

**Behavioral Health
& Readmissions
in Massachusetts
Acute Care
Hospitals**

SFY 2018

October 2020



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Executive Summary

Until recently, medical or surgical conditions have been the primary focus of hospital readmission reduction efforts, with less attention paid to patients' behavioral health conditions.^{1,2} A growing body of evidence indicates that patients with comorbid behavioral health conditions are at higher than average risk for readmissions,^{3,4} and that behavioral health comorbidity is associated with high hospital utilization and cost.^{5,6} This emphasizes the importance of addressing behavioral health as a component of readmission reduction interventions in health care settings.^{7,8} Efforts aimed at reducing avoidable readmissions may be improved by recognizing comorbid behavioral health conditions as contributors to readmission risk.

This report provides an updated analysis of the prevalence and readmission patterns for individuals with comorbid behavioral health conditions discharged

from Massachusetts acute care hospitals. Using CHIA's hospital inpatient discharge data, this report examines both the prevalence of behavioral health comorbidity and readmission rates of adult patients with comorbid behavioral health conditions hospitalized between July 1, 2017 and June 30, 2018. This is the third such report in this series, updating findings from previous reports on State Fiscal Year (SFY) 2016 and 2017. New analyses in this report explore associations between the presence of any behavioral health comorbidity and inpatient hospital length of stay among top discharge diagnoses. This information will assist stakeholders in efforts to improve care for patients with behavioral health comorbidities and present opportunities to reduce the risk of readmission for patients with these conditions.

This report finds important differences in the prevalence of behavioral health comorbidity by payer type, age, and

region, and differences in readmission rates for patients with and without comorbid behavioral health conditions. Among patients in acute care hospitals, Medicaid adults were more likely than Medicare adults and commercially insured adults to have any behavioral health comorbidity. Relative to hospitalized patients aged 75 or older, patients aged 18-44 had nearly twice the prevalence of comorbid behavioral health conditions. Patients with comorbid behavioral health conditions had inpatient stays that were on average 1.4 days longer and had readmission rates that were 94% higher than those without a comorbid behavioral health condition. Hospitalized patients with comorbid co-occurring mental health conditions and substance use disorders had the highest readmission rates among all patients with behavioral health conditions. Among top discharge diagnoses, the presence of behavioral health comorbidity was associated with a higher readmission rate for each diagnosis.

As the COVID-19 pandemic progresses, it continues to affect all aspects of the health care system, and it

is critically important to understand the impacts of the pandemic on behavioral health care needs and services.⁹ CHIA continues to monitor these developments to better understand how patients with behavioral health comorbidities may be impacted by the COVID-19 pandemic. While this report uses data collected prior to the advent of the current pandemic, it provides key baseline estimates of the prevalence of behavioral health comorbidities for the hospitalized adult population in Massachusetts, as well as their association with hospital length of stay and readmission risk in the pre-pandemic period. Insights from this report may help to inform efforts to strengthen health care for this vulnerable population and to better target interventions throughout this critical period.

For questions regarding this report, please contact Christine Loveridge, Associate Research Manager, at Christine.Loveridge@State.MA.US. ■

Key Findings

- Forty-five percent (45%) of adults hospitalized in Massachusetts acute care hospitals had at least one comorbid behavioral health condition in SFY 2018 (July 1, 2017-June 30, 2018).
- Over sixty percent (62%) of hospitalized adult Medicaid patients had a comorbid behavioral health condition.
- Anxiety disorders and mood disorders had the highest prevalence of any comorbid mental health condition, at 26% and 25%, respectively.
- Alcohol- and opioid-related disorders had the highest prevalence of any comorbid substance use disorder, at 9% and 6%, respectively.
- Patients with any behavioral health comorbidity had inpatient stays that were, on average, 1.4 days longer than patients with no behavioral health comorbidity (5.7 days vs. 4.3 days).
- Readmission rates for patients with any behavioral health comorbidity were nearly double the readmission rates for patients without a comorbid behavioral health condition (20.4% vs. 10.5%).
- Medicaid patients with comorbid co-occurring mental health and substance use conditions had readmission rates more than three times higher than those with no behavioral health comorbidity (25.8% vs. 7.9%).
- Patients aged 18-44 with comorbid behavioral health conditions had readmission rates three times higher than those with no behavioral health comorbidity (17.1% vs. 5.7%). ■

Introduction

Reducing avoidable readmissions is a central focus of numerous payment reform and delivery system transformation efforts. Until recently, medical or surgical conditions have been the primary focus of hospital readmission reduction efforts, with less attention paid to patients' behavioral health conditions.^{10,11} Given the high hospital utilization and cost associated with comorbid behavioral health conditions,^{12,13} stakeholders share a growing awareness that the provision of quality behavioral health care is integral to any health system improvement program,^{14,15} including readmission reduction.

Stakeholders also recognize that patients with comorbid behavioral health conditions have a higher than average risk of readmission.^{16,17,18} Therefore, efforts to reduce avoidable readmissions may be improved by focusing on delivering transitional care services to patients with behavioral health comorbidities.

Despite the growing recognition that efforts to reduce avoidable readmissions should include targeting interventions toward patients with comorbid behavioral health conditions, there is comparatively little information available on the prevalence of behavioral health comorbidity among hospitalized and readmitted patients on an all-payer, all-condition basis. To address the lack of relevant information and analysis, the Center for Health Information and Analysis (CHIA) released the first statewide, all-payer examination of the prevalence of comorbid behavioral health conditions and readmissions among hospitalized adults in Massachusetts acute care hospitals in August 2016. That report, which used data from State Fiscal Year (SFY) 2014, was the first in a series entitled *Behavioral Health and Readmissions in Massachusetts Acute Care Hospitals*.¹⁹

This report, the third in CHIA's all-payer readmission reports on behavioral health, updates the previous report

with data on inpatient discharges from Massachusetts acute care hospitals in SFY 2018. New analyses in this report explore associations between the presence of any behavioral health comorbidity and inpatient hospital length of stay among top discharge diagnoses.

