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UCSF Team 4 Second Interactive Design and Write-up

Project Statement

Delirium is a serious disturbance in mental abilities that results in confused thinking and reduced awareness of your environment. According to UCSF, 25% of adult care patients develop delirium during their stay at UCSF. In Fall 2016, UCSF implemented the Delirium Reduction Initiative (DRI), a program to reduce the incidences of delirium at UCSF. UCSF wants to understand the overall and per hospital location performance of the program. The goal of the online dashboard is to help the hospital's directors evaluate the performance of the program and use the key metrics to decide which locations require funding to improve overall program results and patients' well-being.

Solution Overview

We implemented two views in this online dashboard: Program View and Location View. Both views show the following key metrics: delirium duration, length of stay, and compliance rate. The program view also provides patient outcomes. The location view also provides one additional metric: number of delirious patients. A baseline for each location was set by our team.

Personas and Scenarios

1. Andrea Plat: She is a location director and is primarily concerned with the performance of her location. Her key scenarios are:
    a. See her location's current delirium duration
    b. Compare her location's key metrics to other units
    c. Compare her location's key metrics to her own location's baseline
2. Jessica Chao: She is the program manager of the UCSF DRI. Her primary goal is to understand the program's overall performance and each location's performance to make informed funding decisions. Her key scenarios are:
    a. Decide which units are successful and which are problematic
    b. Measure the effectiveness of the overall DRI
    c. Decide how to best allocate funds for the initiative
3. June Chan: She is the senior director of nursing practice at UCSF Hospital. Through the online dashboard, she hopes to easily see a high-level view of the DRI's performance to make funding decisions. Her key scenarios are:
    a. Visualize overall program performance overtime

b. Correlate results to show program's overall effectiveness

Descriptions of the Final Interface Design

Describe the functionality

The Program View allows users to hover over the line graphs to view delirium duration, length of stay, and compliance rate (key metrics). A horizontal bar graph allows users to hover over it to see the year-to-year increase/decrease of each patient outcomes.

The Location View provides line graphs for delirium duration, length of stay, and number of delirious patients for all the locations (key metrics). The user can click on the 'location' on the top selection bar to see these metrics for a specific location. Once a location is selected, the line graphs for the chosen location will be highlighted.

Describe main parts of the interaction flow

On the Program View, the user first sees today's program performance numbers like compliance rate, delirium duration, length of stay, and number of patients. As the user scrolls down, the user sees two line graphs: one displaying the trends of delirium duration, length of stay, from 2016 to 2017, and just for 2017. Next, the user will see a significant decrease in the number of patients that go against medical advice, and a slight increase in patients who go on to a secondary care facility from 2016 to 2017. Lastly, the user will see compliance rate from 2016 to 2017. The takeaway message of the Program View is to show decreasing delirium duration and length of stay and increasing compliance rate.

On the Location View, the user first sees line graphs of delirium duration, and length of stay for all locations. Once a user selects a specific location that chosen location's data will be highlighted. This allows the user to see the chosen location's current performance compared to that location's baseline performance, and also that location's performance compared to other locations'. Lastly, the user can explore the number of patients and percentage of time spent delirious per location.

What was omitted you'd like to include

We'd like to include the financial impact of the DRI. When we spoke to our client, Jessica Chao, she is interested to know how the program would affect the overall hospital financial performance. Her prediction is that a decrease in delirium days and length of stay per patient would improve hospital financial performance. However, we do not have access to the financial data so we could not graph the trends.

