

# Visualizing Clinical Data of Patients at the Child and Adolescent Psychiatric Emergency Unit

John-Jose Nunez

Mona Fadavi

# Background

---

- Child and Adolescent Psychiatry Unit (CAPE) only short-stay psychiatric ward in the province for 17 year old or younger patients
- Common presentation: suicidality, depression, psychosis
- Ongoing large multi-disciplinary project to collect data on patients and use for suicide prediction



## Motivation/Who

We possess a manually created database covering around 333 patients

Would like to visualize their data!

Vis would allow exploration to learn about our patients

Little previous work looking at this!

**Users:** hospital managers, psychiatrists, researchers

## Motivation/Who

### **Example Questions:**

- Do our patients follow expected patterns of illness eg more depression in the fall, mania in the spring?
- Does suicidal ideation/attempts increase at stressful points during the school year?
- Is medication use consistent with evidence-based guidelines?

## Motivation/Who

### **Important consideration:**

- Current physician workflows incorporate very little technology, and very little vis
- Doctors are very scared of complicated Vis!
- Our Vis must be very simple, at least initially

# Data/What

**Items** = patients = 333

**Attributes** (Categorical, Ordinal, Quantitative)

- Demographics (gender, age, ethnicity, postal code)
- Date and reason for admission
- Medications and dose
- History:
  - Psychiatric history (diagnoses, previous admissions)
  - Medical history (diagnoses, surgeries)
  - Substance use history
  - Social history (family structure, foster care)
- Symptoms on admission
- Various clinical scale quantifying various symptoms

# Data/What

## Data is hierarchical! E.g.

- **Diagnosis**
  - Psychotic Disorders
    - Schizophrenia
    - Brief Psychotic Episode
  - Depressive Disorders
    - Major Depressive Disorder
    - Persistent Depressive Disorder
  - Anxiety Disorders
- **Medications**
  - Antidepressants
    - Fluoxetine
    - Sertraline
  - Antipsychotics
  - Sedatives
  - Stimulants

## Data/What

**Data also is also repeated for different time periods....**

- **Diagnosis**
  - Diagnoses at admission
  - Diagnoses at discharge
- **Medications**
  - Medications in last 12 months
  - Medications on admission
  - Medications on discharge



# Actions/Why

- **Consume**
  - Discover- definitely!
  - Present – maybe?
  - Enjoy – no!
- **Produce**
  - Probably not yet, maybe in the future?
- **Search**
  - Explore/browse more than others, but likely all search tasks.
  - We won't be visualizing individual patients, just varying subsets
- **Query**
  - Identify, and summarize will be important. Compare will be too, unsure whether we'll need a specific compare function

# Actions/Why

- **Consume**
  - Discover- definitely!
  - Present – maybe?
  - Enjoy – no!
- **Produce**
  - Probably not yet, maybe in the future?
- **Search**
  - Explore/browse more than others, but likely all search tasks.
  - We won't be visualizing individual patients, just varying subsets
- **Query**
  - Identify, and summarize will be important. Compare will be too, unsure whether we'll need a specific compare function

## Actions/Why

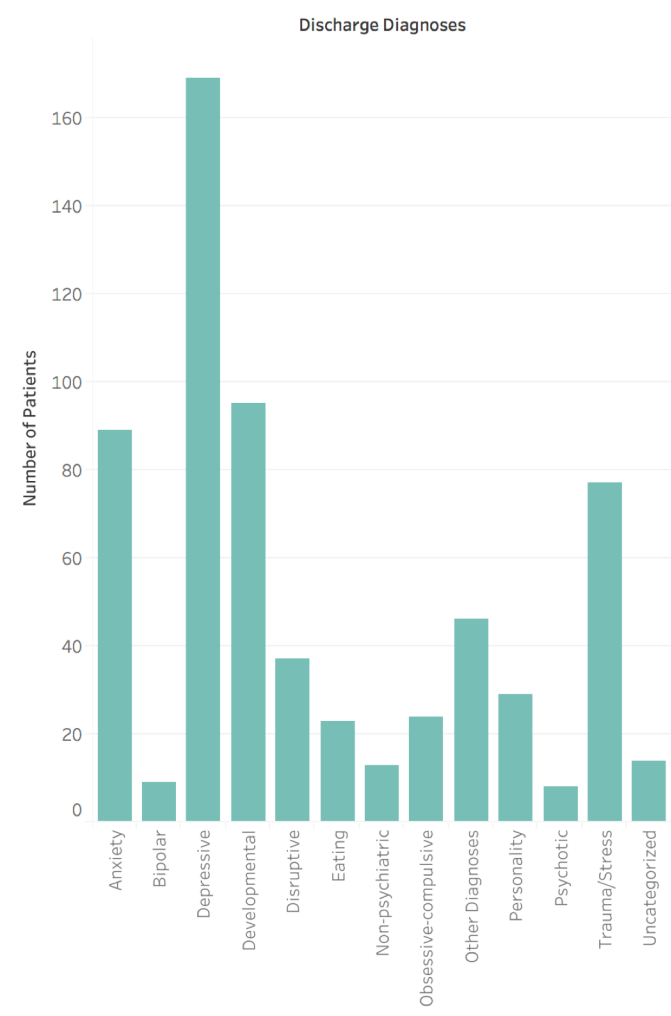
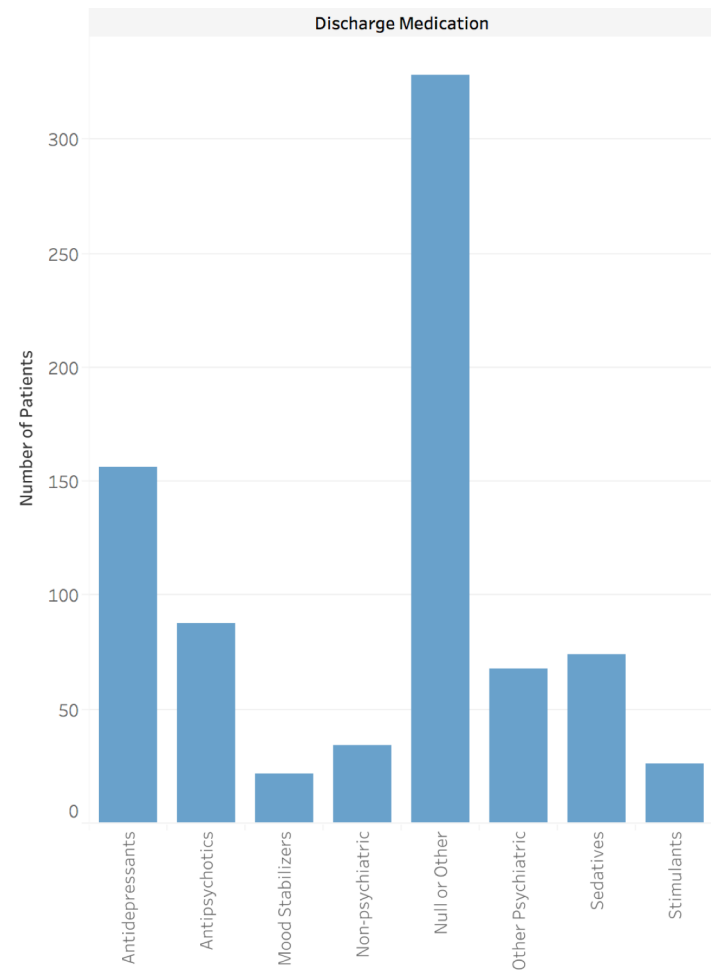
- Filtering + Compare will be a key features
- E.g. compare antidepressant medications of males vs females
- Users will likely not want to view all data at once
- Different users may have widely different use cases

# Design Principles

- Must start as simple, not be intimidating, “not mathy”
- Must allow different use cases
- Must allow filtering/selection (both attributes and patients)
- Must be intuitive!