As the COVID-19 pandemic continues to affect all aspects of our health care system, a greater understanding of its impacts on behavioral health care needs and services may help to inform efforts to improve health care for this vulnerable population.²⁰ CHIA continues to monitor these

developments to better understand the impact of the COVID-19 pandemic on patients with behavioral health comorbidities. While this report uses data collected prior to the advent of the current pandemic, it provides key baseline estimates of the prevalence of behavioral health comorbidities for the hospitalized adult population in Massachusetts, as well as their association with greater risk of readmission in the pre-pandemic period. Insights from this report may help to inform efforts to better target interventions throughout this critical period. ■

Prevalence of Behavioral Health Comorbidities among Patients in Massachusetts Acute Care Hospitals

This section examines the prevalence of behavioral health comorbidity among adult patients admitted to Massachusetts acute care hospitals. This analysis is based on patients who were discharged from Massachusetts acute care hospitals between July 1, 2017 and June 30, 2018 (SFY 2018). Using discharge diagnosis information, all adult (age 18+) hospitalized patients were identified as having up to 10 sub-types of comorbid mental health conditions (MH) and up to eight sub-types of substance use disorders (SUD).²¹ From these indicators patients were categorized into four mutually exclusive groups:

1. Mental health conditions (MH) only
2. Substance use disorders (SUD) only
3. Both MH and SUD or co-occurring conditions (CO)
4. No mention of MH or SUD (None)

Key Findings

- Forty-five percent (45%) of hospitalized patients in Massachusetts acute care hospitals had at least one comorbid behavioral health condition in SFY 2018.
- Sixty-two percent (62%) of hospitalized Medicaid adults had a comorbid behavioral health condition, which was roughly fifty percent (50%) higher than the prevalence in Medicare or commercial populations (at 42% and 40%, respectively).
- Anxiety disorders and mood disorders had the highest prevalence of any comorbid mental health condition, at 26% and 25%, respectively.
- Alcohol- and opioid-related disorders had the highest prevalence of comorbid substance use disorders, at 9% and 6%, respectively. Among patients with any comorbid substance use disorder, more than half (55%) had a comorbid alcohol-related disorder.

- Behavioral health comorbidity was most prevalent among patients aged 18-44, at 60%. Among these patients, one in four (25%) had co-occurring mental health conditions and substance use disorders.
- Male patients were three times more likely than female patients to have comorbid substance use disorders only (9% vs. 3%).
- Patients with any behavioral health comorbidity had inpatient stays that were, on average, 1.4 days longer than patients with no behavioral health comorbidity (5.7 days vs. 4.3 days).
- Fall River and the Berkshires had the highest prevalence of behavioral health comorbidity (over 50% of hospitalized patients) in Massachusetts. ■

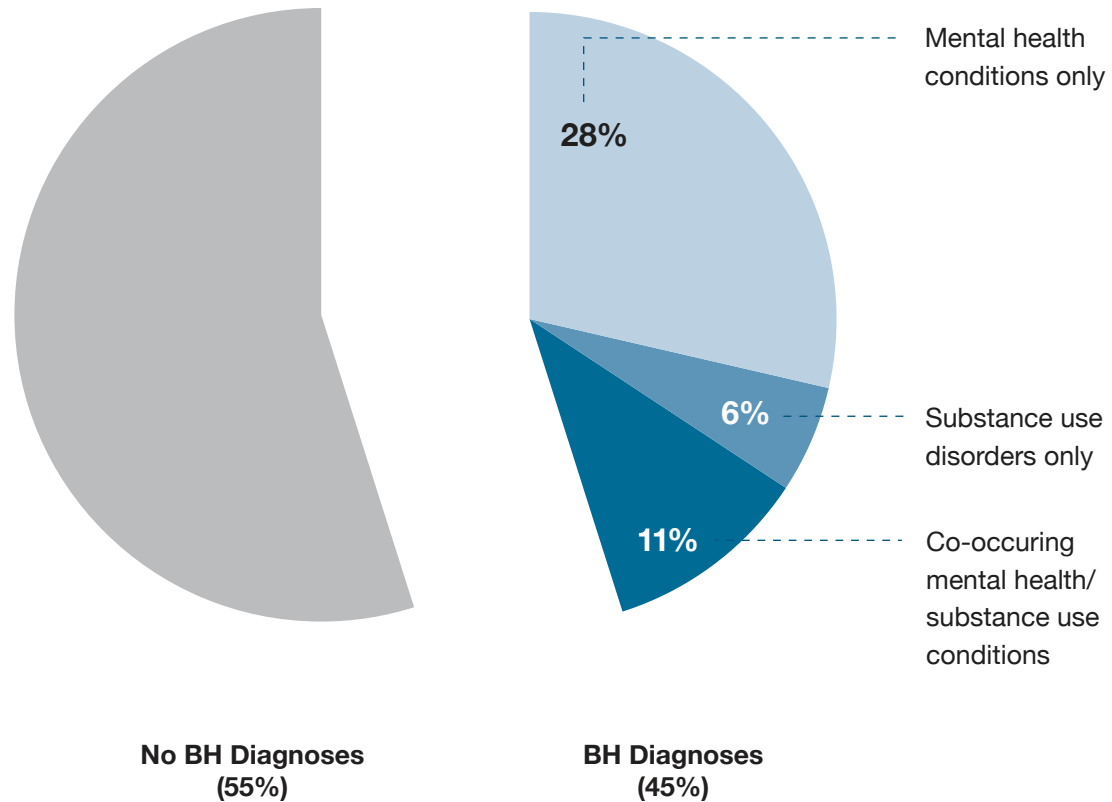
Prevalence

Statewide Prevalence of Behavioral Health Comorbidity among Patients in Acute Care Hospitals, SFY 2018

Forty-five percent (45%) of adult patients hospitalized in Massachusetts acute care hospitals between July 2017 and June 2018 had at least one comorbid behavioral health condition.

Among patients with any behavioral health comorbidity, 28% had a diagnosis of mental health condition only, 6% had a diagnosis of substance use disorder only, and 11% had both.

The high prevalence of behavioral health comorbidity highlights the importance of integrating behavioral health into care transition and discharge planning at acute care hospitals.



Note: Analyses include discharges for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. BH = Behavioral Health. Percentages may not add up to totals due to rounding. Total patients: N = 386,978.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017-June 2018.