Design Evolution

Figure 1: Initial Sketch

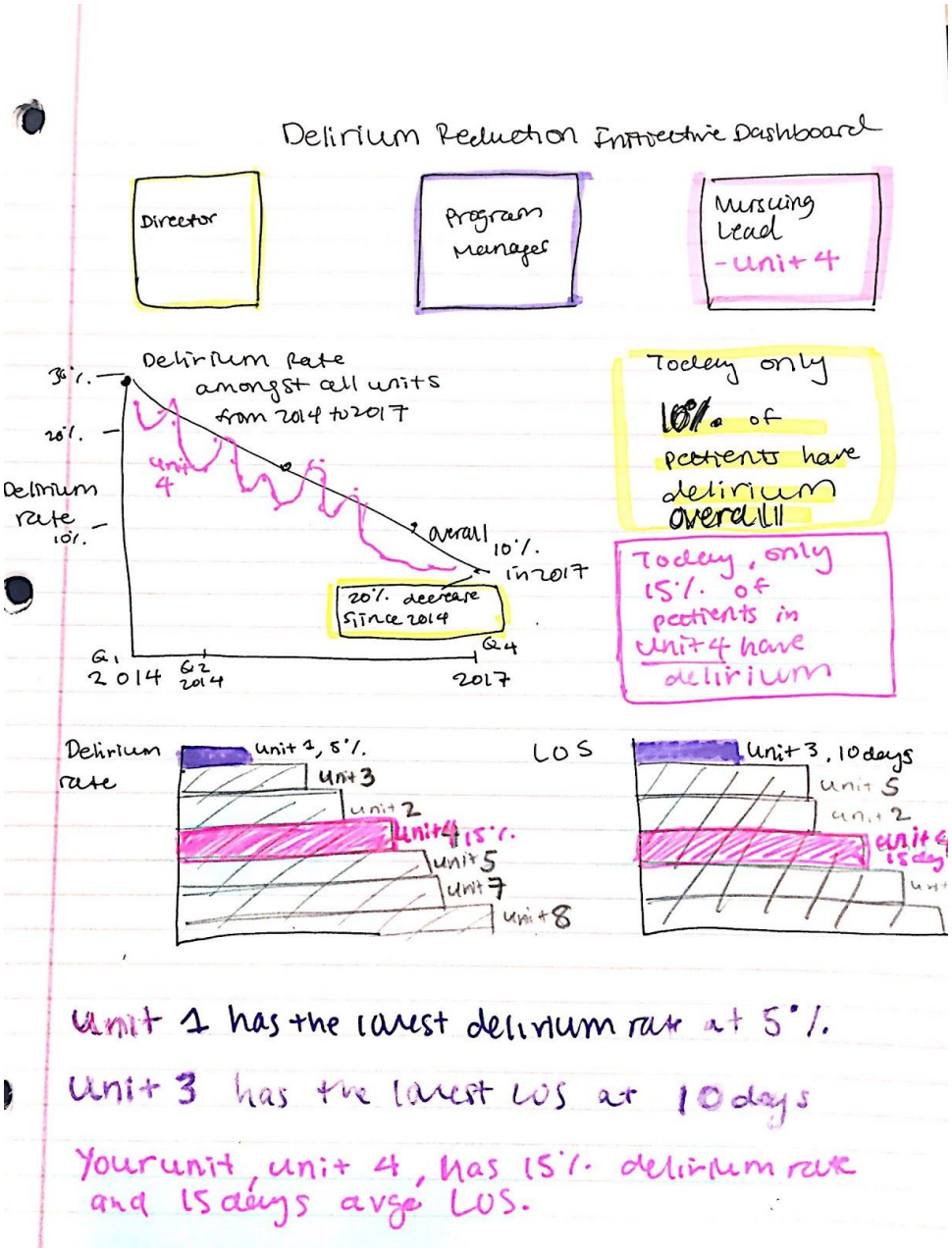


Figure 2: Paper