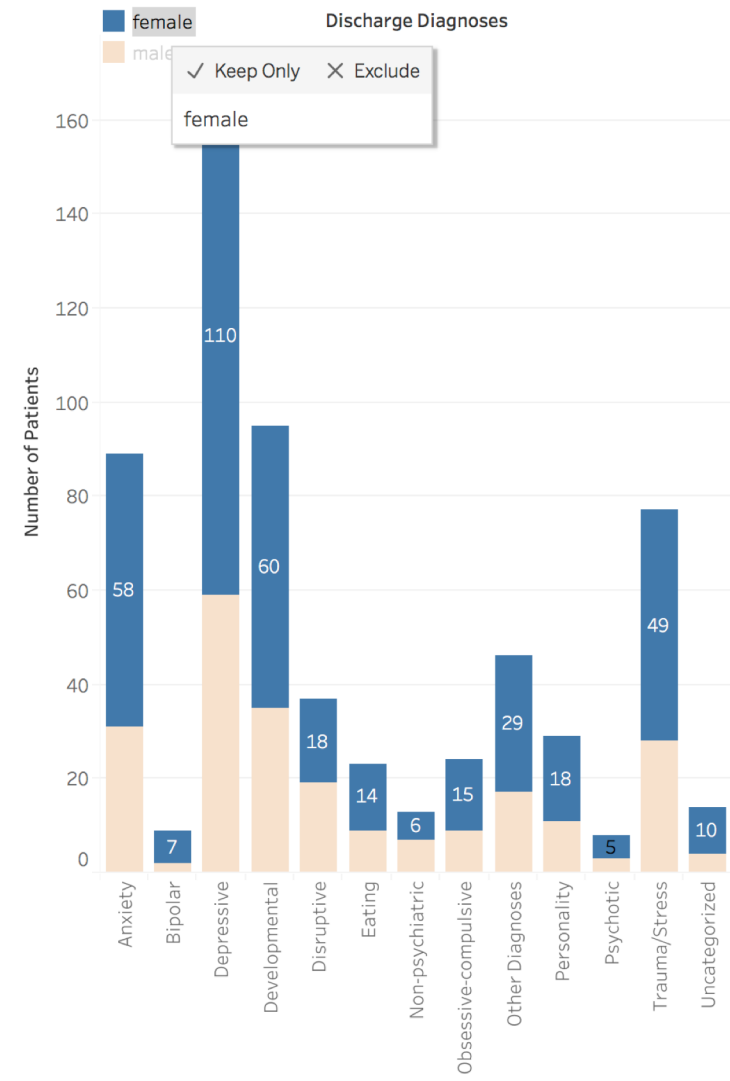
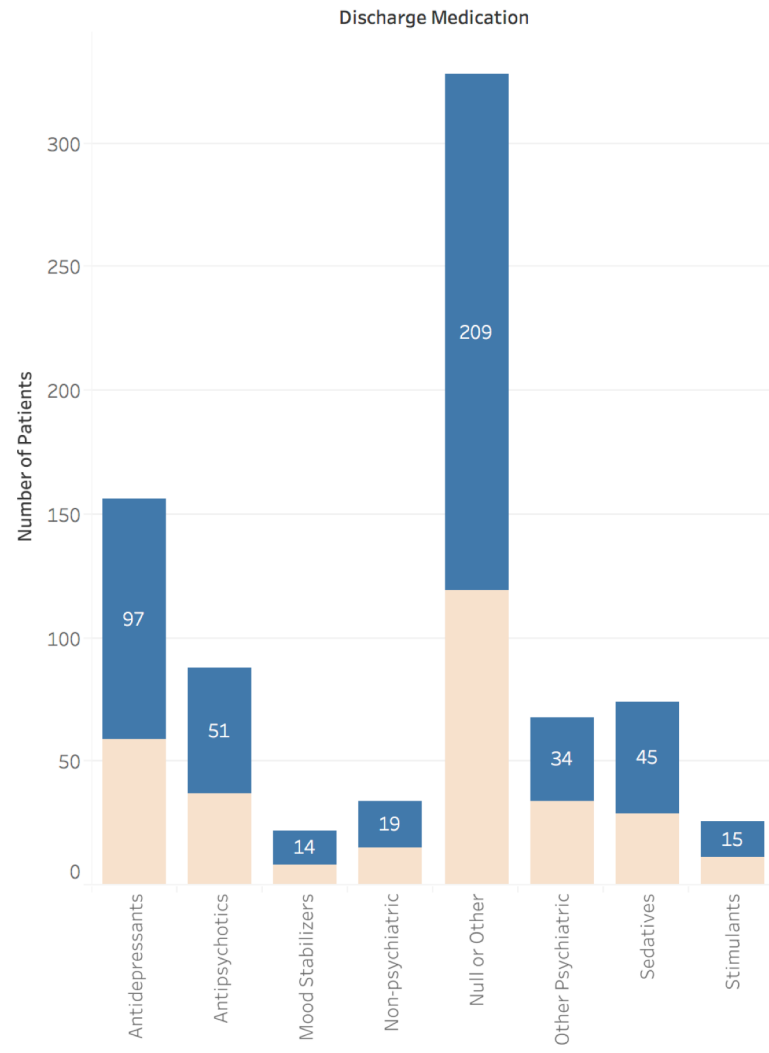
Select item  
Overview

Please select a month from Jan. to Dec.  
Jan  Dec



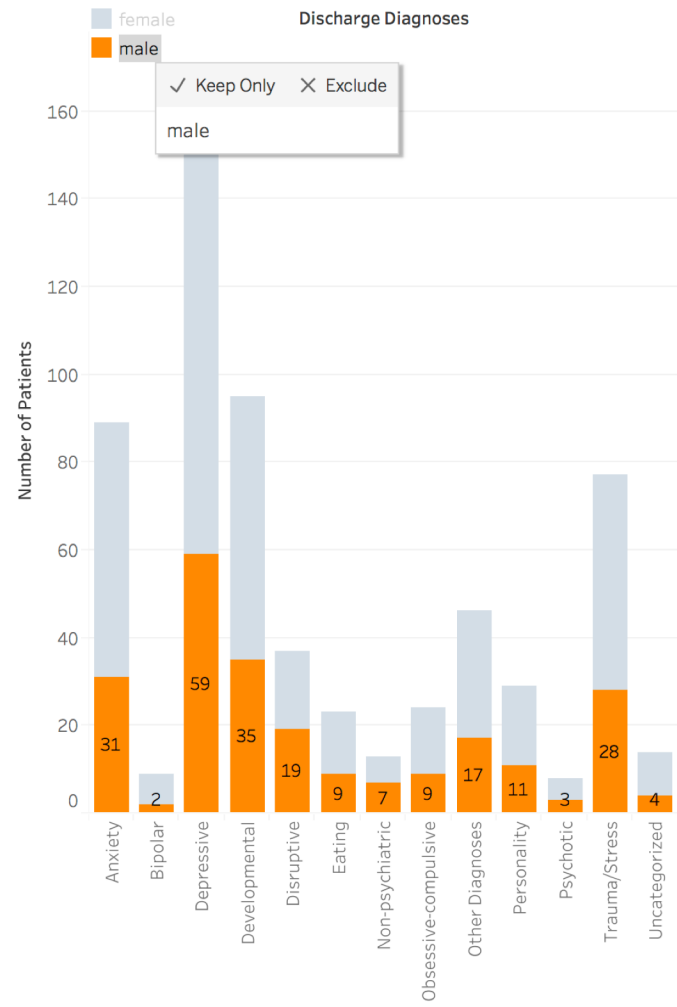
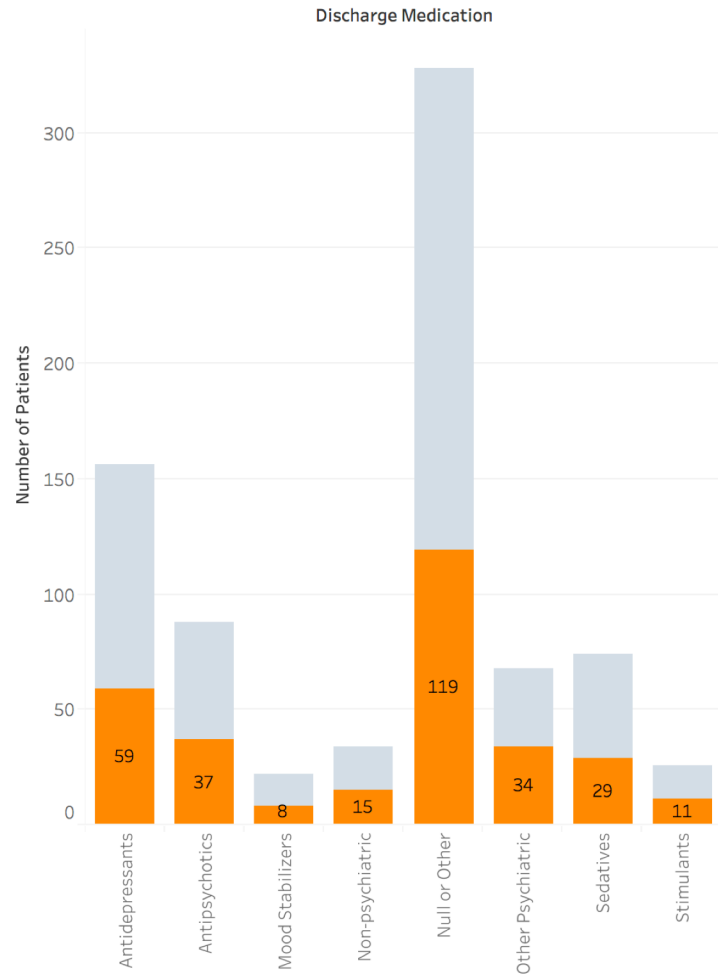
Select item  
Show by Gender