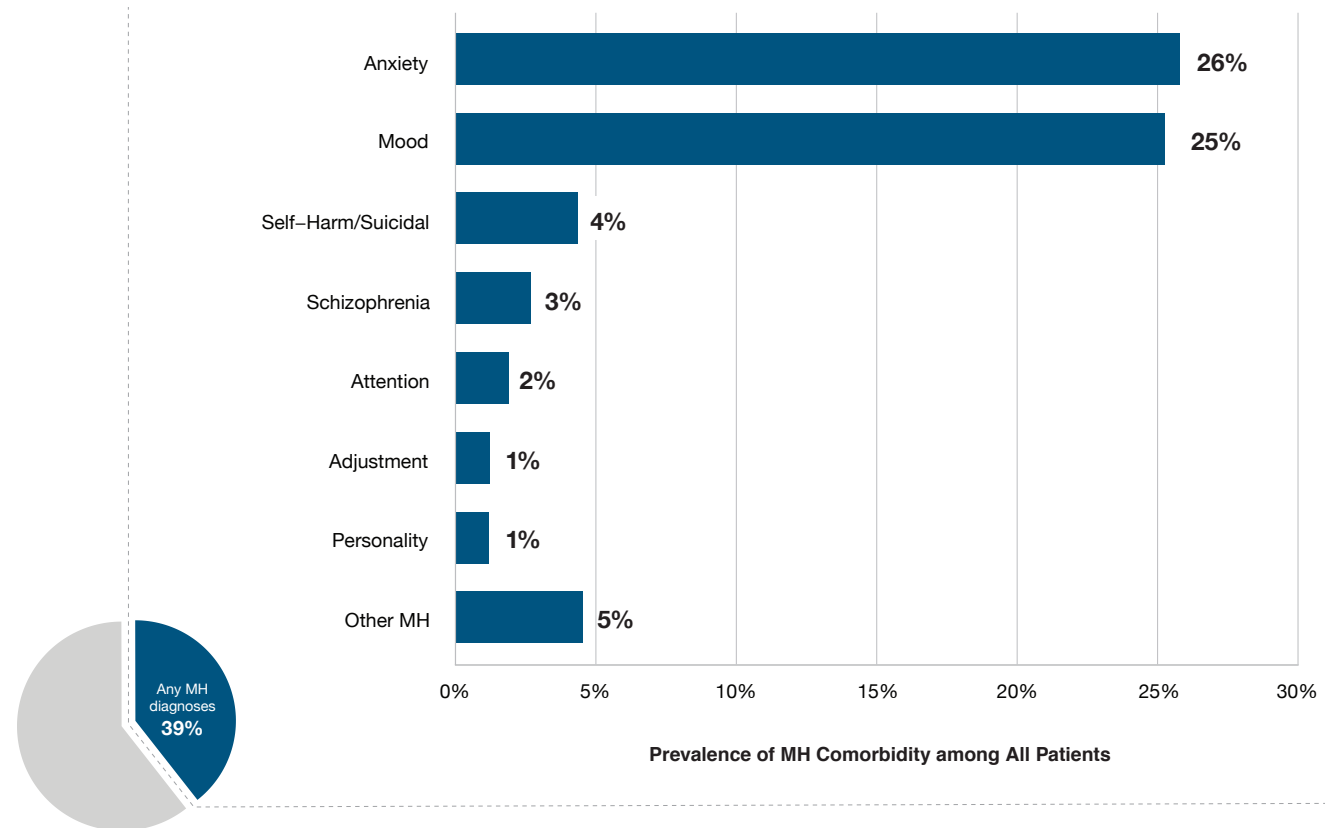
Prevalence

Among hospitalized adults in Massachusetts acute care hospitals, thirty-nine percent (39%) had at least one comorbid mental health condition.

The most common comorbid mental health conditions among all patients were anxiety disorders at 26%, and mood disorders, which include depression and bipolar disorders, at 25%.

Among patients with any comorbid mental health condition, 93% had an anxiety disorder, a mood disorder, or both (data not shown).

Statewide Prevalence of Mental Health Comorbidity among Patients in Acute Care Hospitals, SFY 2018



Note: Analyses include discharges for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. Patients with multiple comorbid mental health conditions may appear in more than one category. MH = Mental health condition; Attention = Attention-deficit, conduct, and disruptive behavior disorders; Schizophrenia = Schizophrenia and other psychotic disorders; Self-harm/Suicidal = Suicidal ideation and intentional self-harm. See [technical appendix](#) for category definitions. Total patients: N = 386,978.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017–June 2018.

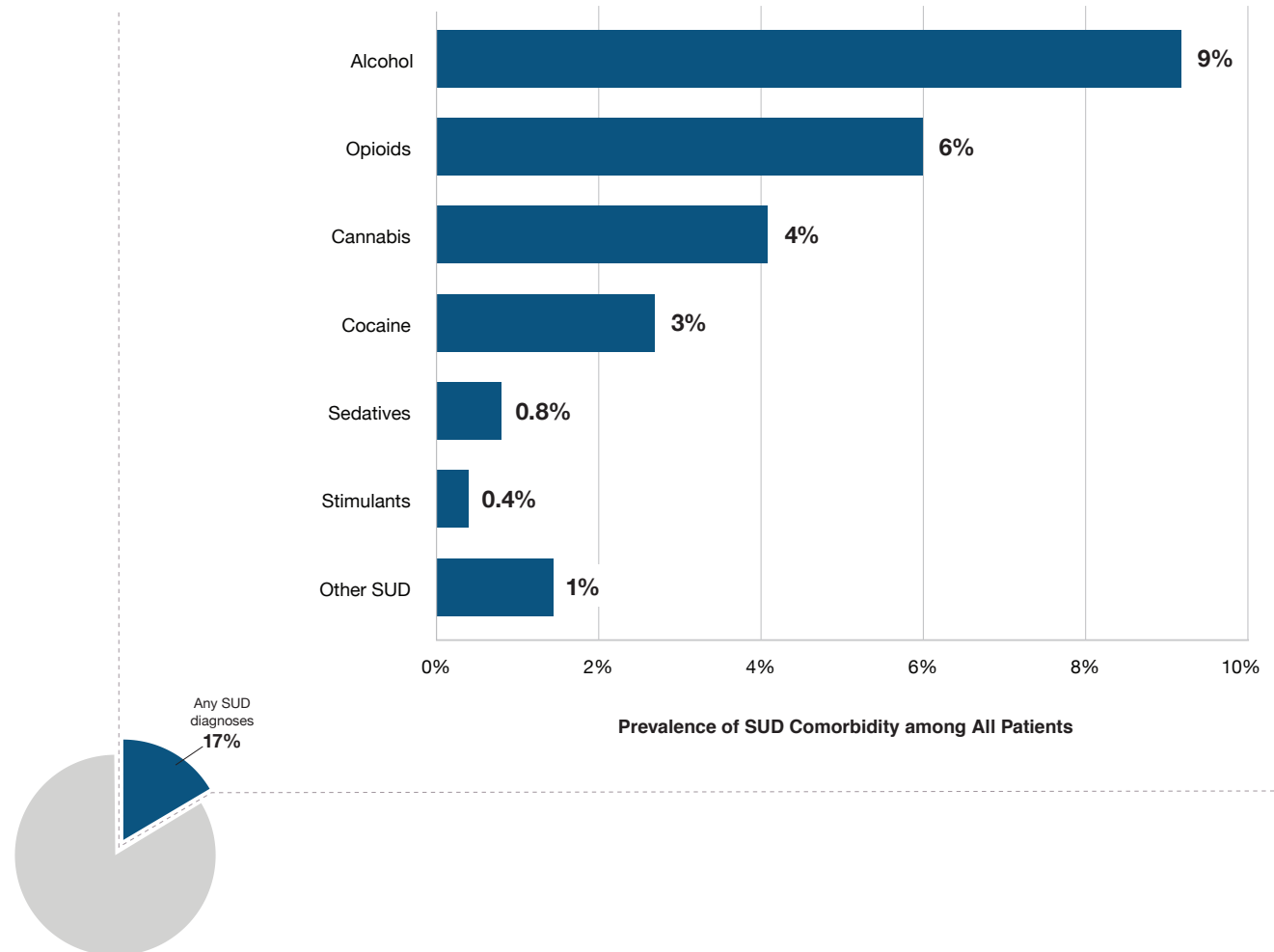
Prevalence

Among hospitalized adults in Massachusetts acute care hospitals, 17% had at least one comorbid substance use disorder.