Prototype and Storyboard - Program View

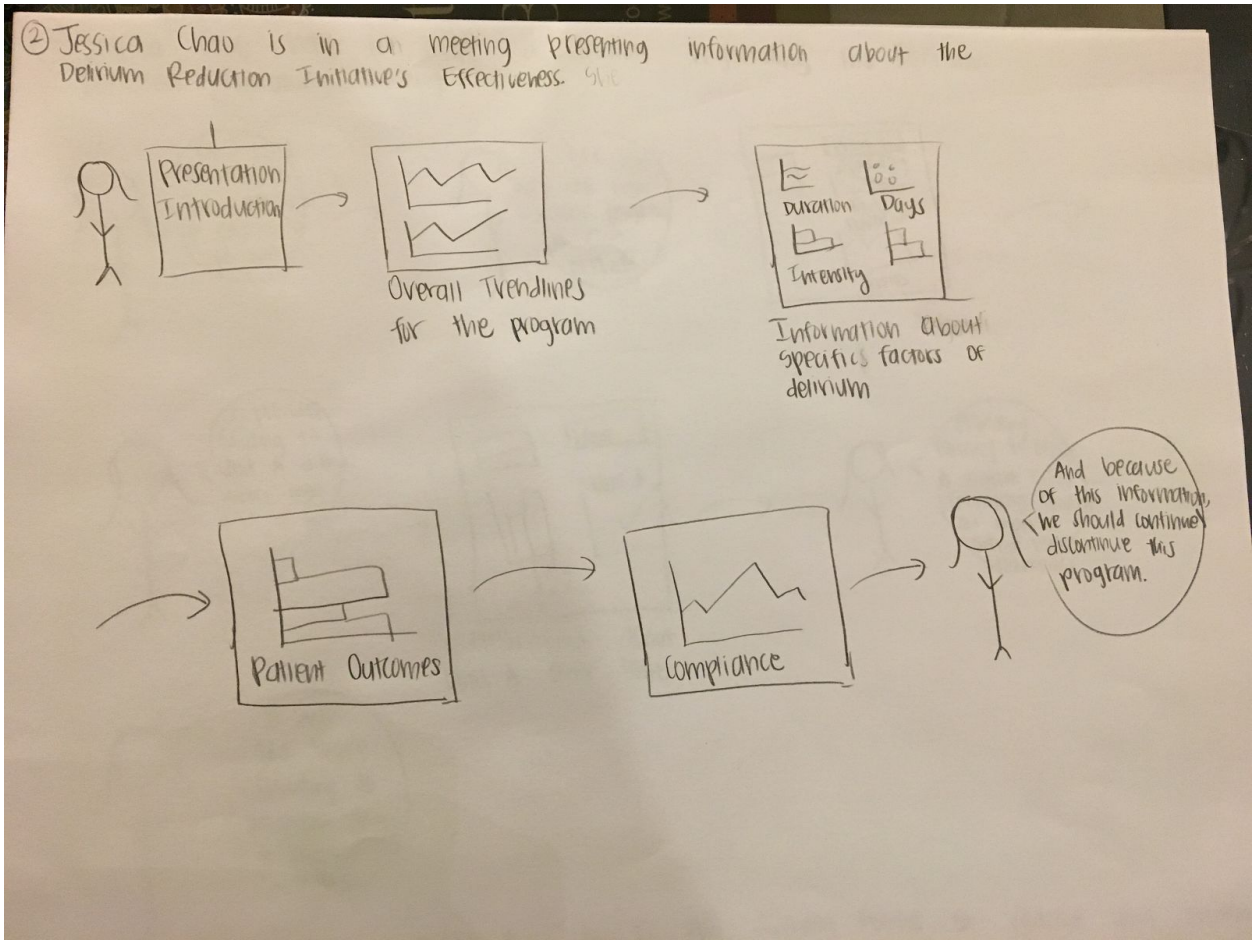


Figure 3: Paper Prototype