Please select a month from Jan. to Dec.  
Jan Dec



Select item  
 Show by Gender

Please select a month from Jan. to Dec.  
 Jan  Dec

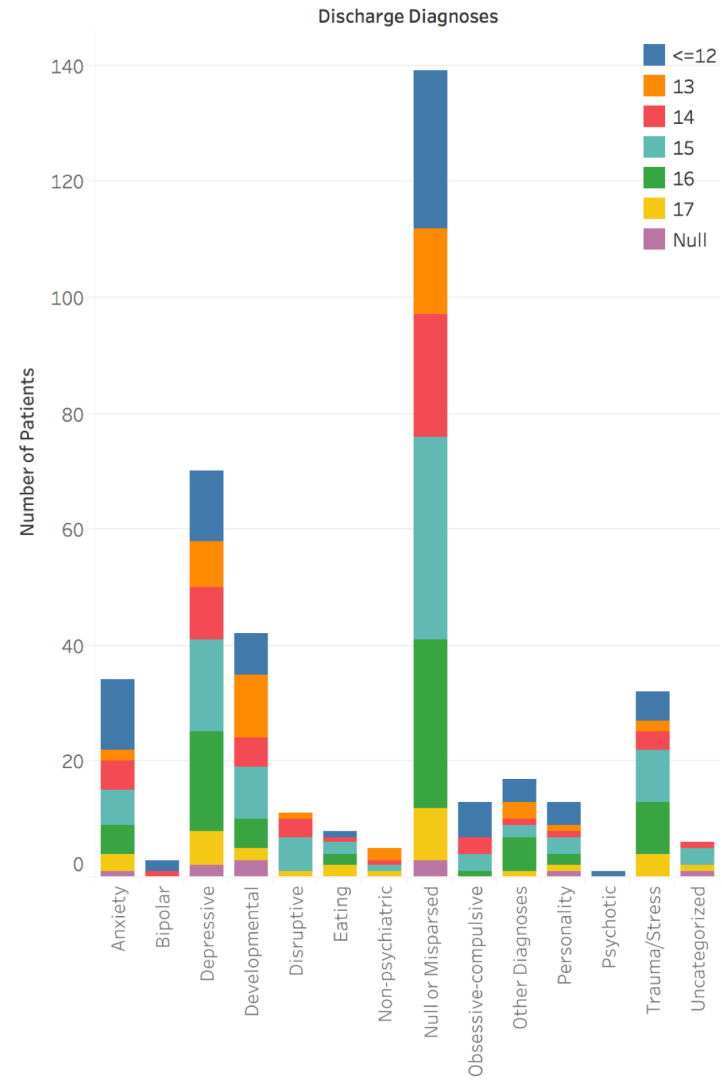
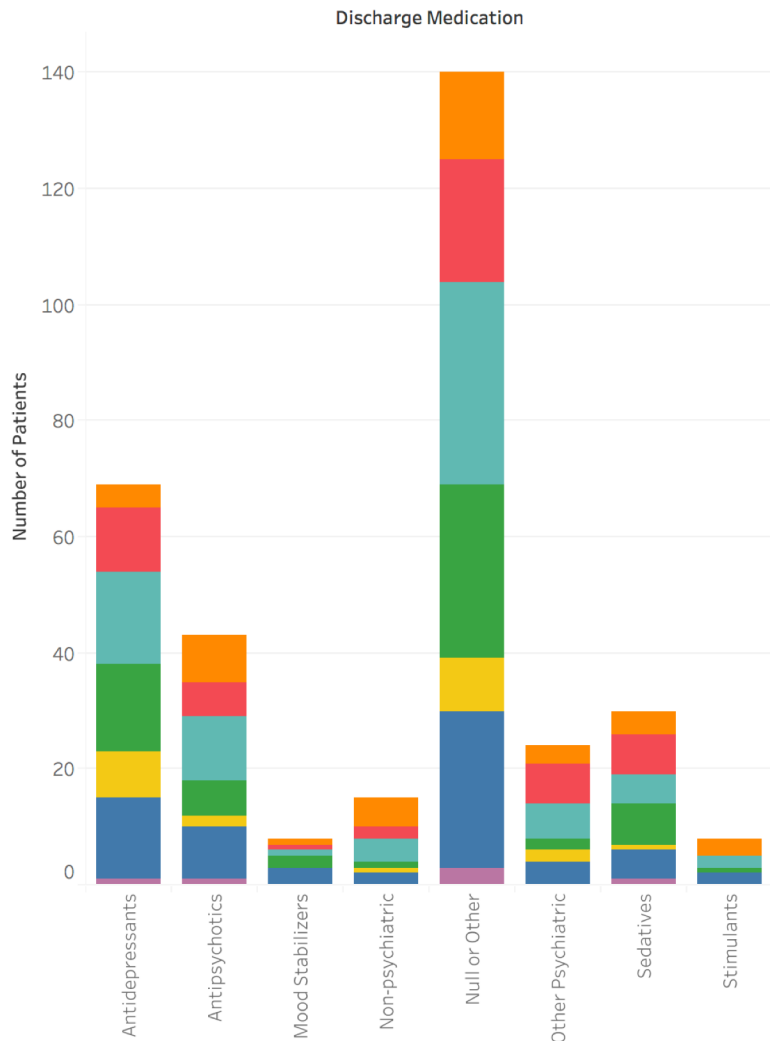


Select item

Show by Age ▾

Please select a month from Jan. to Dec.