The most common comorbid substance use disorders were alcohol-related disorders (9%), opioid-related disorders (6%), and cannabis-related disorders (4%).

Among patients with any comorbid substance use disorder, more than half (55%) had a comorbid alcohol-related disorder (data not shown).

Statewide Prevalence of Substance Use Disorder Comorbidity among Patients in Acute Care Hospitals, SFY 2018



Note: Analyses include discharges for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. Patients with multiple comorbid substance use disorders may appear in more than one category. SUD = Substance use disorders; Stimulants = Stimulant-related disorders other than cocaine. See [technical appendix](#) for category definitions. Total patients: N = 386,978.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017-June 2018.

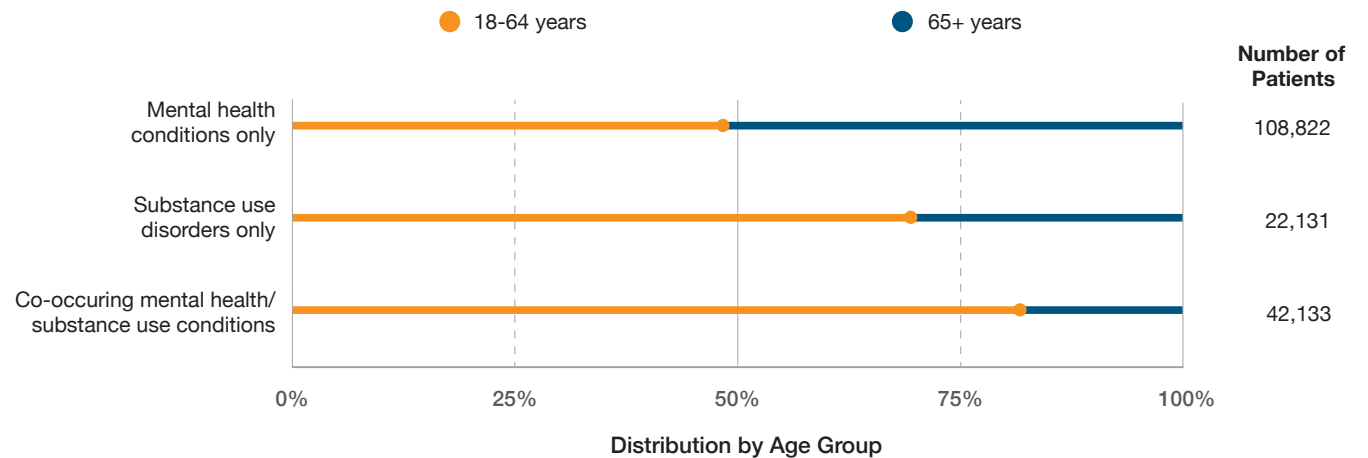
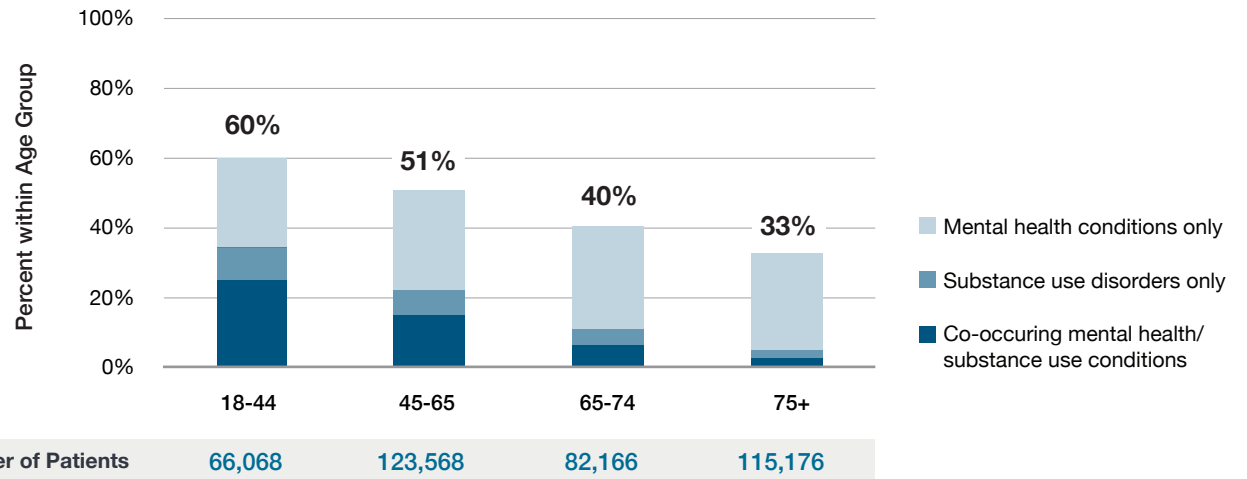
Prevalence

Comorbid behavioral health conditions were more common among younger adults than other age groups, with 60% of patients aged 18-44 having at least one comorbid behavioral health condition.

Twenty-five percent (25%) of patients aged 18-44 had co-occurring mental health and substance use conditions.

The majority (69%) of patients with comorbid substance use disorders only were under age 65. Approximately half (52%) of patients with comorbid mental health conditions only were patients aged 65 years or older.

Prevalence of Behavioral Health Comorbidity by Age Group, SFY 2018



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017–June 2018.

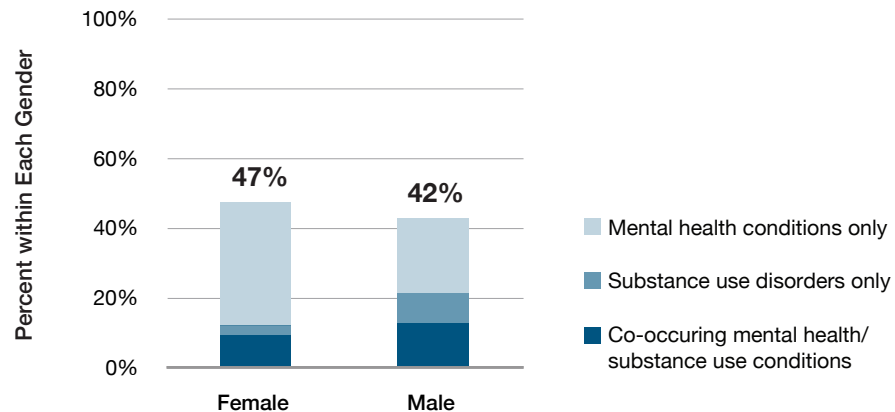
Prevalence

The overall prevalence of comorbid behavioral health conditions was slightly higher for female patients (47%) than for male patients (42%).