and Storyboard - Unit View

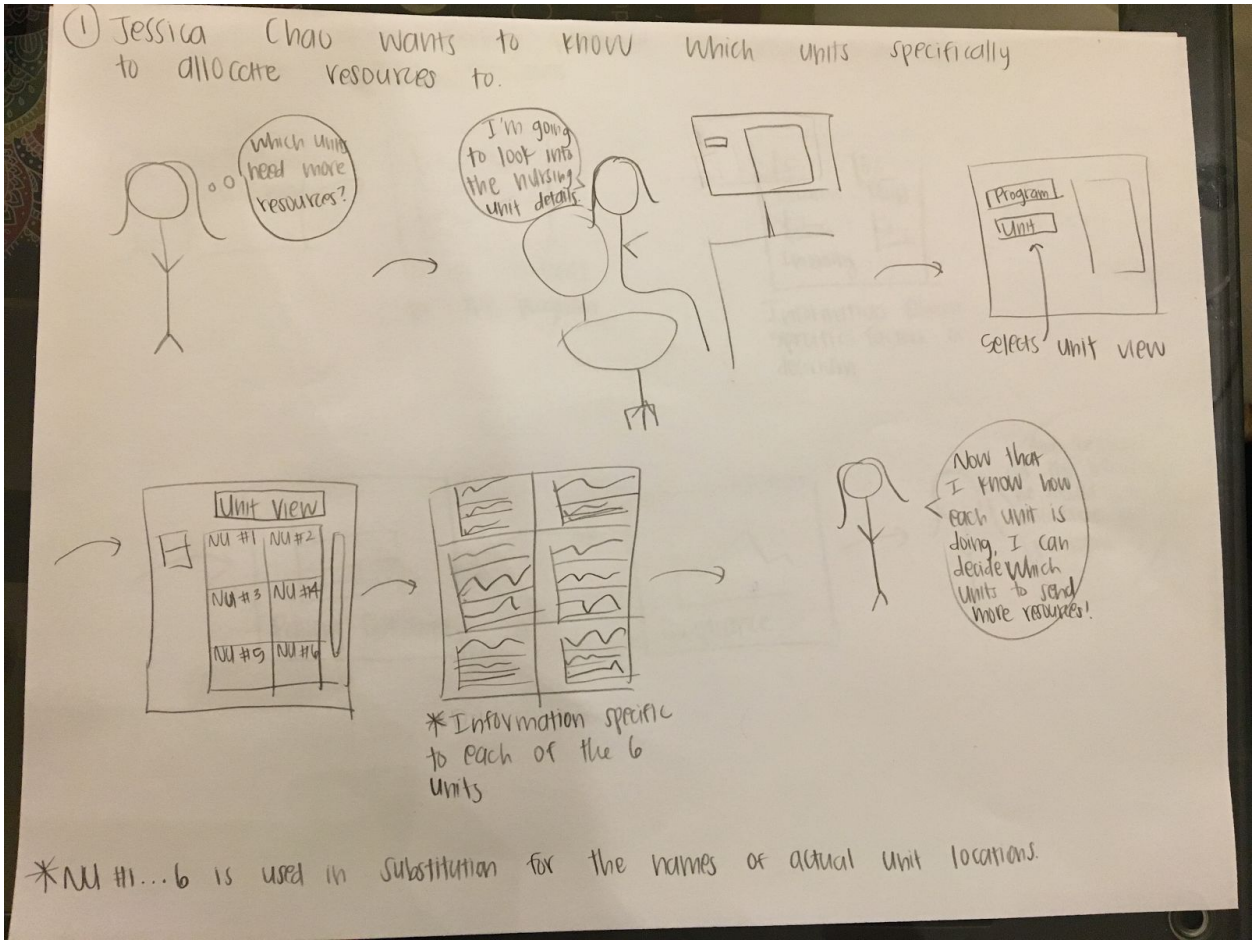


Figure 4: First Iteration - Program View

