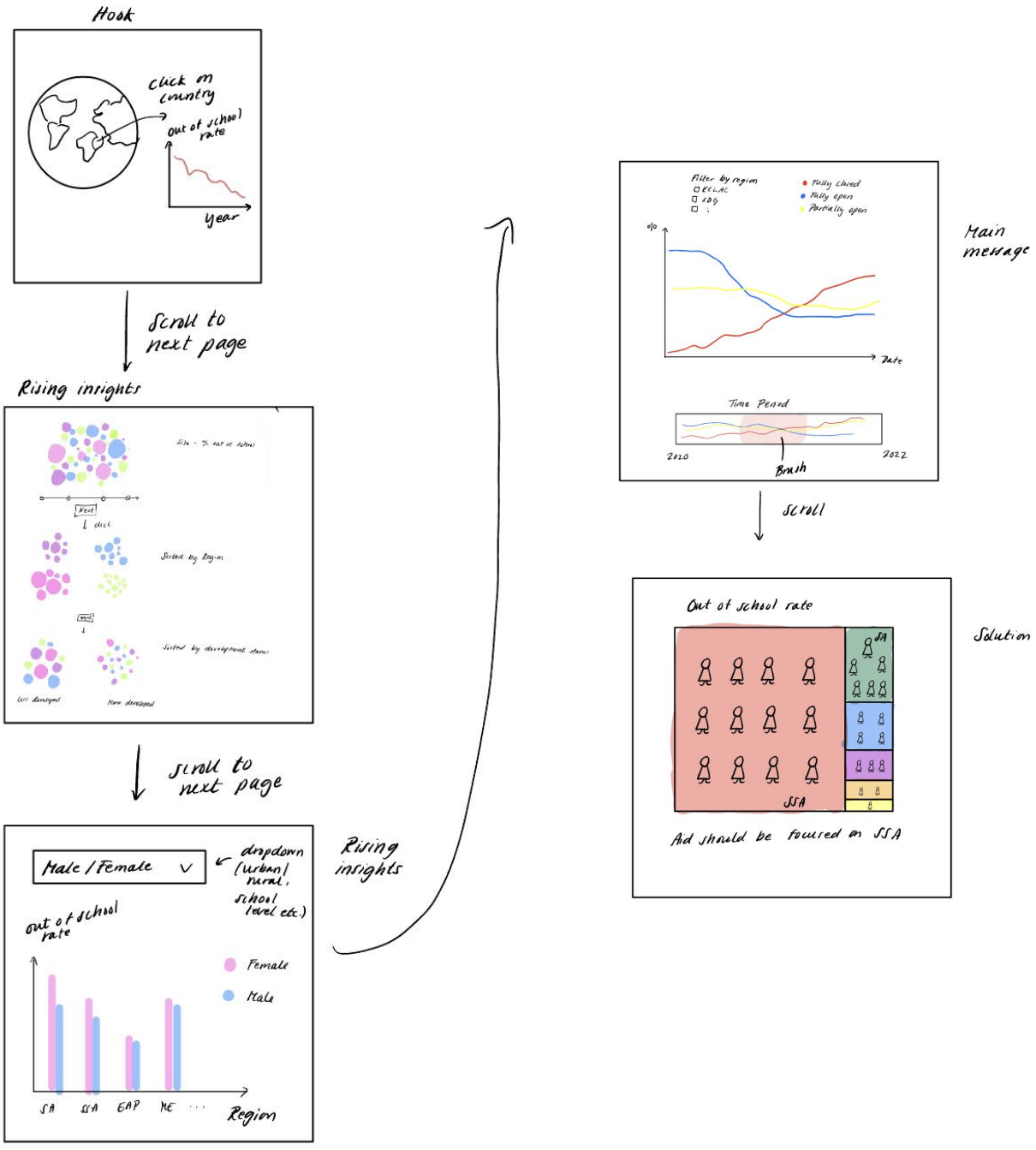


Next Steps

- Sydney
    - HTML with boilerplate and scrolling (put in Github main repo)
    - Bubble Plot & Sorting
- Aida
    - Hook plot (map & line plot)
- Niki
    - Time Period blush pot