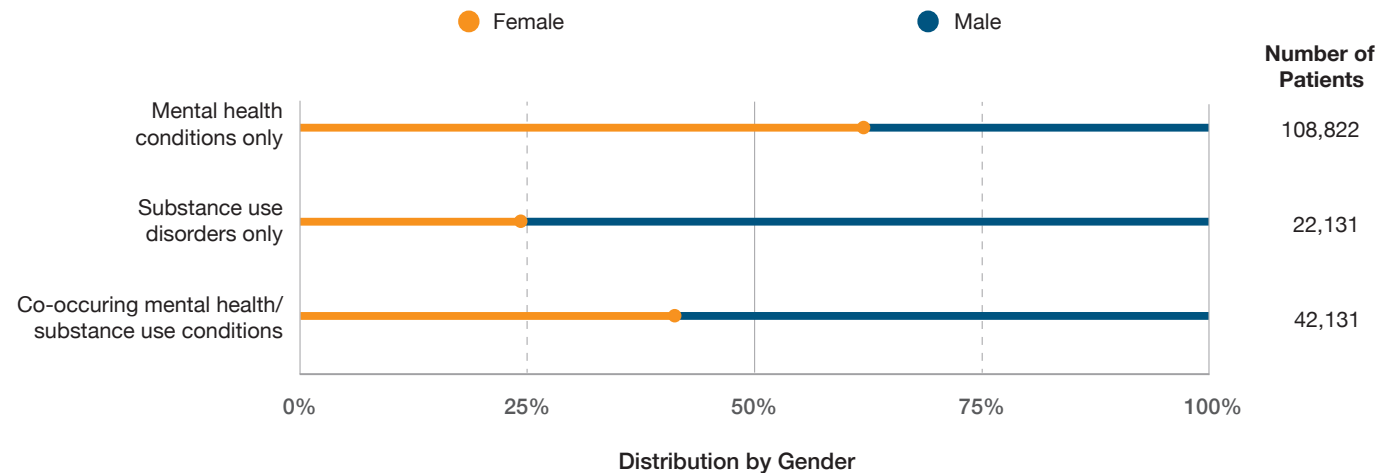
Male patients were three times more likely than female patients to have comorbid substance use disorders only (9% vs. 3%).

Among patients with comorbid mental health conditions only, nearly two out of three (65%) were female.

Prevalence of Behavioral Health Comorbidity by Gender, SFY 2018



Number of Patients	Female	Male
	200,967	186,007



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. Figures for male and female may not sum to the total values due to rounding and because they exclude four patients (<0.01%) and four discharges (<0.01%) with Other Gender category.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017-June 2018.

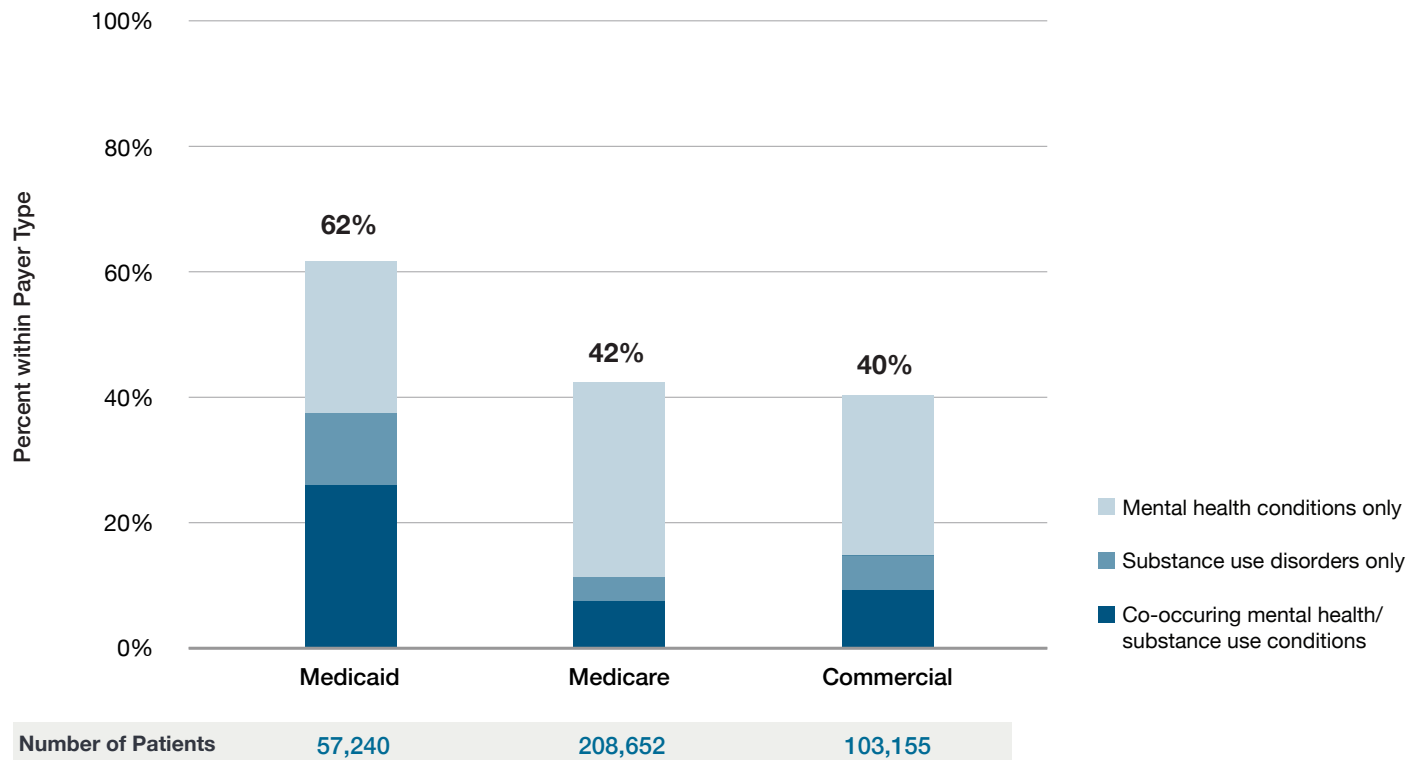
Prevalence

Sixty-two percent (62%) of patients with Medicaid had a comorbid behavioral health condition; Medicare and commercially insured were 42% and 40%, respectively.

Medicaid patients were three times as likely to have comorbid substance use disorders only (12% vs. 4%), and three and a half times as likely to have comorbid co-occurring mental health and substance use conditions (26% vs. 8%) as compared to Medicare patients.