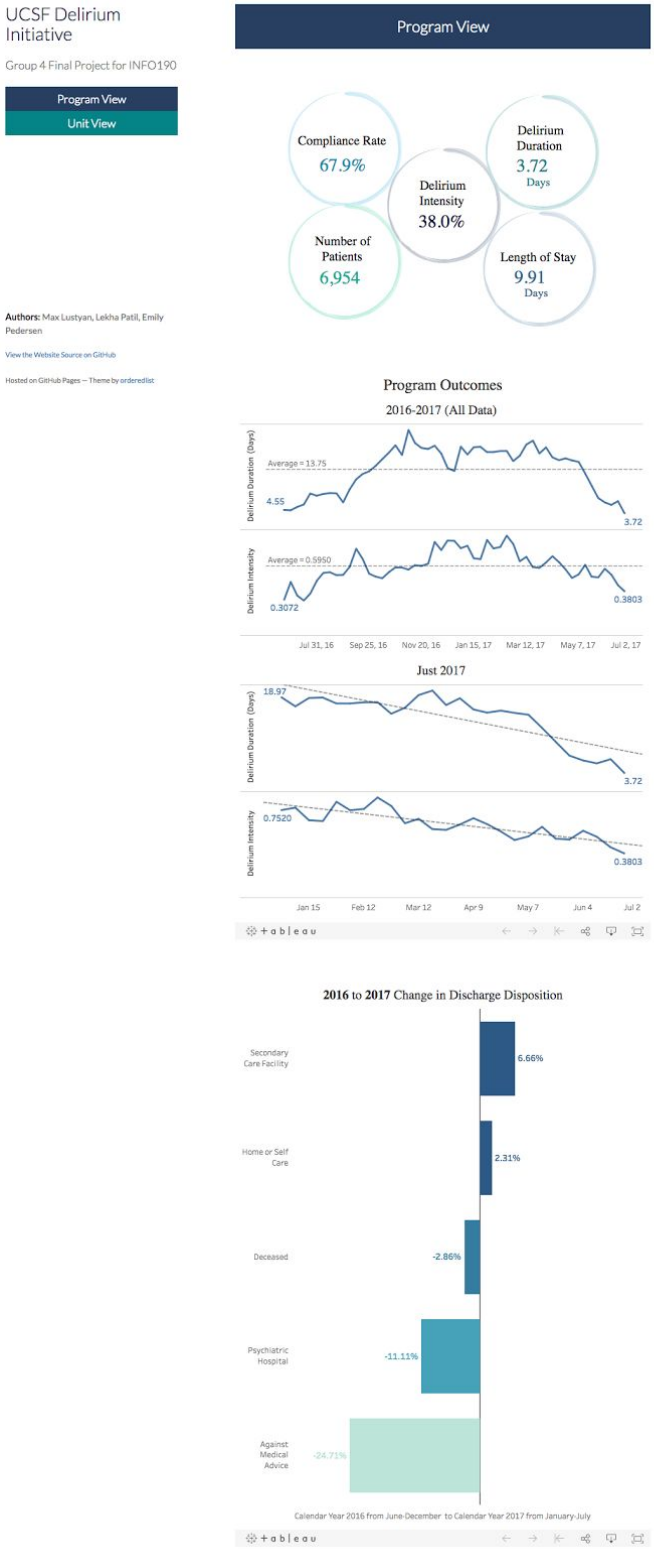


Figure 5: First Iteration - Location View

