CENTER FOR HEALTH INFORMATION AND ANALYSIS

BEHAVIORAL HEALTH & READMISSIONS

IN MASSACHUSETTS ACUTE CARE HOSPITALS

TECHNICAL APPENDIX

AUGUST 2016

CHIA.

Behavioral Health and Readmissions in Massachusetts Acute Care Hospitals (August 2016)

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Introduction

This Technical Appendix provides an overview of the data source and analytic methods that were used in the report, Behavioral Health and Readmissions in Massachusetts Acute Care Hospitals (August 2016), by the Center for Health Information and Analysis (CHIA).

The aforementioned publication reports on the prevalence of behavioral health comorbidities and readmission rates among hospitalized patients in Massachusetts acute care hospitals on an all-payer, all-condition basis.

Data Source

For this report, the Hospital Inpatient Discharge Database (HDD) of CHIA's Acute Hospital Case Mix Database was used as the source data. This case mix discharge dataset is a stay-level file including patient socio-demographics, diagnostic information, treatment and service information, and hospital charges. The data is submitted to CHIA quarterly by all Massachusetts acute care hospitals, and undergoes a cleaning and verification process at CHIA that includes the feedback of verification reports to hospitals for confirmation of their information. Once quarterly data has been processed and verified, CHIA produces and makes available annual files.

Study Population

The study population is adult patients (age 18+) who were discharged from Massachusetts acute care hospitals from July 1, 2013 to June 30, 2014 (SFY 2014). Discharges from Massachusetts psychiatric hospitals were not included in this study.

After applying a revised exclusion criteria of the Yale/CMS readmissions methodology (for details, see Appendix A: Readmissions Methodology in CHIA's Hospital-wide Adult All-Payer Readmissions in Massachusetts: 2011-2014), a total of 347,747 unique patients, representing 515,353 eligible index admissions and 79,826 readmissions, were included in the analytic dataset. The revised exclusion criteria include the following: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. Primary psychiatric admissions were excluded in the Yale/CMS readmissions methodology but included in the analysis for this study.

Behavioral health admissions accounted for 10% of eligible index admissions and 12% of readmissions in this dataset.

Unit of Analysis

With the exception of the analysis by discharge setting, the unit of analysis for this study is the patient. In the discharge setting analysis, it is more precise to calculate prevalence and readmission rates at the discharge level because discharge setting can vary from visit to visit for the same patient.

For patients' age, sex, region of residence, and payer type, the values were taken from the most recent visit in the discharge analytic dataset. Patient level behavioral health indicators were calculated from among all visits in the study period. That is, a patient could be classified with a behavioral health indicator from only one occurrence of such indicator in any one discharge record.

Behavioral Health Comorbidity

To examine the prevalence of behavioral health comorbidity among hospitalized patients, CHIA categorized patients into behavioral health groups using a modified classification methodology developed by the Agency for Healthcare Research and Quality[1] (AHRQ). Both primary and secondary diagnoses across all discharges for patients within the one-year study period were used to group patients into four mutually exclusive categories:

- Mental health disorders (MD) only
- Substance use disorders (SUD) only
- Both MD and SUD or co-occurring disorders (COD)
- No mention of MD or SUD (None)

The Clinical Classifications Software (CCS), a diagnosis and procedure categorization scheme[2] based on ICD-9-CM was used to define mental disorders. ICD-9-CM codes were used to define substance use disorders. The detailed CCS categories and ICD-9-CM diagnosis codes used in the categorization are listed in Table 1 and 2 respectively.