Compared to patients with commercial insurance, Medicaid patients were twice as likely to have comorbid substance use disorders only (12% vs. 6%), and nearly three times as likely to have comorbid co-occurring mental health and substance use conditions (26% vs. 9%).

Prevalence of Behavioral Health Comorbidity by Payer Type, SFY 2018



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. Self-pay and other categories, which together account for 5% of patients, and 4% of discharges, as well as a small number of discharges with missing payer information are excluded in this chart.

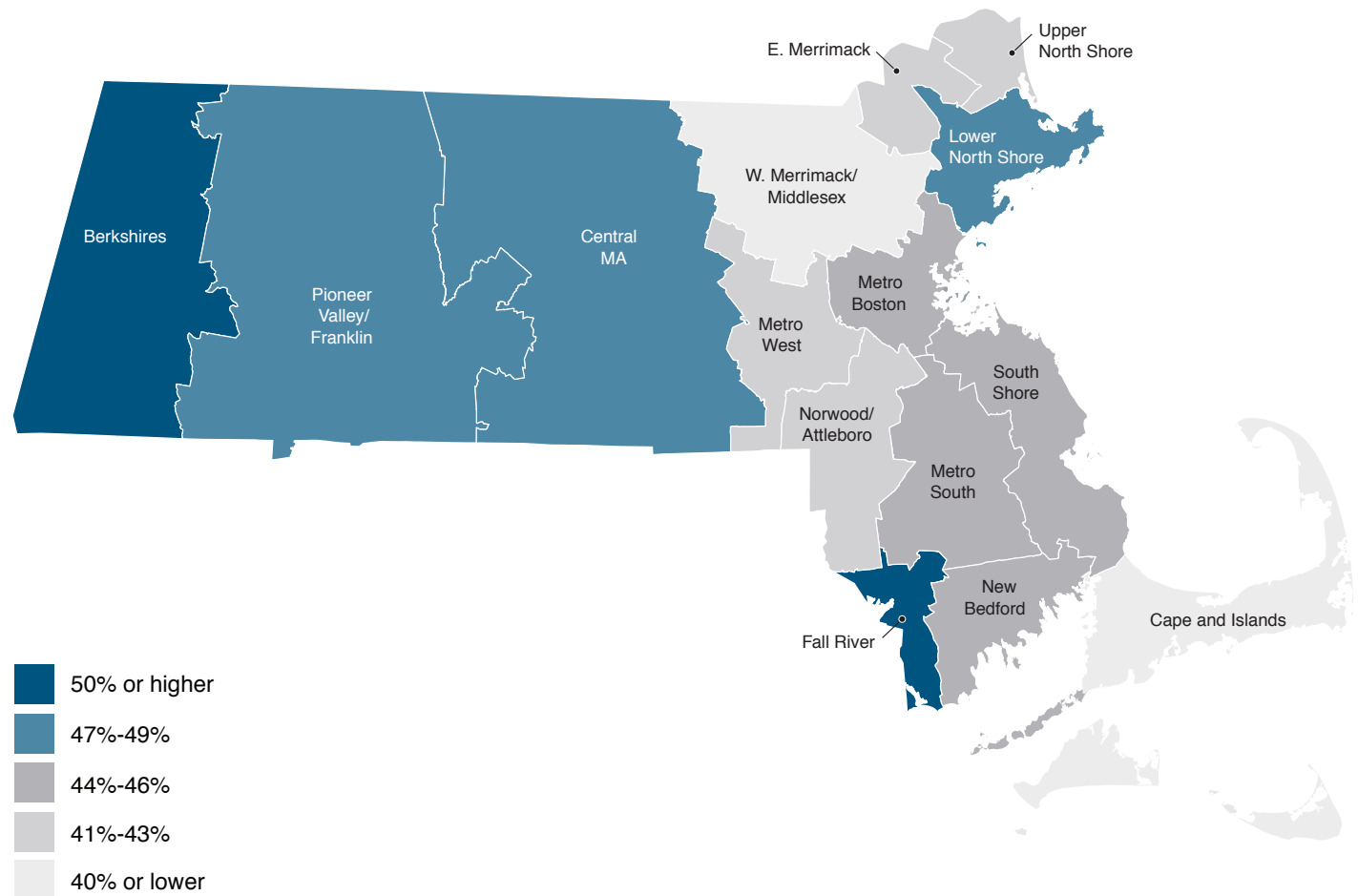
Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017-June 2018.

Prevalence

Prevalence of Behavioral Health Comorbidity by Region of Patient Residence, SFY 2018

The prevalence of behavioral health comorbidity among hospitalized adults varied by region from 39% of patients in the Cape and Islands to 52% of patients in Fall River.

Fall River (52%) and the Berkshires (51%) had the highest prevalence of behavioral health comorbidity, which is 17% higher than the state overall (45%).



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. Regions are defined by the Massachusetts Health Policy Commission.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017-June 2018.

Prevalence

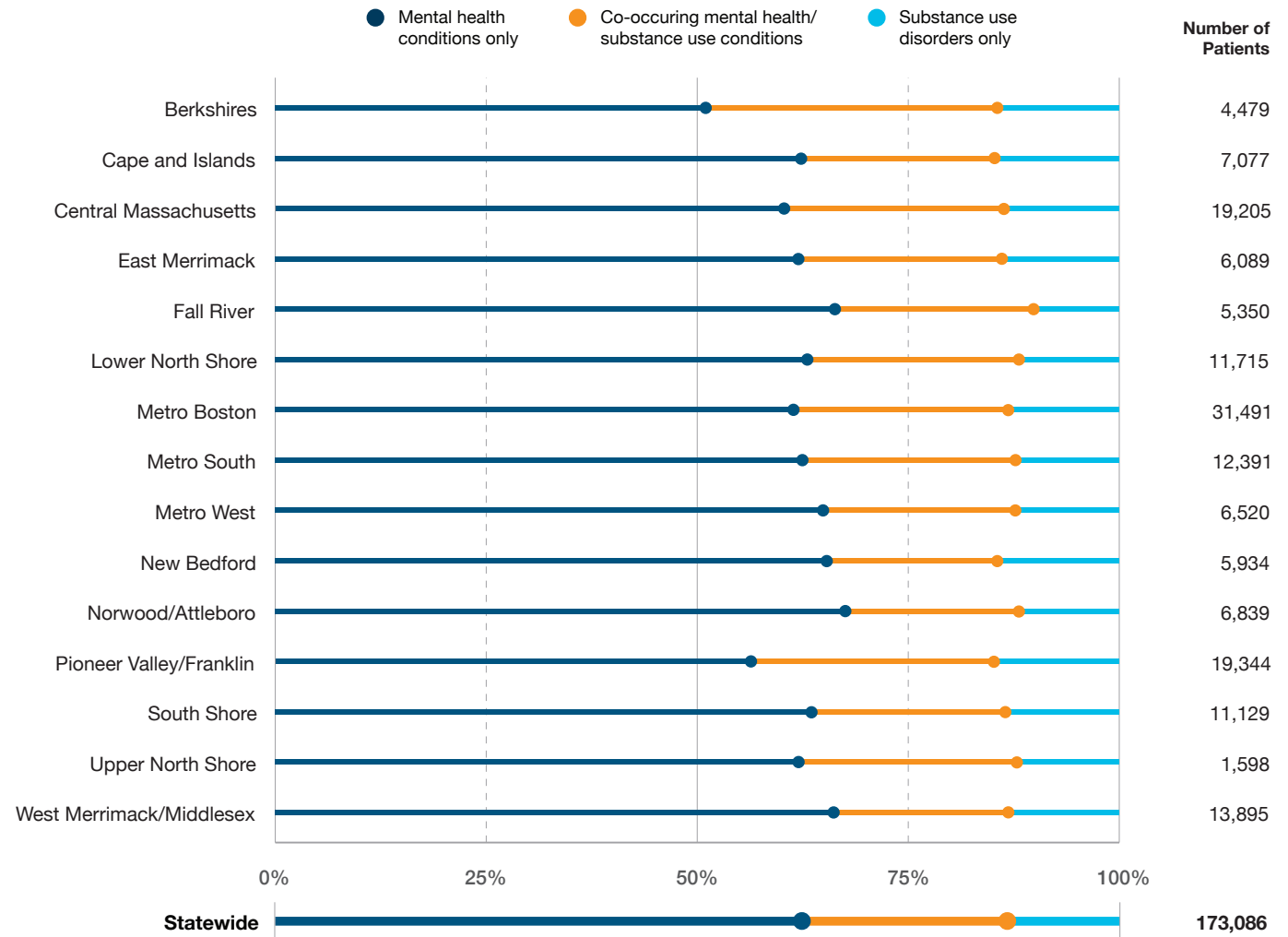
Types of Behavioral Health Comorbidity by Region of Patient Residence, SFY 2018