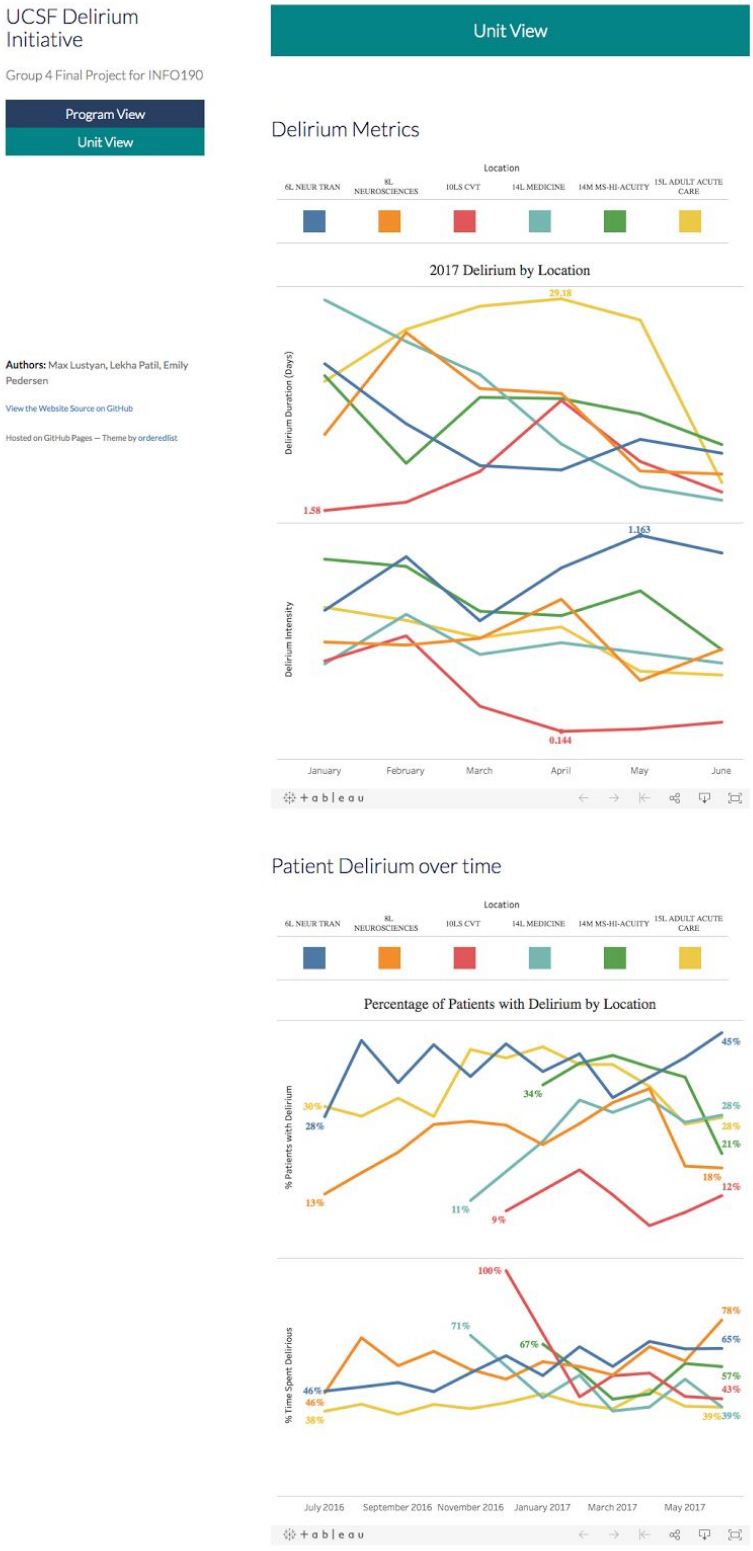
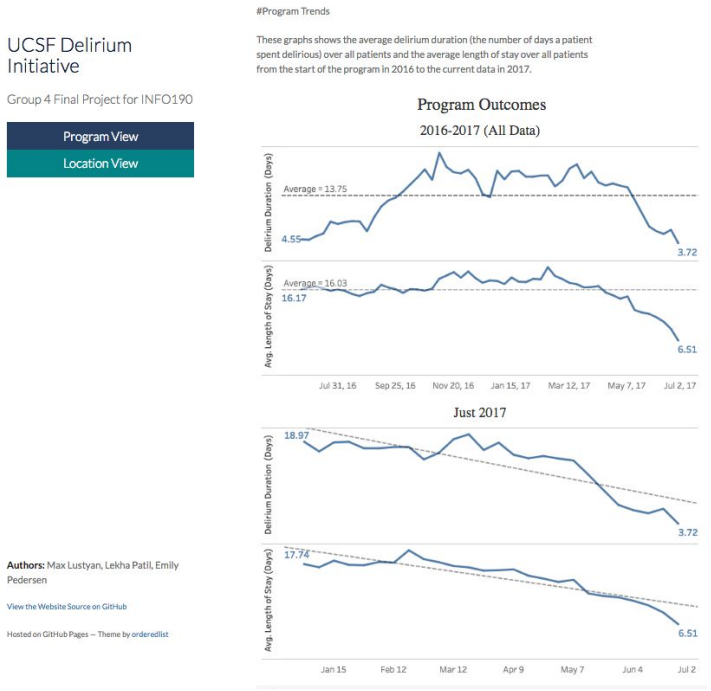
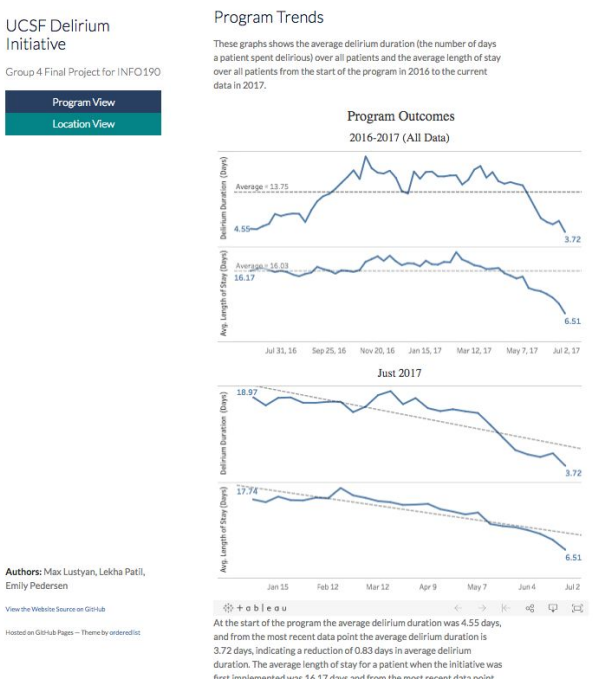