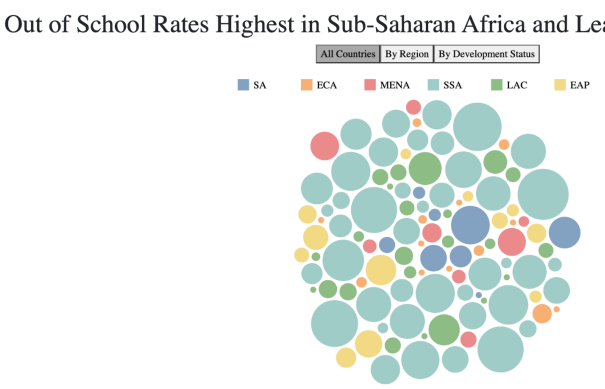
Week 11: Prototype V1

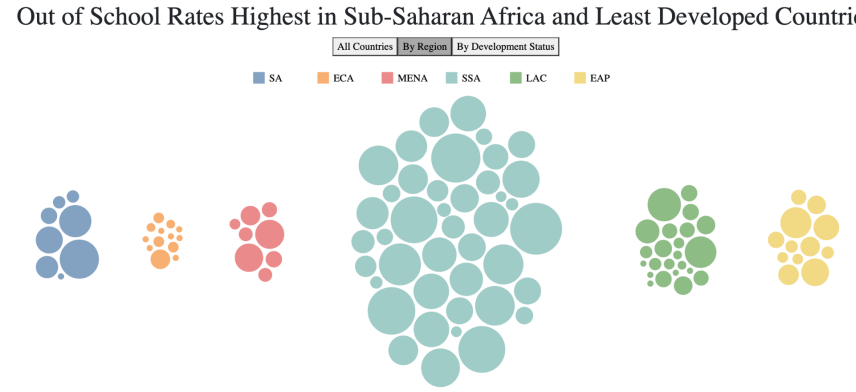
Our storyboard highlights the order in which the viewer will interact with our website.

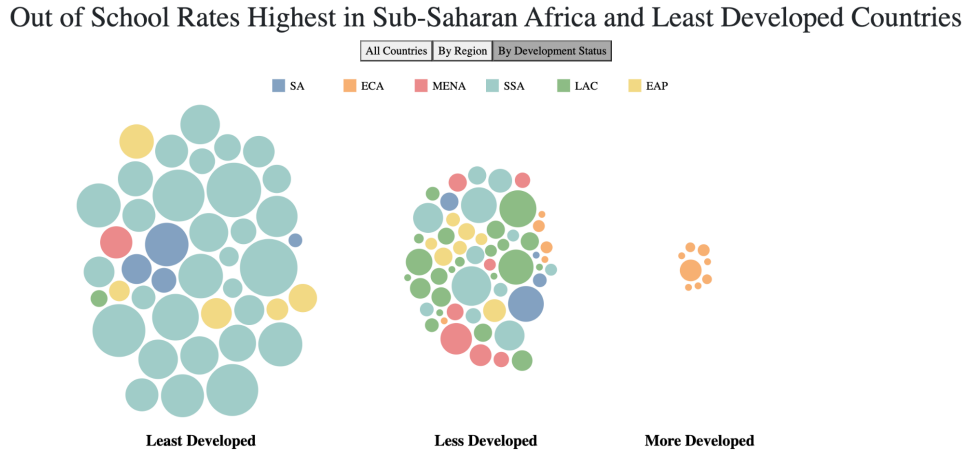


Innovative Vis design

- For our innovative visualization design, we created a bubble chart that can be sorted by all countries, regions, and development status
    - Below are screenshots that highlight the different views of this visualization