The types of comorbid behavioral health conditions varied by region.

Norwood/Attleboro and Fall River had the highest proportion of patients with comorbid mental health conditions only, at 68% and 67%, respectively.

The Berkshires and Pioneer Valley/Franklin had the highest proportion of patients with comorbid co-occurring mental health and substance use conditions, at 35% and 29%, respectively.

Pioneer Valley/Franklin and the Cape and Islands had the greatest proportion of patients with comorbid substance use disorders only, both at 14%.



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. Regions are defined by the Massachusetts Health Policy Commission.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017-June 2018.

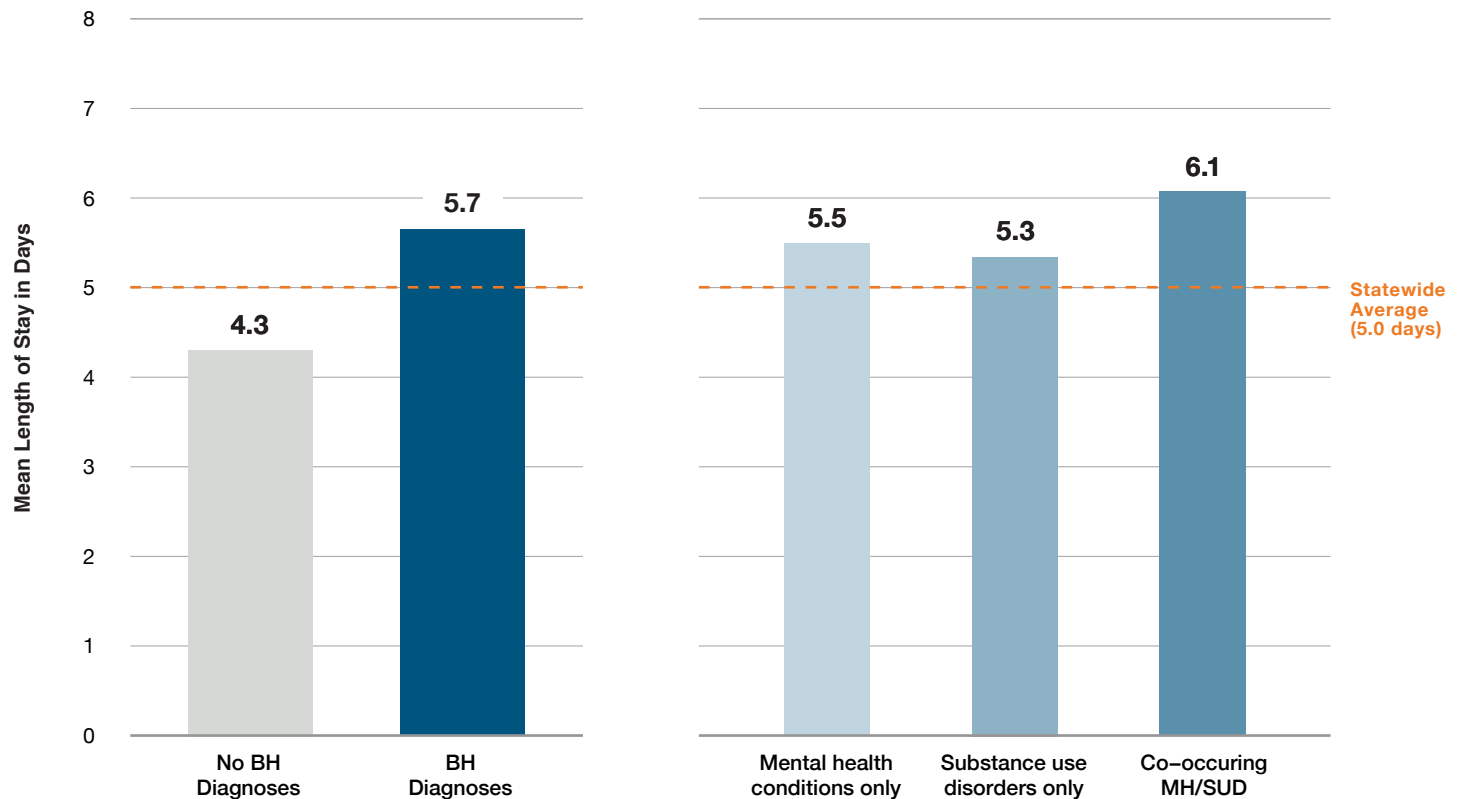
Prevalence

Patients with comorbid behavioral health conditions stayed in the hospital an average of 1.4 days longer than patients without any behavioral health comorbidity (5.7 days vs. 4.3 days).

Patients with comorbid co-occurring mental health and substance use conditions had the longest length of stay, at 6.1 days. This was 42% longer than the length of stay for patients with no behavioral health comorbidity.