Table 1. Mental Disorder Classification

CCS CODE	DESCRIPTION
650	Adjustment disorders
651	Anxiety disorders
652	Attention-deficit, conduct, and disruptive behavior disorders
655	Disorders usually diagnosed in infancy, childhood, or adolescence
656	Impulse control disorders
657	Mood disorders
658	Personality disorders
659	Schizophrenia and other psychotic disorders
662	Suicide and intentional self-inflicted injury
670	Miscellaneous disorders

Source: Hospitalizations Involving Mental and Substance Use Disorders among Adults, 2012 (AHRQ HCUP Statistical Brief #191)

[1] Heslin KC (AHRQ), Elixhauser A (AHRQ), Steiner CA (AHRQ). Hospitalizations Involving Mental and Substance Use Disorders among Adults, 2012. HCUP Statistical Brief #191. June 2015. Rockville, MD: Agency for Healthcare Research and Quality. Available from http://www.hcup-us.ahrq.gov/reports/statbriefs/sb191-Hospitalization-Mental-Substance-Use-Disorders-2012.pdf

[2] HCUP CCS Fact Sheet. Healthcare Cost and Utilization Project (HCUP). January 2012. Rockville, MD: Agency for Healthcare Research and Quality. Available from www.hcup-us.ahrq.gov/toolssoftware/ccs/ccsfactsheet.jsp

Table 2. Substance Use Disorder Classification

ICD-9-CM DIAGNOSIS CODES	DESCRIPTION
291.0	Alcohol withdrawal delirium
291.1	Alcohol-induced persisting amnestic disorder
291.2	Alcohol-induced persisting dementia
291.3	Alcohol-induced psychotic disorder with hallucinations
291.4	Idiosyncratic alcohol intoxication
291.5	Alcohol-induced psychotic disorder with delusions
291.8	Other specified alcohol-induced mental disorders
291.81	Alcohol withdrawal
291.82	Alcohol-induced sleep disorders
291.89	Other alcohol-induced disorders
291.9	Unspecified alcohol-induced mental disorders
303.00–303.03	Acute alcohol intoxication
303.90–303.93	Other and unspecified alcohol dependence
305.00–305.03	Alcohol abuse
357.5	Alcoholic polyneuropathy
425.5	Alcoholic cardiomyopathy
535.30,535.31	Alcoholic gastritis
571.0	Alcoholic fatty liver
571.1	Acute alcoholic hepatitis
571.2	Alcoholic Cirrhosis of Liver
571.3	Alcoholic liver damage, unspecified
E860.0	Alcoholic beverages poisoning
304.40–304.43	Amphetamines dependence
305.70–305.73	Nondependent amphetamine abuse
304.30–304.33	Cannabis dependence
305.20–305.23	Nondependent cannabis abuse
304.20–304.23	Cocaine dependence
305.60–305.63	Nondependent cocaine abuse
968.5	Poisoning by cocaine
E938.5	Cocaine, adverse effects
292.0	Drug withdrawal
292.11	Drug-induced psychotic disorder with delusions
292.12	Drug-induced psychotic disorder with hallucinations