Figure 6: Second Iteration - Program View





UCSF Delirium Initiative

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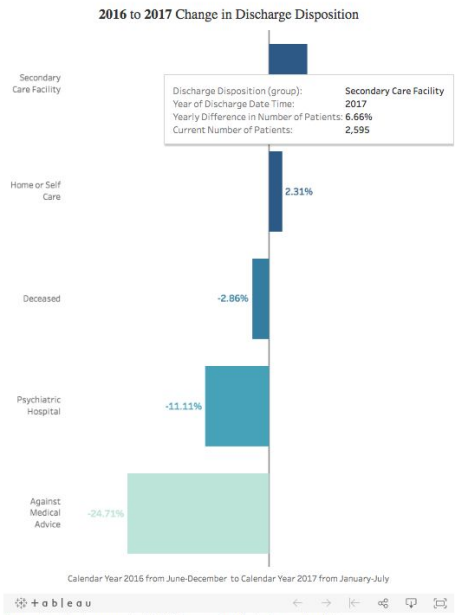
Program View

Location View

This graph displays the change in percentage of patients' discharge outcomes between 2016 and 2017.



The most drastic changes are the 24.71% decrease in patients who went against medical advice between 2016 and 2017 and the 6.66% increase in patients who

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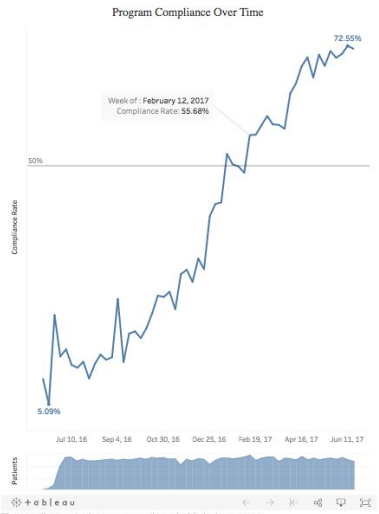
Program View

Location View

Program Compliance

The rates of compliance for AWOL and NuDESC are calculated since the start of the program as well as in just 2017. The corresponding number of patients each week is indicated in the area graph below.



The compliance rate shows an upward trend with the lowest rate (5.09% compliant) occurring in the second week of the initiative's implementation and the highest rate (72.55% compliant) occurring in the second to last week of the current data provided. From the start of