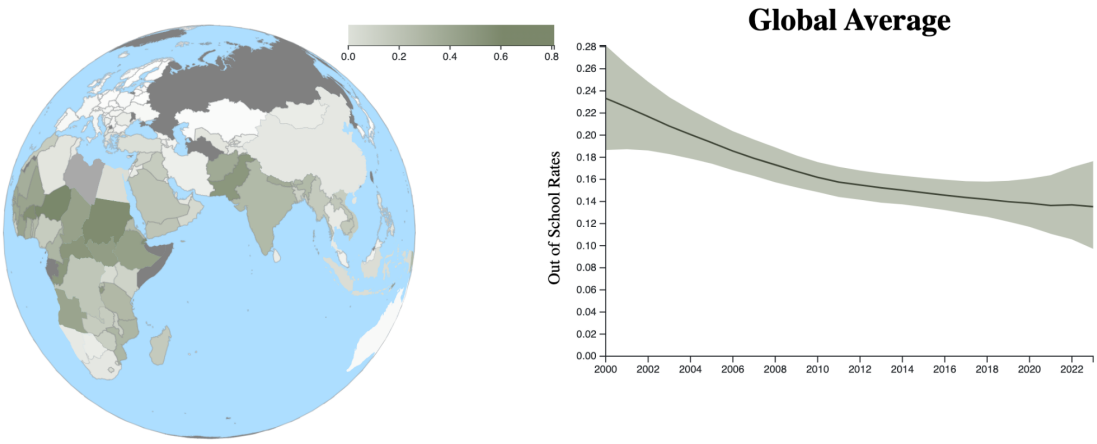
- 

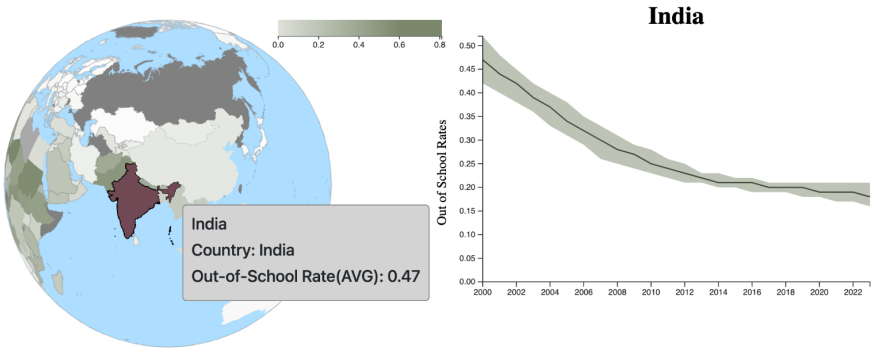
- 

- 

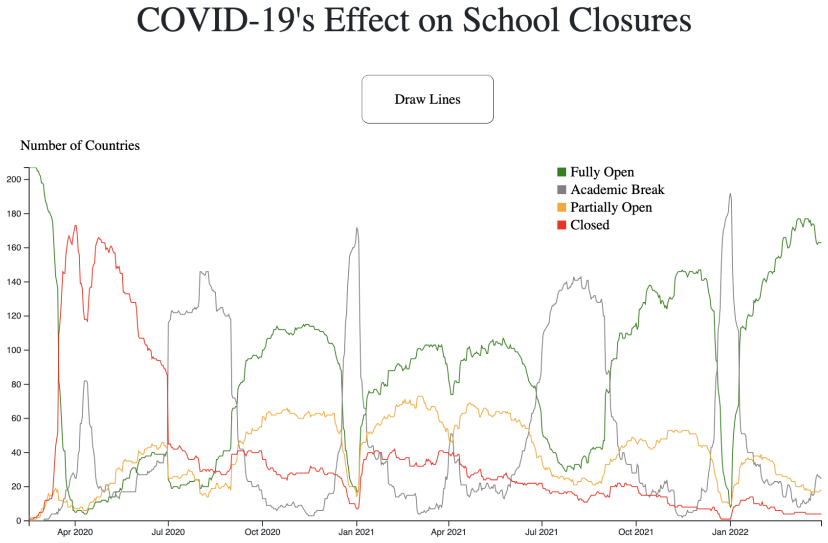
Interaction Design

- We created 2 visualizations that have interaction
- First, we have a globe that displays a line chart when you click on a country. The line charts changes based on which country is selected

