C3: Design Evaluation & Report

Part 1: Basic Evaluation Plan

The goal for our user tasks was to get insight on three separate aspects of the prototype of our final visualization. We knew that we wanted to include a time series of coverage data encoded on a map of the US. We also wanted users to be able to highlight a specific state and gain further information about that specific state.

Another part of the visualization we wanted feedback on was the use of shading to present population coverage in a specific state, and how effective this was as a tool in the time series. We wanted to know if it was intuitive and understandable.

Lastly we wanted a separate visualization from the map time series that allowed users to see how premiums changed over time with a more traditional time series visualization. We also wanted users to be able to filter this data by income and state. This led us to our three tasks:

Task 1: Find Health Care Coverage by Race in a Given State

Task 2: Compare Population Coverage by State

Task 3: Explore Premiums over time

Part 2: Evaluation Results

User Performance Evaluation: In Class

The In-class users evaluating the prototype dashboard design were first-year Masters students. The individuals were presented with 3 tasks, and had to identify the steps required for each task.

The overall feedback received from all 3 users was largely positive. After finishing the tasks, all of our users said that the tasks made sense, and the presentation of information in the visualization helped move them through the tasks. However our users had several problems while performing the tasks.

In task 1, for two of the users the map time series was placed physically above the general time series. This caused two of the users to initially try and use the general time series, and not immediately get that the map was what we wanted them to use. It was also not immediately apparent for some that the sticky notes over Washington were meant to represent the ability to “hover” over and view more information. One comment we received was, “If depicting Healthcare Coverage by Race is an important feature of ACA, then it should be displayed on the front layer of the visualization, and not as a hidden layer”.

In the second task some of the users had trouble with the drawn bar at the bottom of the map. It didn’t immediately jump out as a slider to control the year being represented without some light prompting.

In the third task all of the participants quickly understood what the graph was for, but one user didn’t quite understand what we were asking for in the task. That was less of a problem with our visualization, and more with our communication.

After talking with our users, we felt that most of the problems and issues faced in our demo were due to the demo being a physical visualization, rather than an online visualization. The initial focus on the general time series visualization was because it was physically closer, and the overlooking of hovering over the state and the time series bar was because there was no way to move a mouse over them. We still got really helpful feedback about our visualization. The first was that it was not really intuitive that hovering over a state would break down coverage by race. Another was that it would be useful to have a benchmark year for the time series to be compared to as the year was changed. Lastly, a user thought it would be very helpful if the general visualization focused on only a

few specific states. Otherwise there would be 50 data points, which would be extremely hard to understand what was happening.

User Performance Evaluation: Out of Class

The users that were able to explore our prototype dashboard were three healthcare data scientists and analysts. These individuals were able to provide perspectives and feedback centered around usability and design.

The main positive feedback we received in terms of our prototype were our choice of included metrics as well as the opportunities for investigation by users. The users stated that the metrics included (coverage by state, average premiums, and state healthcare budgets), would allow for any individual exploring this dashboard to answer a wide array of exploration questions concerning the Affordable Care Act. When given the opportunity to explore the prototype dashboard, the potential users were able to easily navigate the suggested tasks, potentially aided by their experience in analytics and dashboard design. We received several suggestions that we will take into account when moving our prototype to the design stage.

We received suggestions specifically concerning approachability and usability. Two users suggested that the filters provided for the dashboard users should be labeled and consistent in terms of their cross-filtering capabilities. In addition, it was suggested that we maintain an approachable and streamlined dashboard at the surface level, and include more minute details under the focus/zoom/select level. While these details are important to the overall storyline, it was suggested we provide the opportunity for users to take in the data at both the surface level as well as the detail level. For example, it was suggested that our graph showing state premiums over time could include a single summarized time series that could change based on the filters or state selections. Overall, the potential users were able to provide helpful insight that will allow us to modify our dashboard to improve in design at the next stage.