Mar  Sep





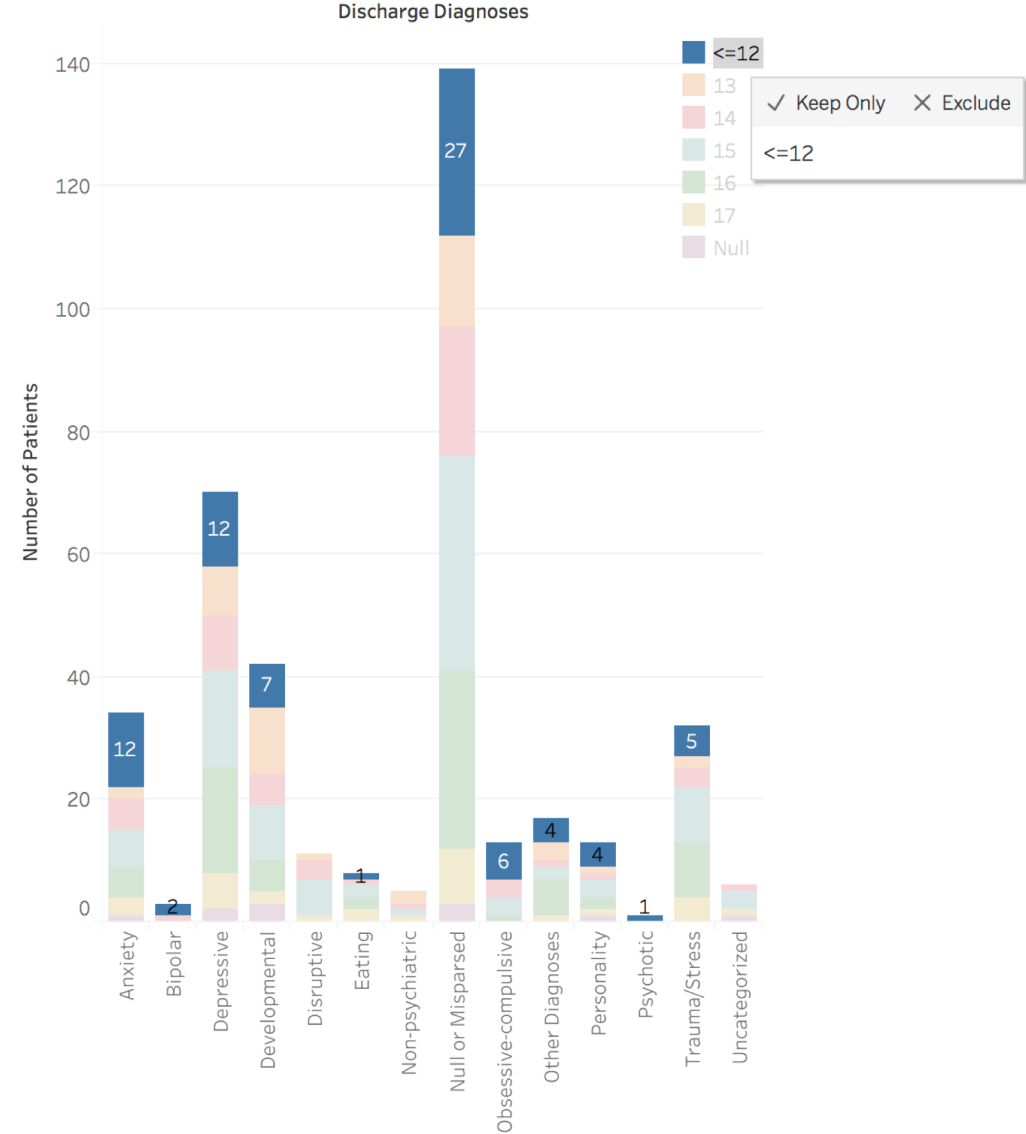
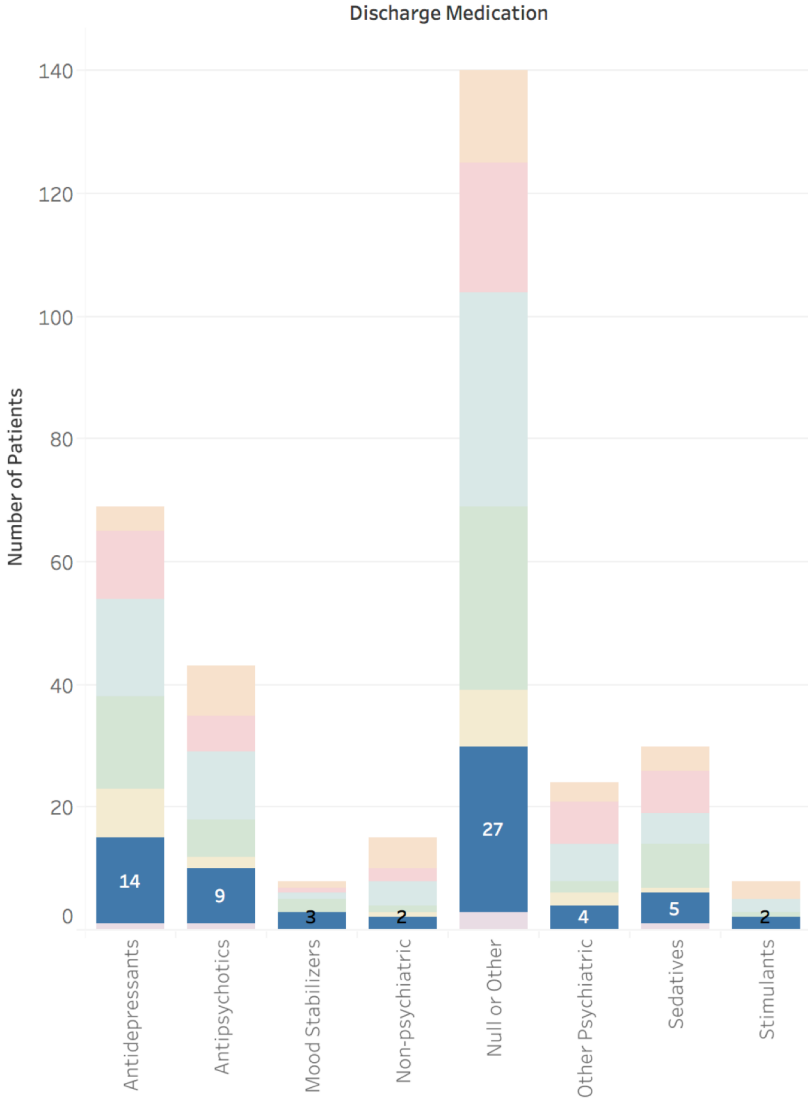
Select item

Show by Age

Please select a month from Jan. to Dec.

