

# Characteristics Associated with Prolonged Mental Health Hospitalizations at US Children's Hospitals

Adrienne DePorre MD, Matt Hall PhD, Alec Bernstein PhD,  
Cy Nadler PhD, Henry Puls MD



**The Author Allows  
This Content To Be Shared**



# Disclosures

- **No financial conflicts of interest to disclose**

# Background

- Hospitalizations for mental health (MH) conditions at medical hospitals are increasing in frequency
- Medical hospitals often lack resources to provide effective and safe care patients for patients with MH needs
- Youth with prolonged MH hospitalizations may be at particular risk for low-value care and behavioral dysregulation

# Objectives

- **Determine patient clinical and demographic factors associated with prolonged MH hospitalizations**
- **Describe hospital variation in the prevalence of prolonged MH hospitalizations**

# Methods- Study Design

- **Retrospective study using Pediatric Health Information System Database (PHIS)**
- **Inclusion Criteria**
  - **Aged 5-20 years**
  - **Hospitalizations with a primary MH diagnosis**
  - **Jan 1, 2021- Dec 31, 2022**
- **Exclusion Criteria**
  - **Psychiatric or rehabilitation beds**
  - **Transfers from outside facilities**

# Methods- Primary Exposure

- **Primary Mental Health Diagnosis**
- **Child and Adolescent Mental Health Disorders Classification System (CAMHD-CS)**
- **ICD-10 Diagnostic Codes**  **DSM-V Psychiatric Diagnostic Groups**

# Methods- Primary Exposure

## Mental Health Categories

- ADHD
- Accidental/Undetermined Poisoning
- Anxiety Disorders
- Autism Spectrum Disorder
- Bipolar Related Disorders
- Depressive Disorders
- Developmental Delay NOS
- Disruptive, Impulse Control and Conduct Disorders
- Feeding and Eating Disorders
- Schizophrenia Spectrum and Other Psychotic Disorders
- Somatic Symptom and Related Disorders
- Substance Related Disorders
- Suicide or Self-Injury
- Trauma and Stressor-Related Disorders



# Methods- Primary Outcome

- **Prolonged MH hospitalization**
  - **Defined as length of stay  $\geq 95^{\text{th}}$ %**
  - **Equates to  $\geq 14$  days**

# Methods- Patient Characteristics

- **Age**
- **Sex**
- **Race and Ethnicity**
- **Payer**
- **Number of unique CAMHD MH categories**
- **Number of Complex Chronic Conditions**

# Methods- Statistical Analysis

- **Chi-square or Wilcoxon Rank Sum tests**
- **Multivariate models estimated adjusted odds ratios and 95% confidence intervals**
- **Significance indicated at  $p \leq 0.05$**
- **Described inter-hospital variation in the frequency of prolonged MH hospitalizations**

# Results

- 42,654 MH hospitalizations included
- 2,169 (5%) were prolonged MH hospitalizations

# Results- Cohort Characteristics

Patient Demographic Characteristics	All patients with MH hospitalizations (N=42654)
<b>Sex</b>	
Female	68.5%
Male	31.5%
<b>Race and ethnicity</b>	
Non-Hispanic White	53.8%
Non-Hispanic Black	20.2%
Hispanic	17.2%
Other/Unknown	6.7%
Asian	2.1%
<b>Payer</b>	
Government	48.4%
Private	44.7%
Other	6.9%

# Results- Cohort Characteristics

<b>Patient Clinical Characteristics</b>	<b>All patients with MH hospitalizations (N=42654)</b>
<b>Number of MH diagnostic categories</b>	
1-2	39%
3-4	44.6%
5+	16.4%
<b>Number of Complex Chronic Conditions</b>	
0	80%
1	16.6%
2	2.8%
3+	0.6%

# Results- Cohort Characteristics

<b>Primary Mental Health Category</b>	<b>All patients with MH hospitalizations (N=42654)</b>
<b>Suicide or Self-Injury</b>	<b>37.4%</b>
<b>Depressive Disorders</b>	<b>16.6%</b>
<b>Feeding and Eating Disorders</b>	<b>10.9%</b>
<b>Other</b>	<b>6.3%</b>
<b>Somatic Symptom and Related Disorders</b>	<b>5%</b>
<b>Disruptive, Impulse Control and Conduct Disorders</b>	<b>3.8%</b>
<b>Trauma and Stressor-Related Disorders</b>	<b>3.8%</b>
<b>Anxiety Disorders</b>	<b>3.3%</b>
<b>Substance related disorders</b>	<b>2.8%</b>
<b>Accidental or Undetermined Poisoning</b>	<b>2.3%</b>

# Results- Adjusted Associations

Patient Characteristic	Adjusted OR (95% CI)
<b>Race and Ethnicity</b>	
Non-Hispanic White	Referent
Non-Hispanic Black	1.69 (1.3,2.19)
Asian	1.58 (1.13,2.2)
Other	1.59 (1.12,2.26)
Hispanic	n/a ( not significant)
<b>Number of unique MH Categories</b>	
1-2	Referent
3-4	1.6 (1.3,1.97)
5+	3.72 (2.89,4.79)
<b>Number of Complex Chronic Conditions</b>	
0	Referent
1	1.58 (1.33,1.89)
2	2.22 (1.59,3.11)
3+	6.16 (3.82,9.93)



