Matt Goetz
CSE 5544

With this project, our group was extremely interested in tracking the prevalence of the different diseases over time. Some questions we were interested in answering were, "How does the distribution of diagnoses change over time?", "Is there a typical pattern in how different diseases progress through patients?", and "Are diagnoses more or less prevalent as time goes on?". We wanted to focus on trends so the viewers of our visualization could easily see the change in diagnosis over time. Additionally, we looked at our data with respect to year as opposed to days since TBI. This was quite different from most of the other groups, but we did this because we really just wanted to focus on the change from year to year. We were interested in how diagnoses changed over time and wanted to see if over the years, less people were going to the doctor for various diseases. We also wanted to more easily see how, after each year, the distribution of disease diagnoses shifted. Our abstract task with this project was to depict major transfers within a system. We wanted to map changes among group distribution in time series data.
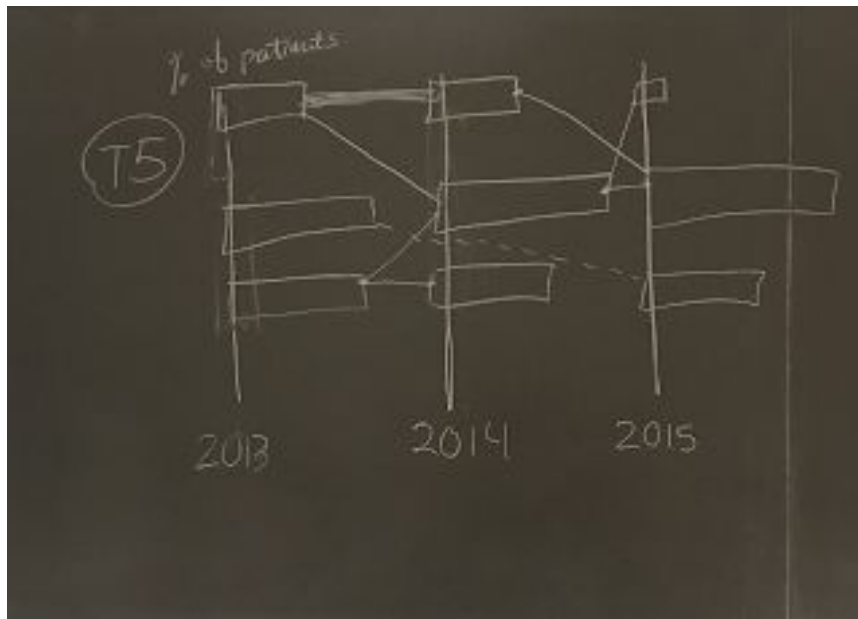
Pictured above is the final design that our group came up with. The horizontal bars on each vertical axis represent the prevalence of each disease in different years as measured by percent of total patients. So if 30% of patients experienced no symptoms one year while 20% experienced depression, the bars will be at 30% and 20% respectively. Then we will track the disease progression of patients from year to year. We have lines from horizontal bars in one year to the bars in the next. So if a patient had depression in 2013 and then anxiety in 2014, there will be a line connecting the

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2013 depression bar to the 2014 anxiety bar. The thickness of the lines will depend on the number of people that follow the same path of having the same diagnosis two years in a row. With the visualization above, the thickness of lines and size of the bars helps the viewer see how the distribution of diagnoses changes over time, and more specifically, how diseases typically progress and then later transition into other diseases.

I believe that our design does a good job at showing this change in distribution of diagnoses over the years. Additionally, this design shows how diseases transition from year to year with the lines that we added between bars. The biggest concern with our design though is that it doesn't show individual encounters and may focus too much on overall trends. Also, while we accomplished our task by using year instead of days since TBI, but after further inspection and viewing other groups' projects, it may have been more beneficial to put "Days since TBI" on the x-axis. Using "Year" tells a story about the change over time from year to year, but I believe "Days since TBI" would allow the viewer to gain more insights from the graph and would be able to learn more than simply year. It would tell more of a story than year would.

On a 24 inch screen, I believe you would be able to fit many items in our design. This is one area where I believe focusing on disease as opposed to each specific patient helps our design, since showing the 18 or so diseases is much easier than showing all 45 or so patients. I think our design does use a overview+design technique. This technique uses "spatial separation between focused and contextual views". I believe we utilize this technique by showing a more contextual view with the horizontal bars, as you can see the proportion of each disease among the total diseases, but then when you look closer you can see the lines and see how those diseases progressed from the year prior. From afar, you may be able to see that a great amount of people had depression one year. As you look closer, you may be able to see that a great number of those people also had anxiety the year before. Additionally, our design also shows temporal changes since all of our measurements are being taken with respect to how they change from year to year.

After really thinking about our design, all of the lines that we intend to draw to show the progression of diseases from year to year might introduce some clutter. Additionally, we were not aware of how many people showed symptoms for multiple diseases in one year, which in turn would make our design much more cluttered and difficult to follow. It helps that we have diseases across the vertical axis as opposed to individual patients since there are many less diseases than patients, but I believe the design would get

cluttered with all of the lines and trying to really make sense of how one disease transforms to another. So, you would not be able to see a single individual's progression, but instead just aggregate change from one disease to all the other possible transformations to other diseases the following year.

I believe that the design is visually pleasing. I think having data shown through the horizontal bars as well as the lines with varying thickness is pleasing to look at. There aren't too many years as well, so I don't think it would feel like the bars are squished. All in all, I think the design would be pleasing to look at, but if we were to do this again, we would definitely try to incorporate "Days since TBI" and try to do something where we can track individual progress.

Part 2--- Implementation - Critical Evaluation

The design that was voted on by the class is very different from the design that my group created. They chose to focus on each individual encounter and then show from there how each person receives diagnoses over time with respect to time before or after their traumatic brain injury. This design also shows temporal changes, but in a different measurement since they look at days before or after TBI as opposed to just year. I think that days before or after TBI is a much more effective way to present this data since the viewer can a lot more information away by looking at TBI data as opposed to just year. Since the days since TBI increase as you move from left to right along the x-axis, it is clear that this design still shows the chronological change in diagnosis', but with the added benefit of easily comparing that to when the patient had their TBI. This graph lets the viewer much more effectively see how often a patient had encounters and when those occurred around their TBI. My main critique for the visualization that I have produced on Tableau is that you cannot see which diseases people have each time since it simply shows encounter and which year that encounter took place. I believe it would be extremely beneficial to find a way to group the diseases and then color the encounters based off of that grouping. That would tell a lot more information than simply the year an encounter took place. Additionally, the visualization is a little bit cluttered since there are so many different patients. You have to actually scroll up and down to view all of them. Again, it is very nice that you can track encounter progression for each individual, but it gets a little cluttered with so many patients.