Mar 

 Sep

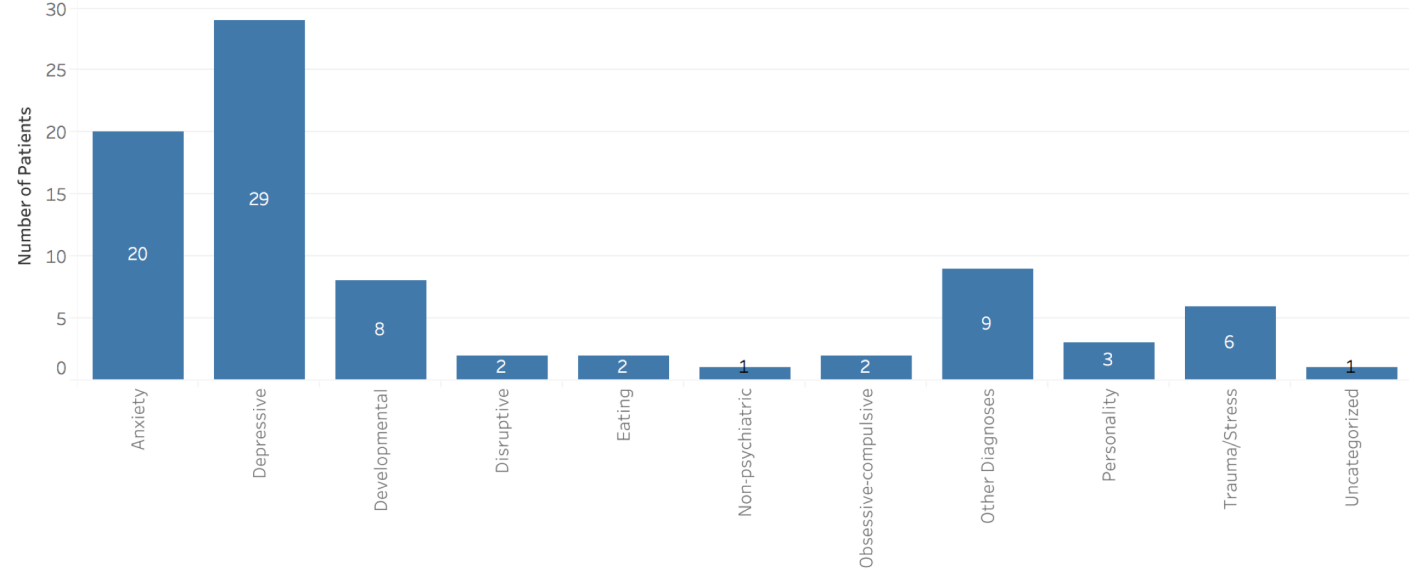


Please select one of the parameters to see the related diagnosis

Show by Substances

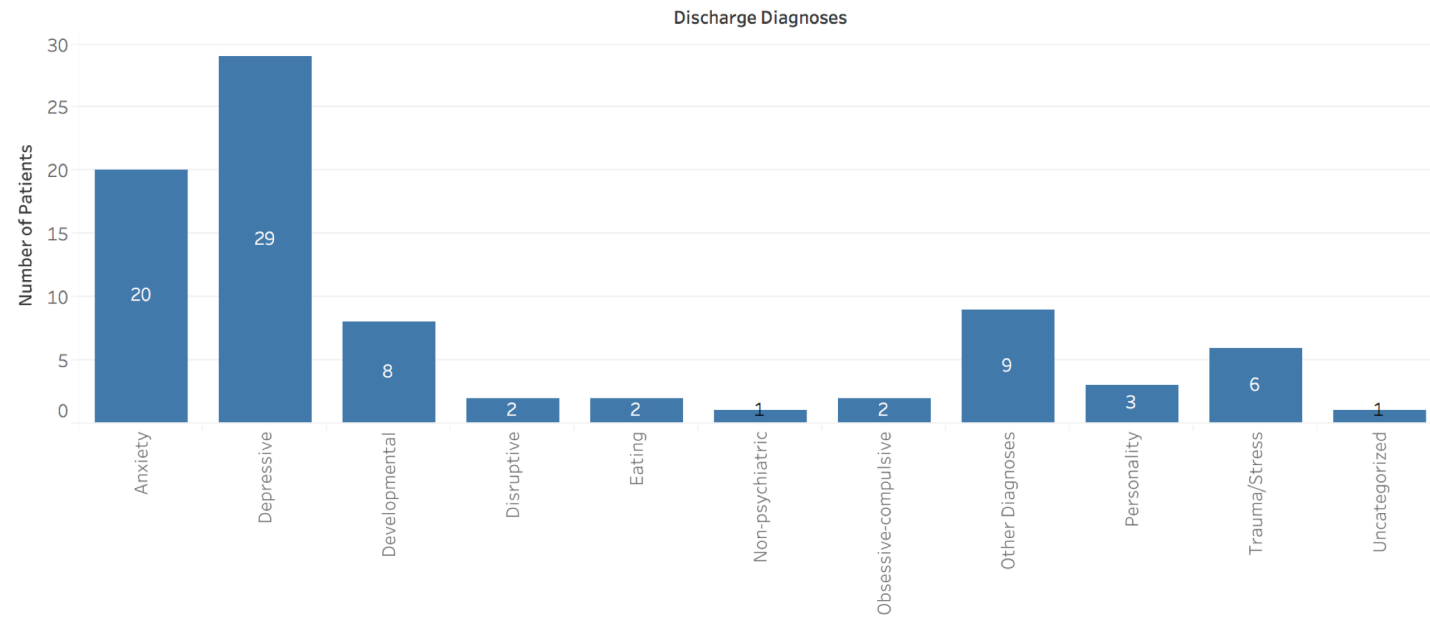
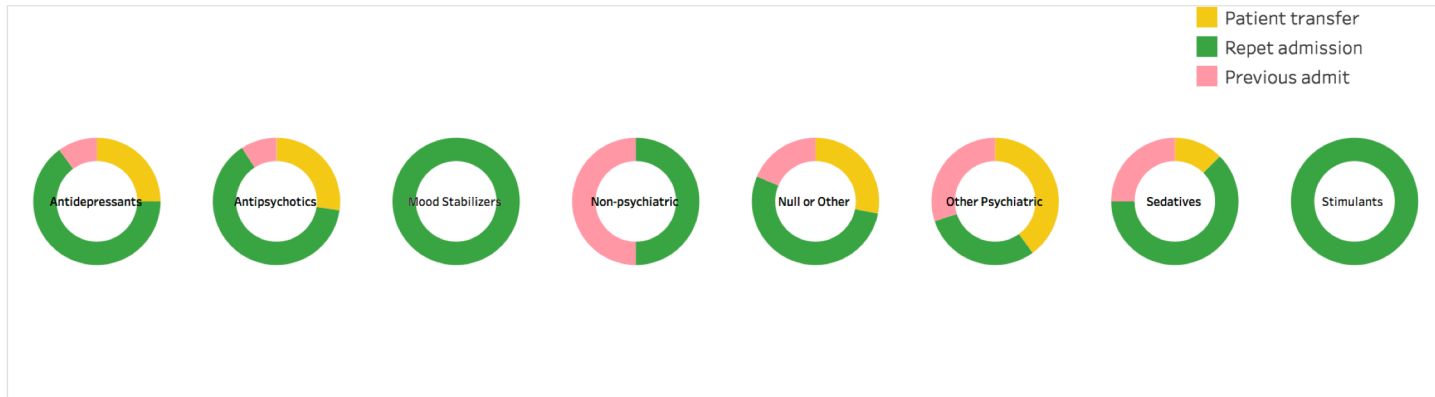


Discharge Diagnoses



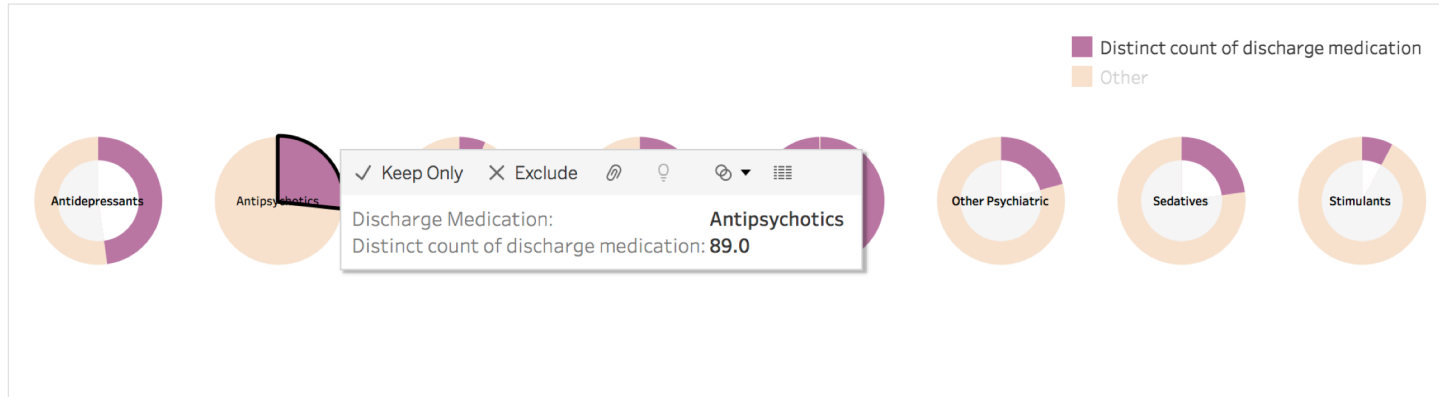
Please select one of the parameters to see the related diagnosis

