

MyHealthTeams Data Exploration and Visualization

Introduction

Our client MyHealthTeams is an independent startup based in San Francisco that provides social networks for people facing chronic conditions. Via the online platform, users have the option to share information regarding their diagnoses, symptoms, comorbidities, treatments, and details about each treatment. Using this self-reported data, our group performs data visualization and statistical analysis to find correlations and provide insight into the perceived efficacy of different treatment options.

Objectives

1. Visualize medication data for understanding treatment pathways;
2. Enable insights regarding the prescription prevalence of different treatments, prescription variability over time, and correlations to reported efficacy;
3. Make the process of data exploration and visualization easily replicable for the future data.

Data Cleaning	Data Visualization
R-Studio: <ul style="list-style-type: none">● Remove unnecessary symbols and spacing● Uniformize the treatment list by replacing all off brand drug names/active ingredients with their more well known name● Initially spell checked by hand● Replaced this with an automated drug spell checker to expedite process, using an NIH online database	Sunbursts: <ul style="list-style-type: none">● Used html, javascript, and css to plot radial tree maps for treatment pathways Likert Scale: <ul style="list-style-type: none">● Created a stacked bar graph to visualize users' perceived efficacies of treatments
Java: <ul style="list-style-type: none">● Manipulate the data into a usable format● Program was written to expand user information from a single cell entry into columns separated by category	Predictive Model for Response to Medications <ul style="list-style-type: none">● Use the R package rpart to create random decision forests

Reference:
 Hripcsak, G, et al, “Characterizing Treatment Pathways at Scale Using the OHDSI Network.” Proceedings of the National Academy of Sciences 113.27 (2016): 7329-336.
 Rodden, Kerry. “Sequences Sunburst.” Popular Blocks. N.p., 17 June 2017. Web. 25 July 2017

Analysis & Results

Sunbursts: Treatment Pathways

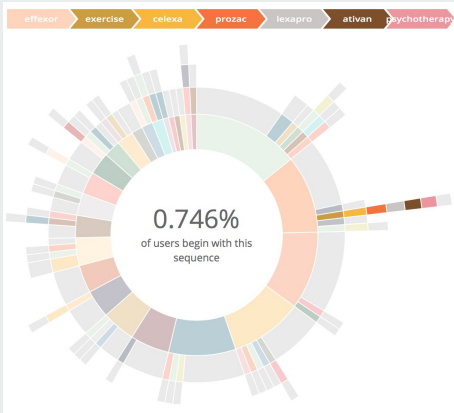


Figure 5: Sunburst for users with Seasonal Disorder Depression (134 users)

- Treatment pathways: the chronological sequence of treatments that a patient takes;
- A radial treemap (sunburst) displays treatment pathways for a subset of users;
- Users grouped by type of depression, gender, symptoms, and comorbidities.

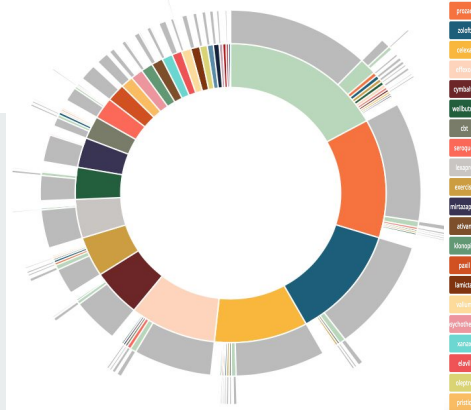


Figure 6: Sunburst for all viable MyDepression Team users

- 12251 viable users out of 47052 total users;
- 1.48 treatments listed per user on average;
- 686 unique treatment entries;
- Most users reported only one treatment, and thus longer trails do not have enough users to be displayed.

Likert Scale: Efficacy of Treatments

Efficacy Scale: 0 for ineffective; 1 for effective; 2 for very effective

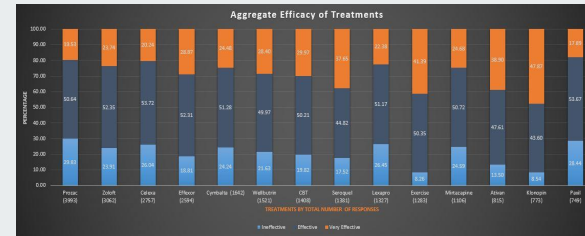


Figure 7: Average Effectiveness 1.09

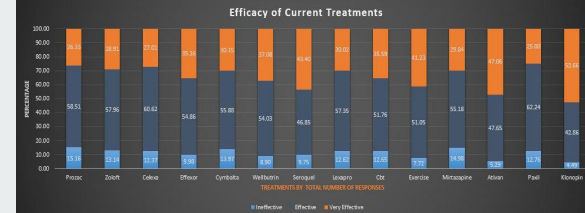


Figure 8: Average Effectiveness 1.25

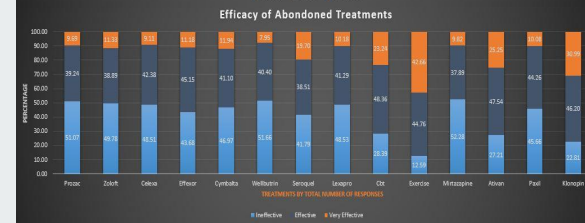


Figure 9: Average Effectiveness 0.73