## Background
- Post-Traumatic Stress Disorder (PTSD) and Alcohol Use Disorder (AUD) commonly co-occur with estimated rates of AUD as high as 85% in treatment-seeking patient populations with PTSD.  
- Patients with comorbid PTSD and AUD experience higher rates of psychosocial, and medical problems, and higher rates of inpatient hospitalization than those with AUD alone.
- Literature investigating the effects of Selective Serotonin Reuptake Inhibitors (SSRIs) and other PTSD treatments on AUD symptoms are generally limited by small sample size and focus on alcohol consumption as opposed to outcomes related to functional status.
- Comorbidity of PTSD and AUD is common within the Veteran’s Affairs system, which provides a high rich source of administrative treatment data for analysis.
- High-dimensional propensity score adjustment (HDPSA) has emerged as an empirically useful strategy for assessing medication treatment effects using available data in most administrative healthcare databases.

## Objectives
- This study has two objectives:
  1. To serve as a pilot investigation and proof-of-concept study to determine the applicability of high dimensional propensity score adjustment (HDPSA) techniques to dual diagnosis research, specifically PTSD with comorbid AUD.
  2. To estimate SSRI treatment effects on healthcare utilization outcomes related to severity of AUD symptoms.

## Design
- This study is a quasi-experimental, population-based, pharmacoepidemiology cohort study of 4505 veterans seen at the North Texas Veterans Healthcare System between the years 2000 and 2015.
- Candidate patient records were identified from data contained within the Veteran’s Affairs Central Data Warehouse using a validated selection algorithm.  
- Variable specification and selection were conducted using a multiple-step algorithm for HDPSA designed for use with healthcare claims data.
- Six prespecified outcome measures were assessed including all-cause medical hospitalization, emergency room visits, and psychiatric admissions, and alcohol-related medical hospitalization, emergency room visits, and psychiatric admissions.
- The design and methodology of the study were approved by the North Texas Veterans Healthcare System Institutional Review Board.

## Methodology
- Following selection (see selection algorithm for detail) patients with no prior SSRI use were assessed for initiation of and SSRI within 30 days of first PTSD diagnosis.
- Within the total patient population, the prevalence of inpatient and outpatient ICD-9 diagnosis codes, inpatient and outpatient Current Procedural Terminology (CPT) codes, and inpatient and outpatient medications (by drug name) occurring within 180 days prior to first PTSD diagnosis were determined from the VA Central Data Warehouse records.
- The top 10% of each data dimension (ICD-9 codes, CPT codes and medication names) were considered as potential covariates for propensity score generation. Covariates occurring in less than 100 patients were removed from consideration.
- Multivariate bias (Bias M) was calculated based on relative risk of covariates given each outcome.
- Covariates were ranked by descending values of Log($\pi$) for each outcome.
- The top 10% of variables were selected for each distinct outcome measure.
- Demographics, service connection, and priority group status as well as the top 10% of variables determined for each outcome were used to generate propensity score reflecting odds of initiation.
- A binary logistic regression model was constructed for each outcome including percent of study period taking medication, an interaction medication possession and percent of study period taking medication, as well as SSRI treatment status and propensity score.
- IBM SPSS Statistics version 24 with FUZZY extension was used for propensity score generation and statistical analysis.

## Selection Algorithm

<table>
<thead>
<tr>
<th>Algorithm</th>
<th>Selection Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Patients Seen at the North Texas Veterans Healthcare System between 01/01/2000 and 12/31/2015</td>
<td></td>
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<tr>
<td></td>
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</tr>
<tr>
<td>Alcohol Use Disorder inclusion criteria:</td>
<td>p&lt;0.05</td>
<td>SSRI prescribed within 30 days n = 2478</td>
</tr>
<tr>
<td>p&lt;0.05</td>
<td>No SSRI prescribed within 30 days n = 2478</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Following selection (see selection algorithm for detail) patients with no prior SSRI use were considered as potential covariates for propensity score generation. Covariates occurring in less than 100 patients were removed from consideration.</td>
</tr>
</tbody>
</table>

## Results

<table>
<thead>
<tr>
<th>Odds of All-Cause and Alcohol-Related Outcomes at Two Years</th>
<th>Odds at Two Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cause Emergency Visits Aud OR=0.802 95% CI=0.681 to 0.945</td>
<td>0.681 to 0.945</td>
</tr>
<tr>
<td>Alcohol Related Emergency Visits Aud OR=0.709 to 0.798</td>
<td>0.709 to 0.798</td>
</tr>
<tr>
<td>Alcohol Related Medical Admissions Aud OR=0.617 95% CI=0.477 to 0.798</td>
<td>0.477 to 0.798</td>
</tr>
<tr>
<td>All Cause Psychiatric Admissions Aud OR=0.801 95% CI=0.743 to 0.856</td>
<td>0.743 to 0.856</td>
</tr>
</tbody>
</table>

## Conclusions/Future Directions

- A significant negative relationship was observed between dichotomized SSRI usage and all-cause emergency room visits ($p=0.008$, OR=0.802 95% CI=0.681 to 0.945).
- A significant negative relationship was observed between dichotomized SSRI usage and all-cause medical admissions ($p=0.001$, OR=0.617, 95% CI=0.477 to 0.798).
- A significant negative relationship was observed between dichotomized SSRI usage and alcohol-related medical admission ($p=0.044$, OR=0.689, 95% CI=0.480 to 0.989).

## References

- Schneeweiss S, [1], Sarah Bozeman PhD [1], Bryon Adinoff MD [1,2]  
- [1] VA North Texas Healthcare System [2] University of Texas Southwestern Medical Center