Show by Hospital Info

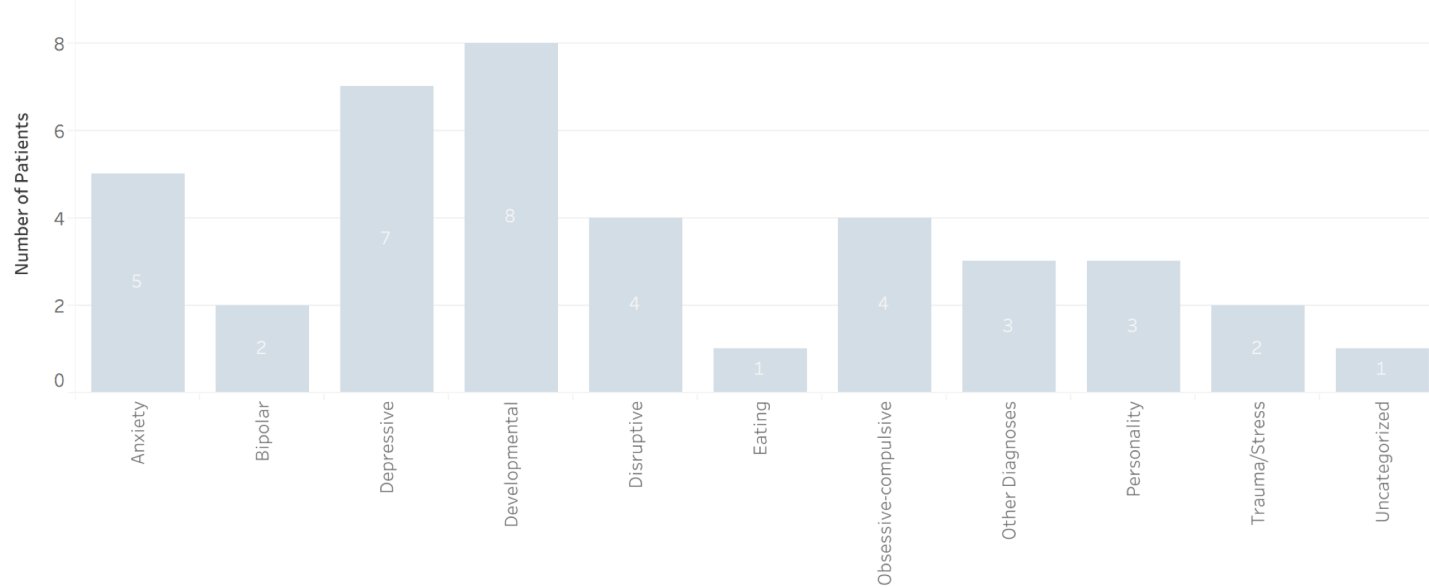


Please select one of the parameters to see the related diagnosis

Show by Medication

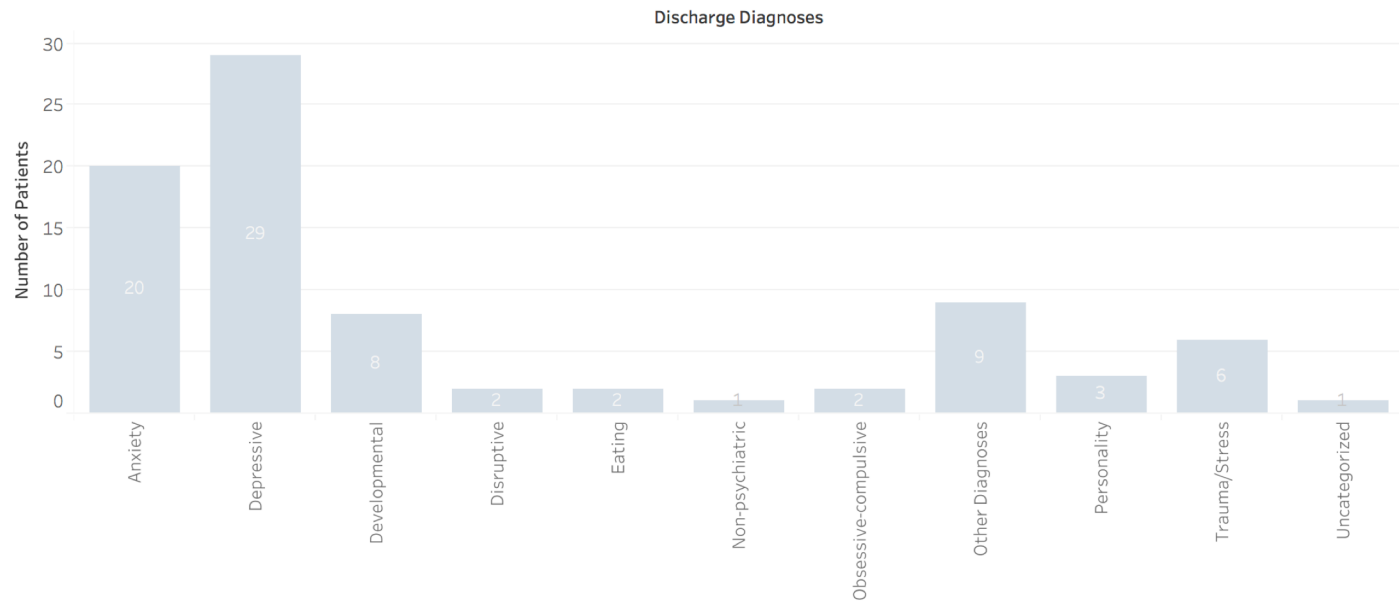
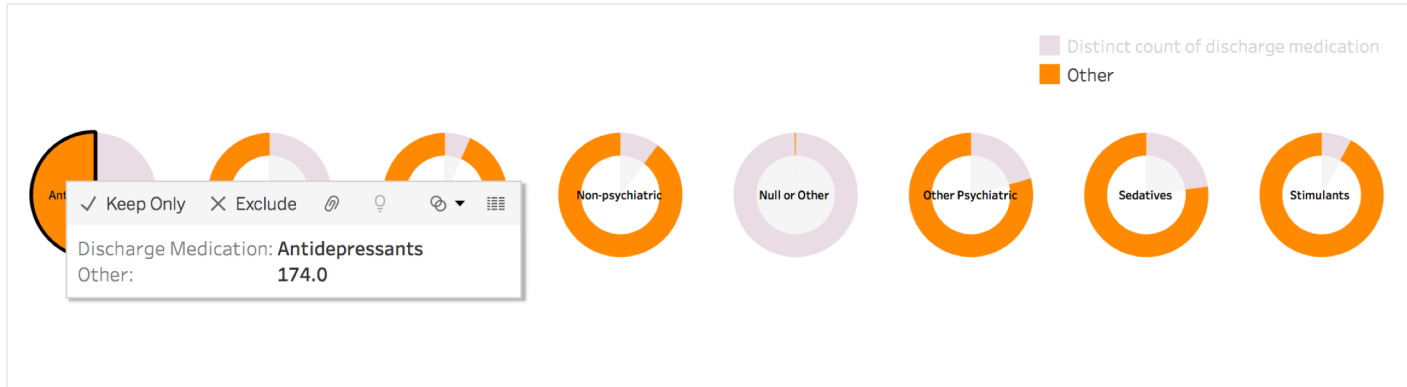


Discharge Diagnoses



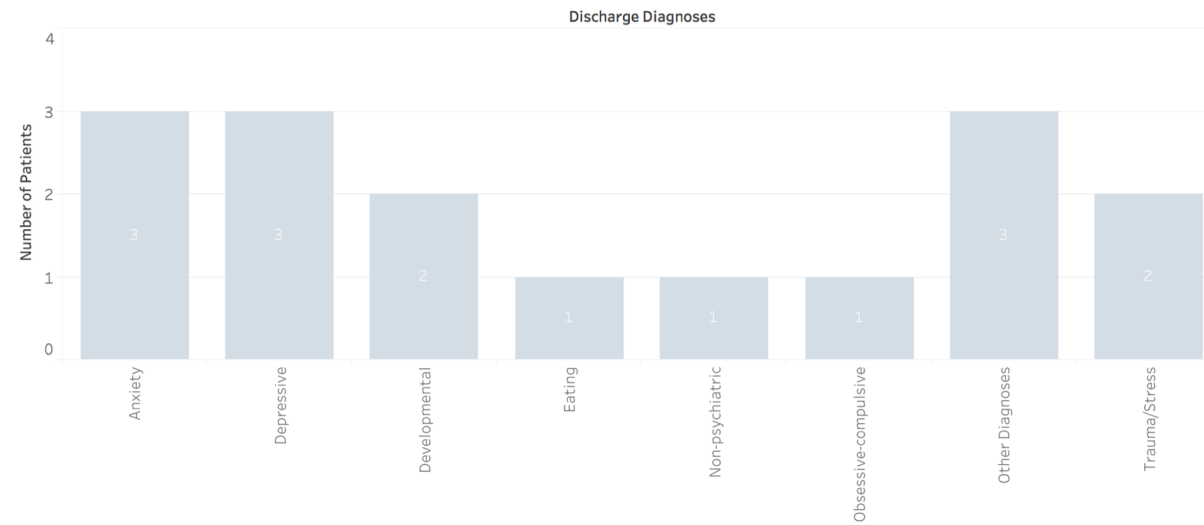
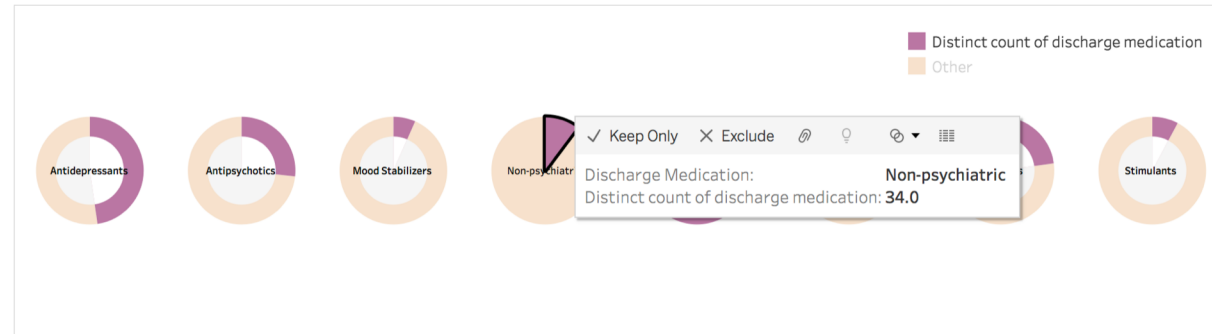
Please select one of the parameters to see the related diagnosis