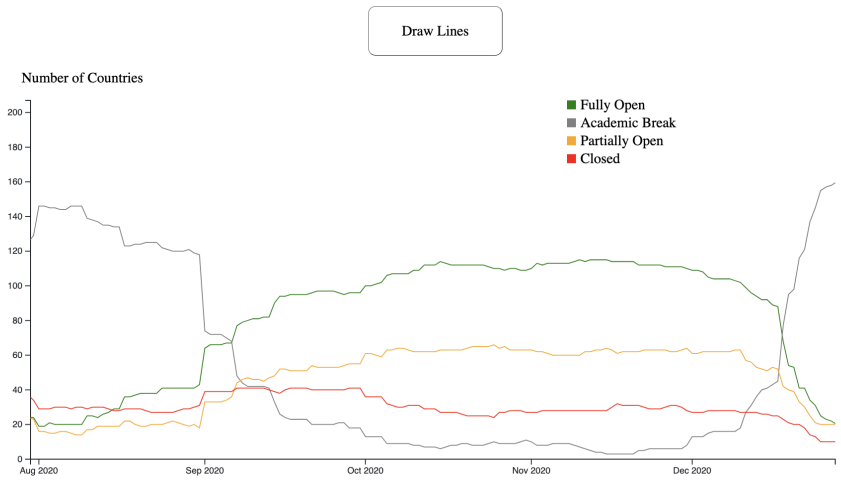
- 

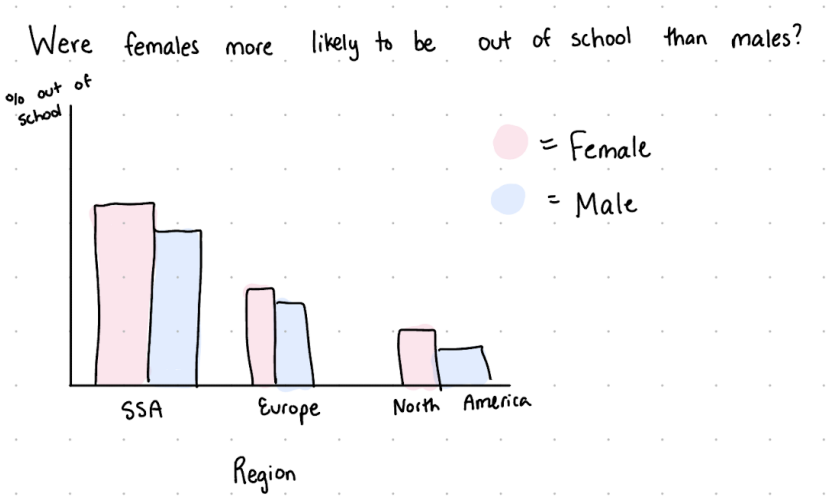
- 

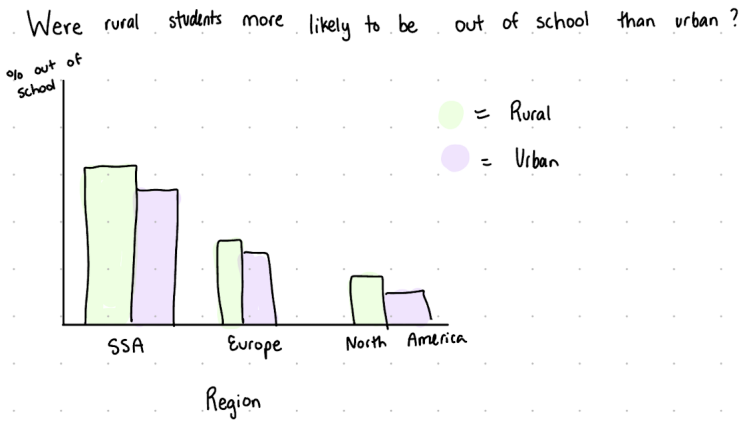
- Second, we created a line chart that allows the viewer to zoom in and out on specific time periods. It also interactively draws the lines when the button is clicked
    - Full View



    - Zoomed In View



- We also plan to add interaction to our bar charts highlighting different demographics and their out-of-school rates
    - Here is the initial sketch of the bar chart design
    - 



- We will implement a button that allows the user to select whether they want the chart to display Rural vs. Urban or Female vs. Male
- Further, we want to implement a carousel that allows the user to switch between data for primary schools, lower secondary schools, and upper secondary schools

Questions Going Forward

- We were wondering if you had any advice when it comes to our storytelling and the order we display information.
- We want to focus on the idea of having an international aid organization as our viewer and were wondering how best to craft the story for this audience. Do you have any suggestions for resources we should look into to get more background information on the topic?
- When we render the webpage on our different computers/browsers, we have an issue where the visual opponents appear differently in terms of their locations on the page. Sometimes this results in the components overlapping on one person's screen but not on another's. Do you have any suggestions for overcoming this issue?