Design Modifications

- Include State filter off to the side in the form of a dropdown list while displaying aggregate data as the default
- Add an annotation that states where the User can find information regarding relation between ACA coverage and Minority Groups
- Include more explicit labels and legends to increase readability

Design Elements Maintained

- Map interaction between different visualizations through state selection
- Browsing through the timeline using a slider for year selection
- Including a filter for different income groups

Appendix

Prototype Images

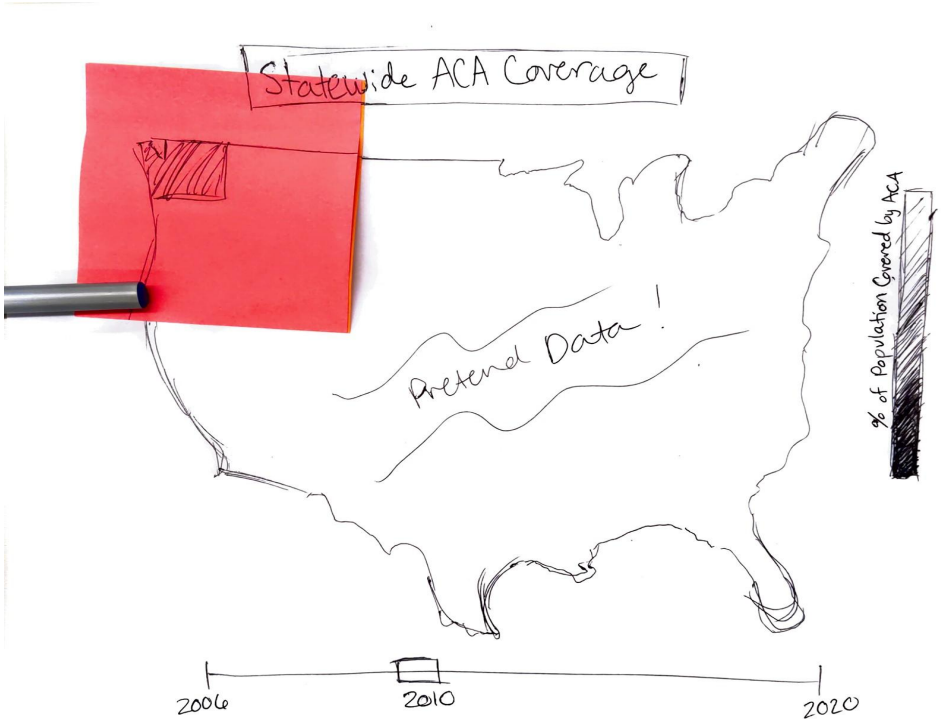

Fig 1: Representation of ACA Coverage by State over Time (Task 1 and Task 2)

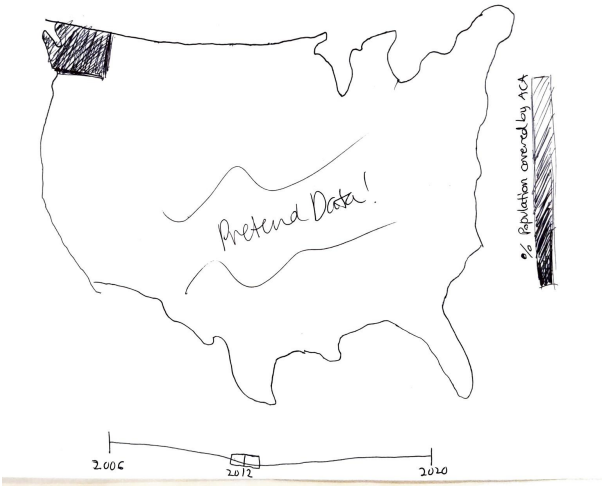

Fig 2: Representing ACA Coverage by State in Year 2012(Task 2)

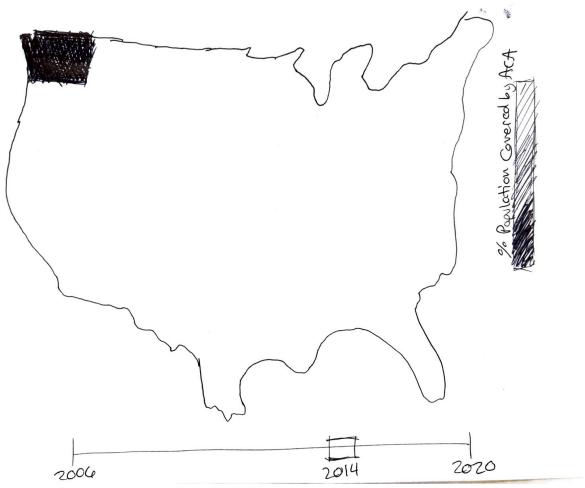

Fig 3: Representing ACA Coverage by State in Year 2014(Task 2)