Show by Medication



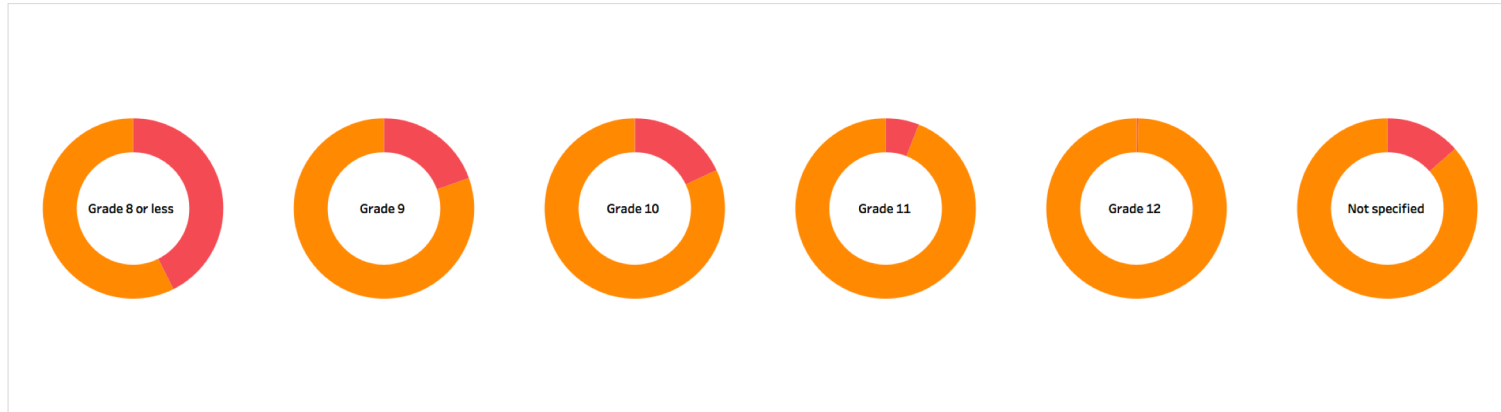
Please select one of the parameters to see the related diagnosis