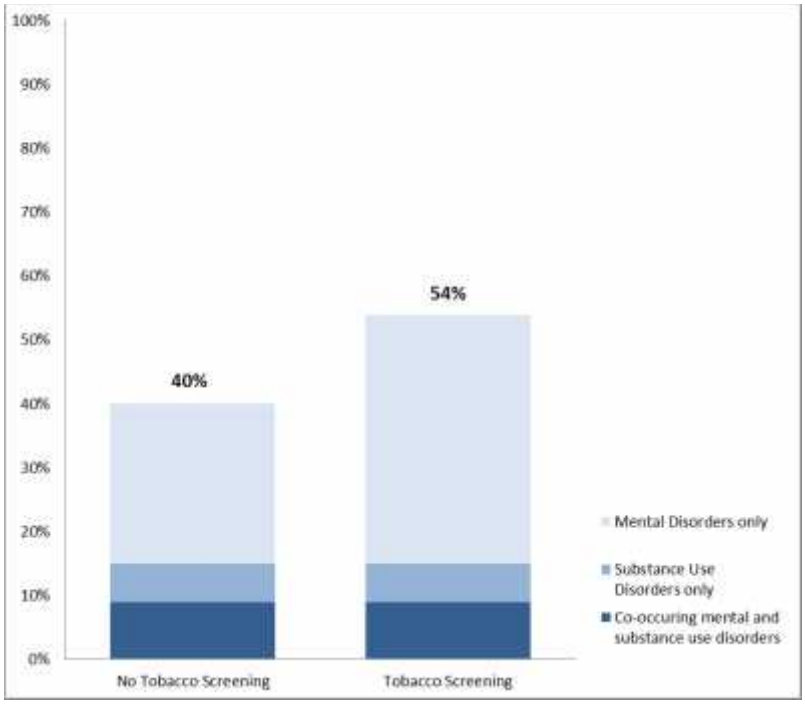
ICD-9-CM DIAGNOSIS CODES	DESCRIPTION
292.2	Pathological drug intoxication
292.81	Drug-induced delirium
292.82	Drug-induced persistent dementia
292.83	Drug-induced persistent amnestic disorder
292.84	Drug-induced mood disorder
292.85	Drug-induced sleep disorders
292.89	Other drug-induced mental disorder
292.9	Unspecified drug-induced mental disorder
304.50–304.53	Hallucinogen dependence
305.30–305.33	Nondependent hallucinogen abuse
969.6	Poisoning by hallucinogens (psychodysleptics)
E854.1	Accidental poisoning by hallucinogens (psychodysleptics)
E939.6	Hallucinogens, adverse effects
304.00–304.03	Opioid type dependence
304.70–304.73	Combinations of opioids with any other
305.50–305.53	Nondependent opioid abuse
965.00	Poisoning by opium
965.01	Poisoning by heroin
965.02	Poisoning by methadone
965.09	Poisoning by other opiates and related narcotics
E850.0	Heroin poisoning
E935.0	Heroin, adverse effects
304.10–304.13	Sedatives, hypnotics, or anxiolytic dependence
305.40–305.43	Nondependent sedative, hypnotic, or anxiolytic abuse
304.60–304.63	Other, specified drug dependence
304.80–304.83	Combinations excluding opioids
304.90–304.93	Unspecified drug dependence
305.90–305.93	Other, Mixed or Unspecified Drug Abuse
648.30–648.34	Diabetes related to drug dependence
V654.2	Counseling, substance use

Source: Hospitalizations Involving Mental and Substance Use Disorders among Adults, 2012 (AHRQ HCUP Statistical Brief #191)

As noted by AHRQ, although dementia (CCS=653) and intellectual disability/development disorders (CCS=654) are listed in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, these diagnoses frequently require more medical than psychiatric treatment because the development of these multiple cognitive impairments oftentimes are related to medical conditions. As such, these two types of conditions are not classified as mental disorders in this analysis.

Although screening and history of mental health and substance use codes (CCS=663) is included in AHRQ's classification of mental disorders, this CCS category is not included as a mental disorder in this analysis based on CHIA's further analysis of the HDD data and consultation with experts in the field. The majority of diagnosis codes in this category are related to tobacco screening. Although tobacco use represents an important public health and personal health issue, we excluded the screening codes from analysis for the purposes of describing the prevalence of comorbid behavioral health conditions among adult hospitalized population in Massachusetts. With the inclusion of tobacco screening, the prevalence of behavioral health comorbidity among patients in Massachusetts acute care hospitals increased from 40% to 54% (Figure 1).

Figure 1. Prevalence of Behavioral Health Comorbidity and Tobacco Screening



Readmission Methodology

For this report, CHIA amended the readmission methodology from CHIA's annual readmission report published in February 2016, Hospital-wide Adult All-Payer Readmissions in Massachusetts: 2011-2014 to include psychiatric admissions. Admissions for obstetric care, cancer treatment, and rehabilitation care were similarly excluded. For full specification on the readmission methodology, please see Appendix A: Readmissions Methodology in the annual readmission report.

For more information, please contact:

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