# Results- Adjusted Associations

Mental Health Condition	Adjusted OR (95% CI)
<b>Anxiety Disorders</b>	<b>REFERENCE</b>
<b>Feeding and Eating Disorders</b>	<b>24.81 (8.11,75.89)</b>
<b>Schizophrenia Spectrum and Other Psychotic Disorders</b>	<b>10.63 (4.2,26.89)</b>
<b>Autism Spectrum Disorder</b>	<b>7.07 (2.7,18.48)</b>
<b>Disruptive, Impulse Control and Conduct Disorders</b>	<b>6.78 (2.43,18.92)</b>
<b>Bipolar and Related Disorders</b>	<b>4.26 (2.03,8.97)</b>
<b>ADHD</b>	<b>3.18 (1.42,7.13)</b>
<b>Depressive Disorders</b>	<b>2.89 (1.5,5.56)</b>

# Results

## **Mental Health Conditions NOT Associated with Prolonged Hospitalizations**

**Suicide or Self-Injury**

**Somatic Symptom and Related Disorders**

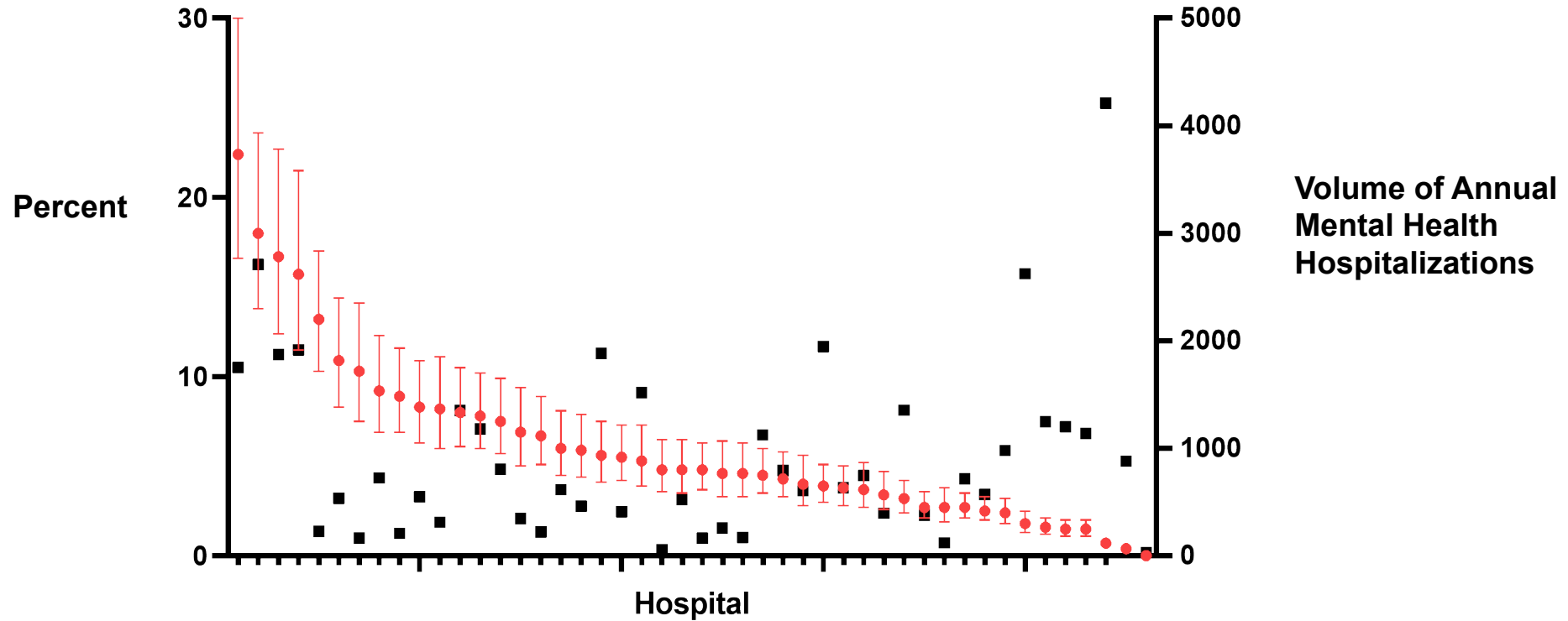
**Trauma and Stressor-Related Disorders**

**Substance Related disorders**

**Accidental or Undetermined Poisoning**

**Developmental Delay NOS**

# Results-Interhospital Variation



- Risk Adjusted Percent of Mental Health Hospitalizations with 14+ Days LOS
- Volume of Mental Health Hospitalizations

# Limitations

- **Data set limitations**
  - **Some mediators not captured using PHIS**
  - **Accuracy of coding**
- **Results may not generalize to non-Childrens hospitals**

# Implications

## Racial disparities in mental health care

- May reflect disparities in care pre-hospital and/or within the hospital setting
- May be real or perceived race-associated barriers in post-hospital care

## Type of MH category were associated with prolonged LOS

- Categories with strongest associations often require unique systems of care, including specialized regional and hospital resources

## Wide variation in prevalence of prolonged MH hospitalizations

- After controlling for volume, type of MH conditions seen

# Implications- Next Steps

## Racial disparities in mental health care

- Explore the influence of pre-hospital and hospital factors contributing to racial disparities

## Type of MH category were associated with prolonged LOS

- Compare practice patterns and clinical outcomes of patients with prolonged vs. non-prolonged MH hospitalizations

## Wide variation in prevalence of prolonged MH hospitalizations

- Test associations between regional and hospital level MH resources with prolonged MH hospitalizations.

# Thank You



Contact Adrienne DePorre with questions: [adeporre@cmh.edu](mailto:adeporre@cmh.edu)