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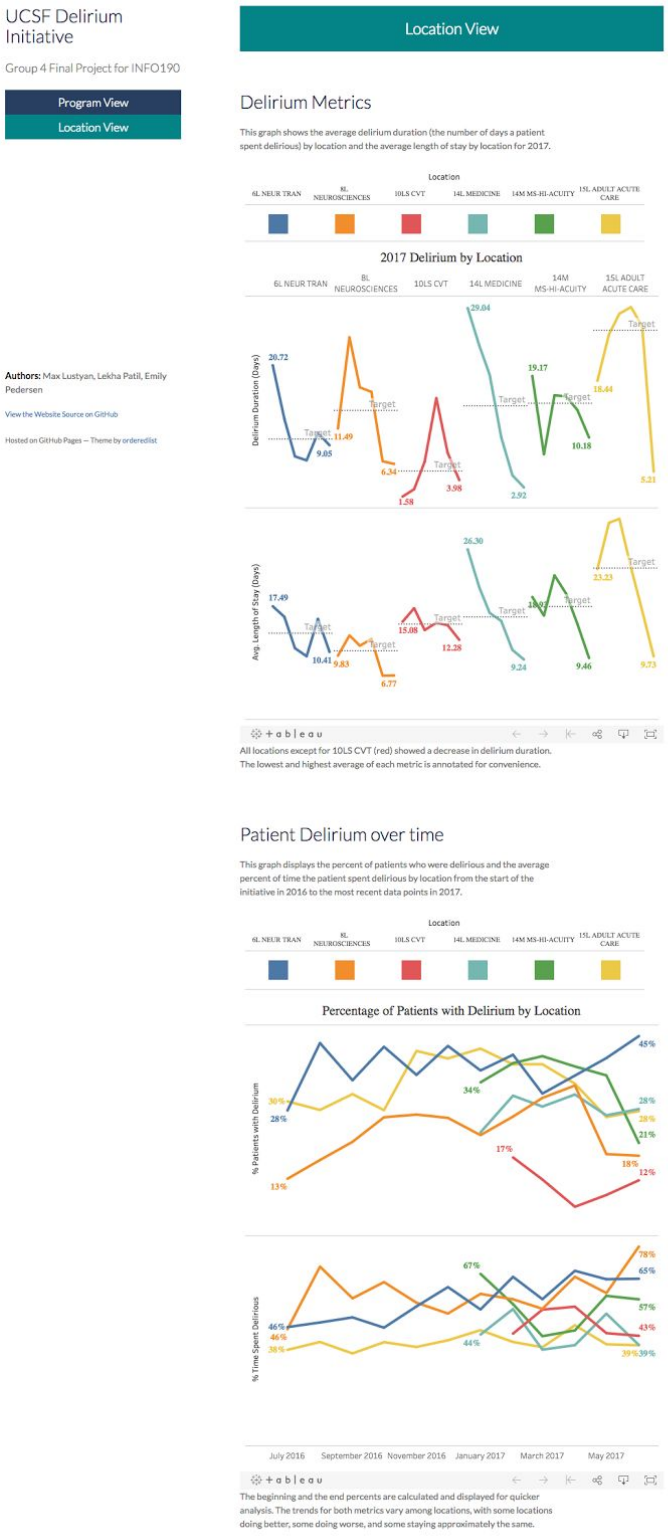
Figure 7: Second Iteration - Location View



In our initial sketch (Figure 1), we designed the view by role: director, program manager, and nursing lead. When a user clicks on a view, information relevant to that role would be highlighted. In our initial design, we also had graphs that showed the decrease in delirium rate overtime and delirium rate for each location. Before drawing our paper prototype, we decided we should provide the view based on location instead of by role, hence the program and location views. In our paper prototype (Figures 2 and 3), we identified two key tasks: measuring the effectiveness of the overall DRI, and investigating which units are successful and which are problematic. In Figure 2, the program view displays trends in delirium duration, days, intensity, patient outcomes, and compliance rate, allowing the user to gauge the overall performance of the program. In Figure 3, the location view displays the same metrics as the program view by location, allowing the user to gauge which locations are successful or problematic. For our first iteration, we built tableau dashboards to visualize these trends. In Figure 4, we see trend lines in delirium duration, and intensity. We also see percentage change in patient outcomes from 2016 to 2017. In Figure 5, we see trends lines for each location, and also how many patients and percentage time spent delirious for each location.

From our usability study, we learned that our client, Jessica Chao, wants us to focus on delirium duration and length of stay for both the program and location views, as those are the key metrics in determining the success of the program. Our client also wants to see trends in compliance rate for both the program and location views. For the location view, she'd also like to see a baseline metrics for each location. This allows the user to later determine if delirium duration and length of stay is decreasing/increasing for that location. Finally, she also wants to see captions describing the graphs. In response to that feedback, in Figure 6, we added trend lines for length of stay and compliance rate and removed delirium intensity. We also added graphs captions. In Figure 7, we again added trend lines for delirium duration and length of stay and removed delirium intensity. We also added a baselines for those metrics, and graphs captions.

We hope our the second iteration of our design allows the user to see the overall and location performance of the program, and aid in funding decisions.

Team Contributions

Team member	**Website**	**Write-up**	Presentation
Max	Updated the tableau files and website to reflect usability study feedback - Overall for website: 60%		
Lekha	Wrote the introduction and captions for the website - Overall for website: 40%		
Emily		Wrote the 'second iterative full design write-up' - Overall for write-up: 100%	Created the slide deck - Overall for presentation: 100%

Links

Project website

https://uadjet.github.io/DataViz4Delirium/

Class presentation

Presentation

Appendix

Please find attached the Tableau and illustrator files