Show by Medication

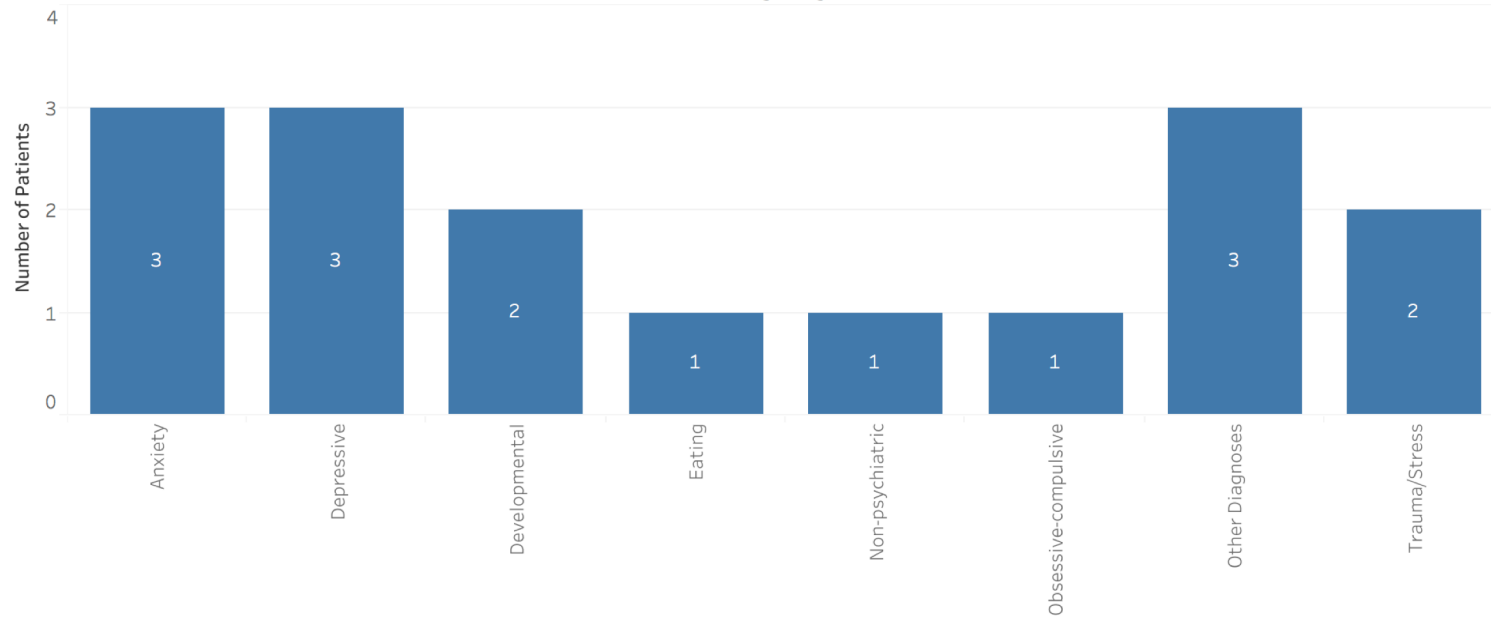


Please select one of the parameters to see the related diagnosis

Show by Education Level

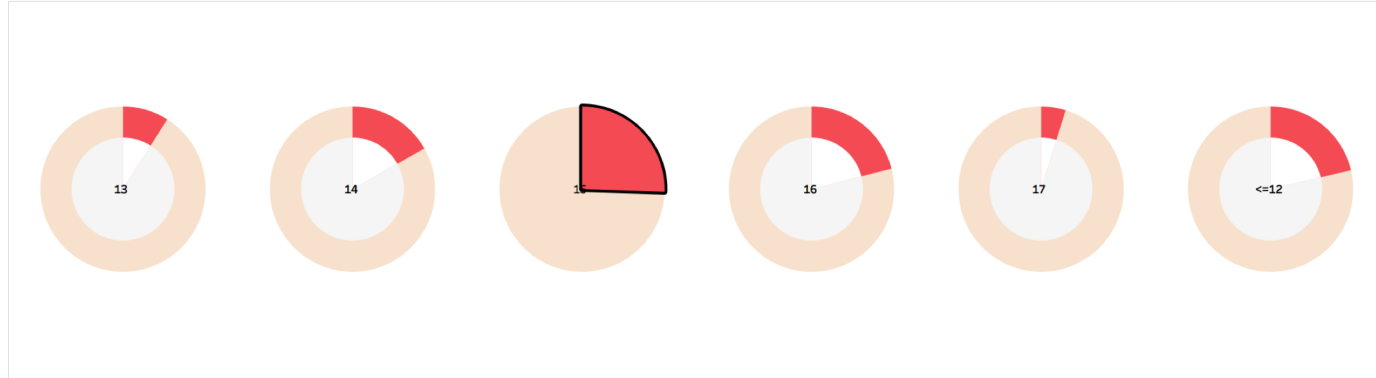


Discharge Diagnoses

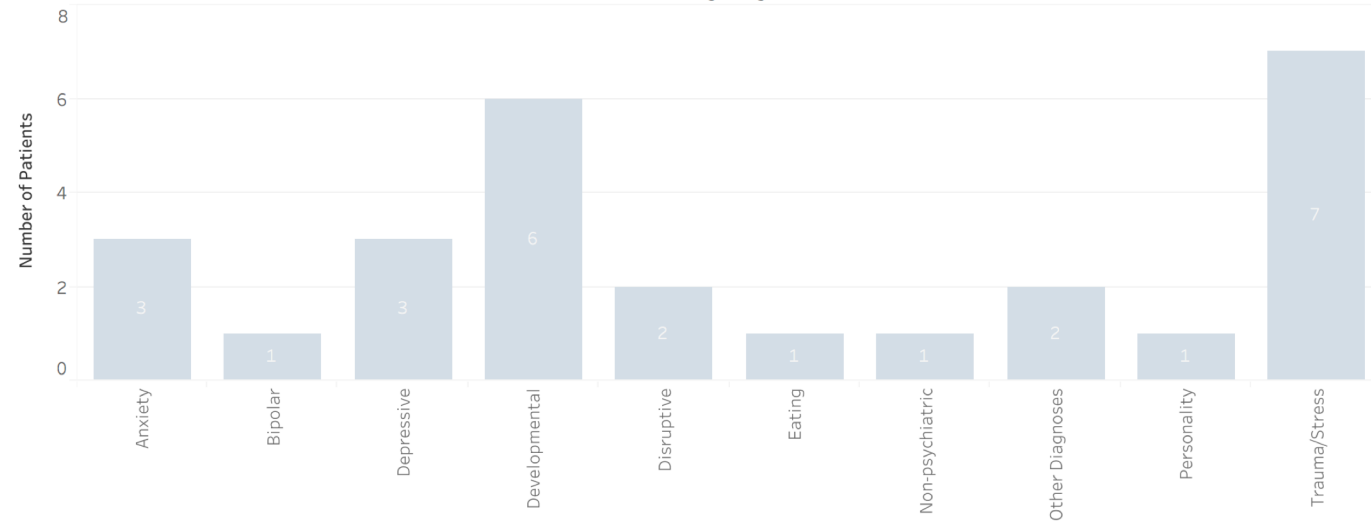


Please select one of the parameters to see the related diagnosis

Show by Age



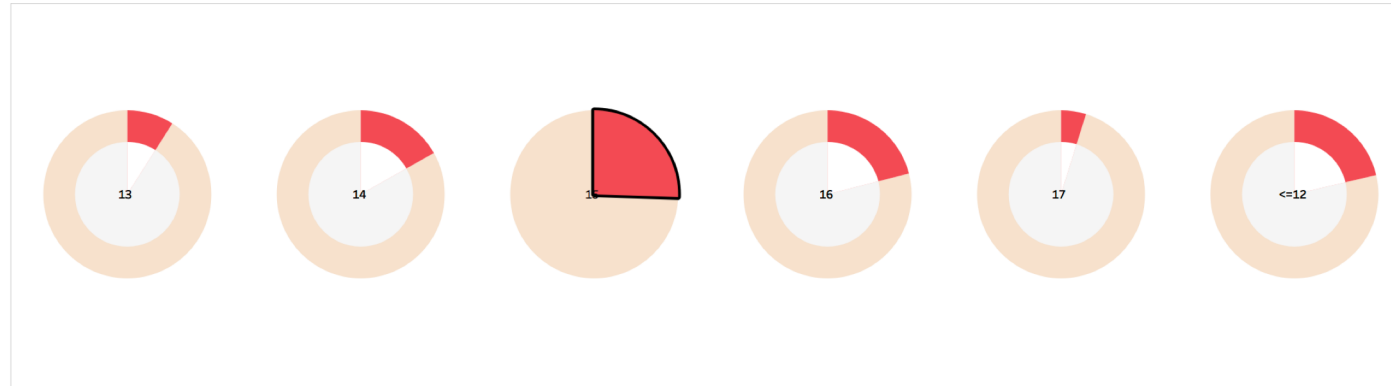
Discharge Diagnoses



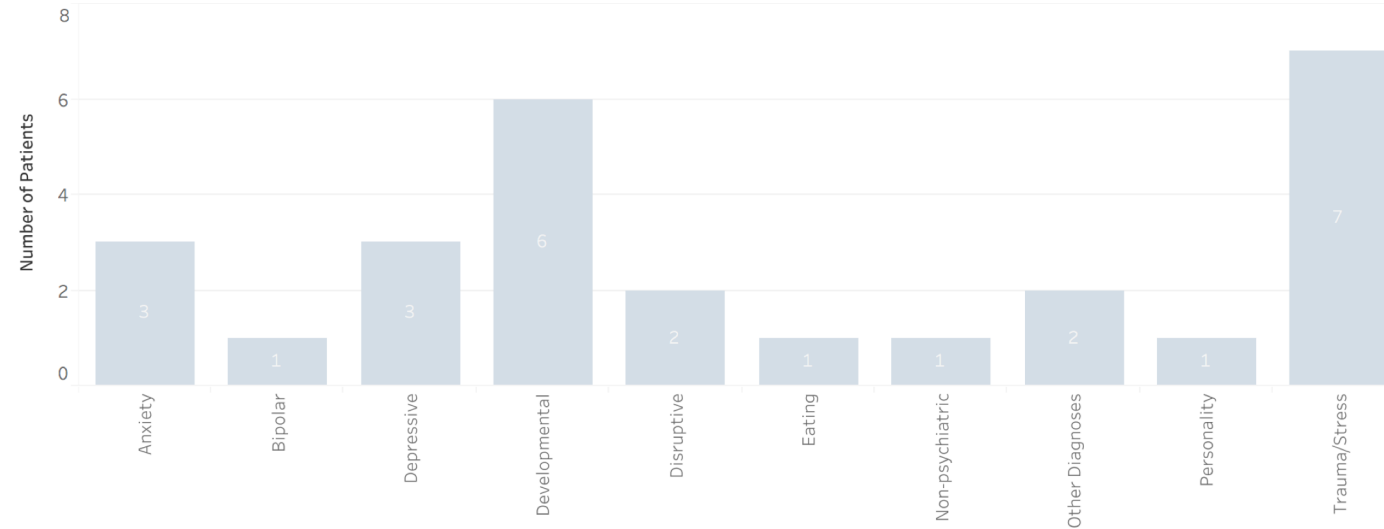


Please select one of the parameters to see the related diagnosis

Show by Age

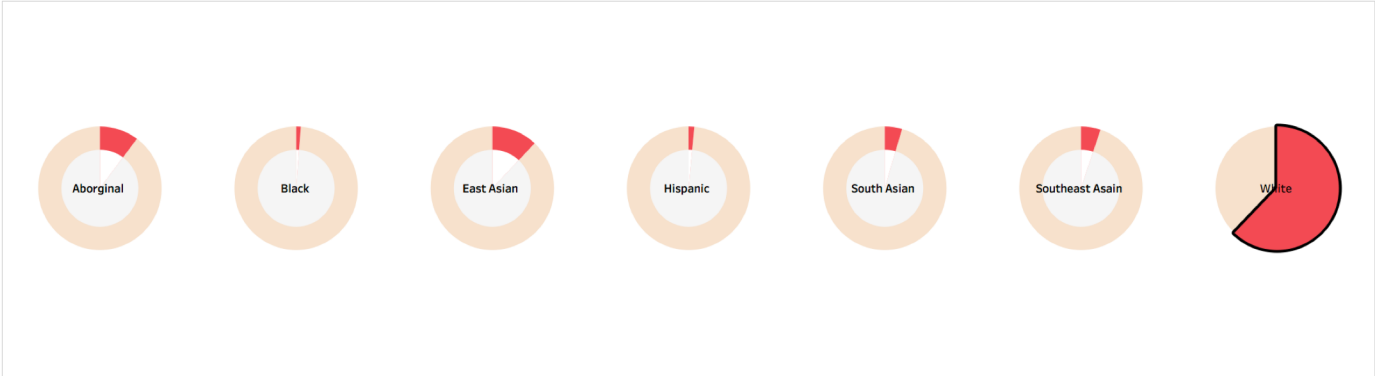


Discharge Diagnoses



Please select one of the parameters to see the related diagnosis

Show by Ethnicity



Discharge Diagnoses