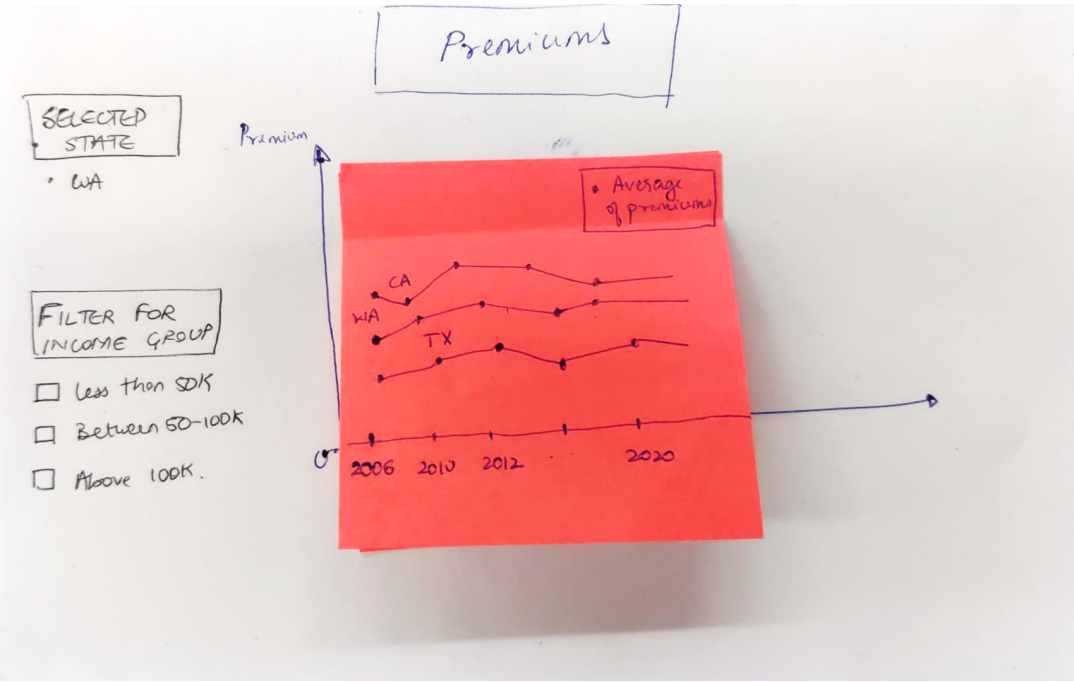

Fig 4: Representation of Change in Premiums over time, according to State (Task 3)

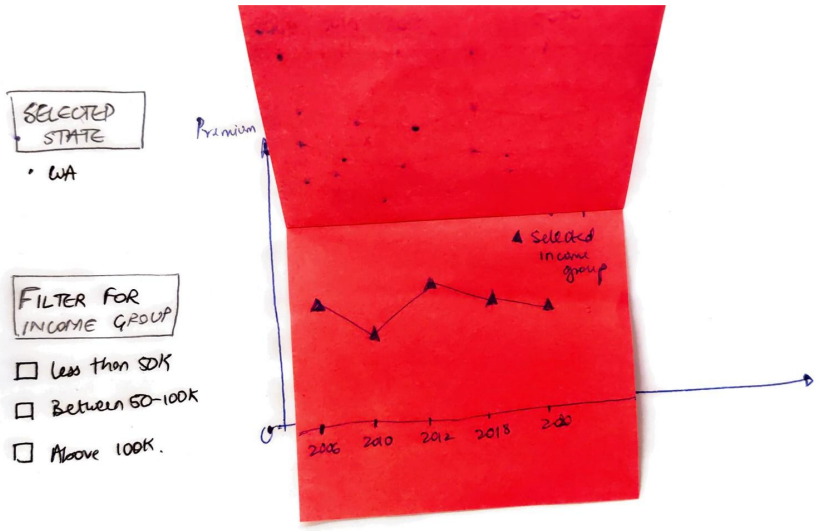

Fig 5: Representation of Change in Premiums over time, filtered according to Income Group (Task 3)