The average length of stay was also longer for patients with comorbid mental health conditions only (5.5 days) and comorbid substance use disorders only (5.3 days) than those without any behavioral health comorbidity (4.3 days).

Presence of Behavioral Health Comorbidity and Length of Stay, SFY 2018



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. BH = Behavioral Health, MH/SUD = Mental Health Conditions/Substance Use Disorders. The unit of this analysis is discharges. The statewide average length of stay (ALOS) in this report is not directly comparable to the ALOS presented in CHIA's annual report on readmissions, *Hospital-Wide Adult All-Payer Readmissions in Massachusetts: SFY 2011-2018*, due to the inclusion of discharges with a primary psychiatric diagnosis.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017-June 2018.

Statewide Readmissions and Behavioral Health Comorbidity among Patients in Massachusetts Acute Care Hospitals

This section examines the readmission rates among patients with and without comorbid behavioral health conditions. To better understand the impact of behavioral health comorbidity on readmission rates, CHIA first examined readmission rates at the statewide level, and then analyzed readmission rates by age, payer type, discharge setting, region of patient residence, and discharge diagnosis.

Key Findings

- Hospitalized adults who had any behavioral health comorbidity accounted for 45% of patients, 52% of hospitalizations, and 68% of all readmissions.
- Patients with any behavioral health comorbidity were nearly twice as likely to be readmitted as those without any behavioral health comorbidity (20.4% vs. 10.5%).
- Patients with comorbid co-occurring mental health and substance use conditions had the highest readmission rate at 26.8% which is higher than the readmission rate for heart failure—the most common current clinical focus of readmission reduction efforts²²—at 24.6%.
- Younger adults (age 18-44) with behavioral health comorbidity had readmission rates three times higher than younger adults without any behavioral health comorbidity (17.1% vs. 5.7%).
- Medicaid patients with comorbid co-occurring mental health and substance use conditions had readmission rates that were over three times higher than Medicaid patients without any behavioral health comorbidity (25.8% vs. 7.9%).
- For the top five discharge diagnoses leading to the most readmissions, the presence of a comorbid

behavioral health condition was associated with an increase in the readmission rate of at least 60%.

- Among patients discharged to home, 52% had a comorbid behavioral health condition. The readmission

rate among patients with any behavioral health comorbidity discharged to home was 135% higher than for those with no behavioral health comorbidity (17.2% vs. 7.3%). ■

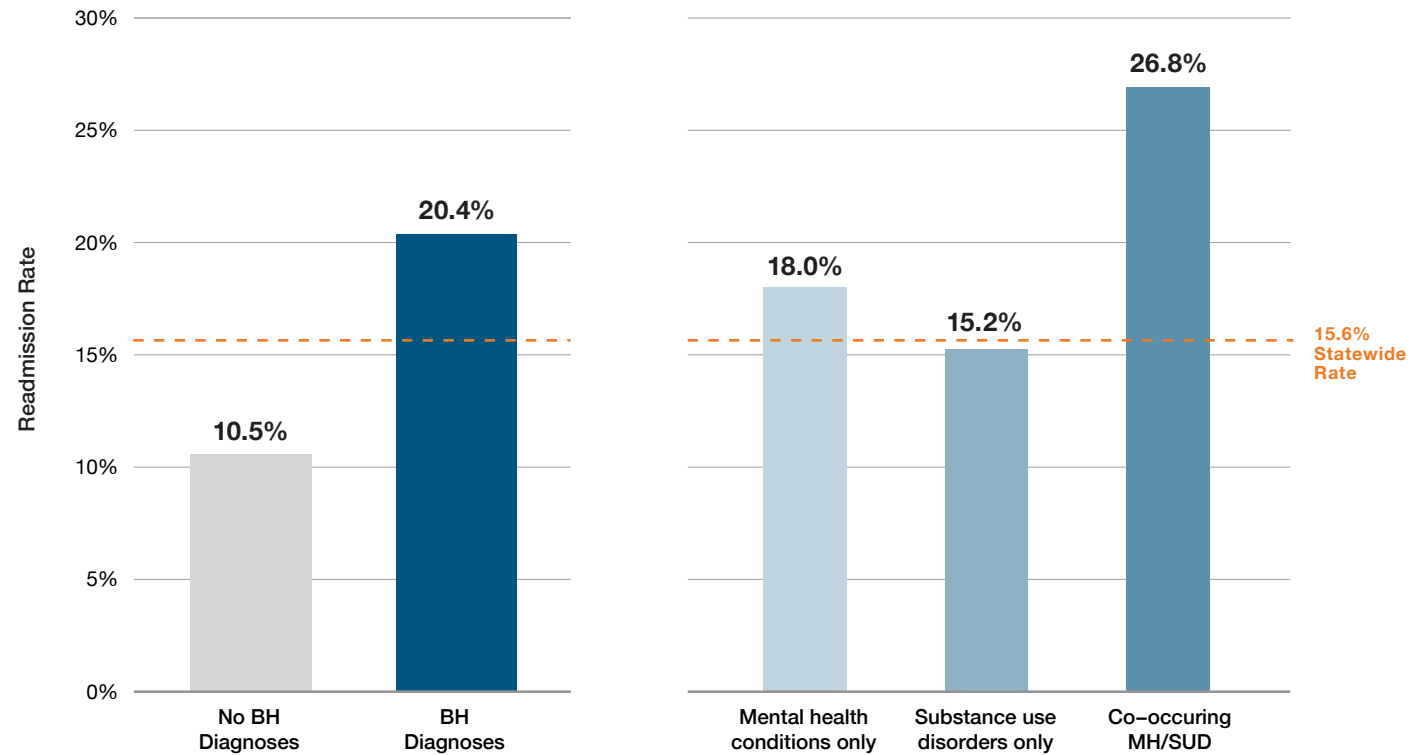
Readmission Rates

The readmission rate for patients with behavioral health comorbidities was nearly twice as high as the readmission rate for patients without any behavioral health comorbidity (20.4% vs. 10.5%).

Patients with comorbid co-occurring mental health and substance use conditions had the highest readmission rate (26.8%), which was more than two and a half times the rate of patients with no behavioral health comorbidity (10.5%). This was higher than the readmission rate for heart failure—the most common current clinical focus of readmission reduction efforts²³—at 24.6%.

Relative to patients without any behavioral health comorbidity, patients with comorbid mental health conditions only and substance use disorders only had higher readmission rates, at 18.0% and 15.2%, respectively.

Statewide Readmission Rates and Behavioral Health Comorbidity, SFY 2018



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. BH = Behavioral Health, MH/SUD = Mental Health Conditions/Substance Use Disorders. The statewide readmission rate in this report is not directly comparable to the rate in CHIA's annual report on readmissions, *Hospital-Wide Adult All-Payer Readmissions in Massachusetts: SFY 2011-2018*, due to the inclusion of discharges with a primary psychiatric diagnosis.

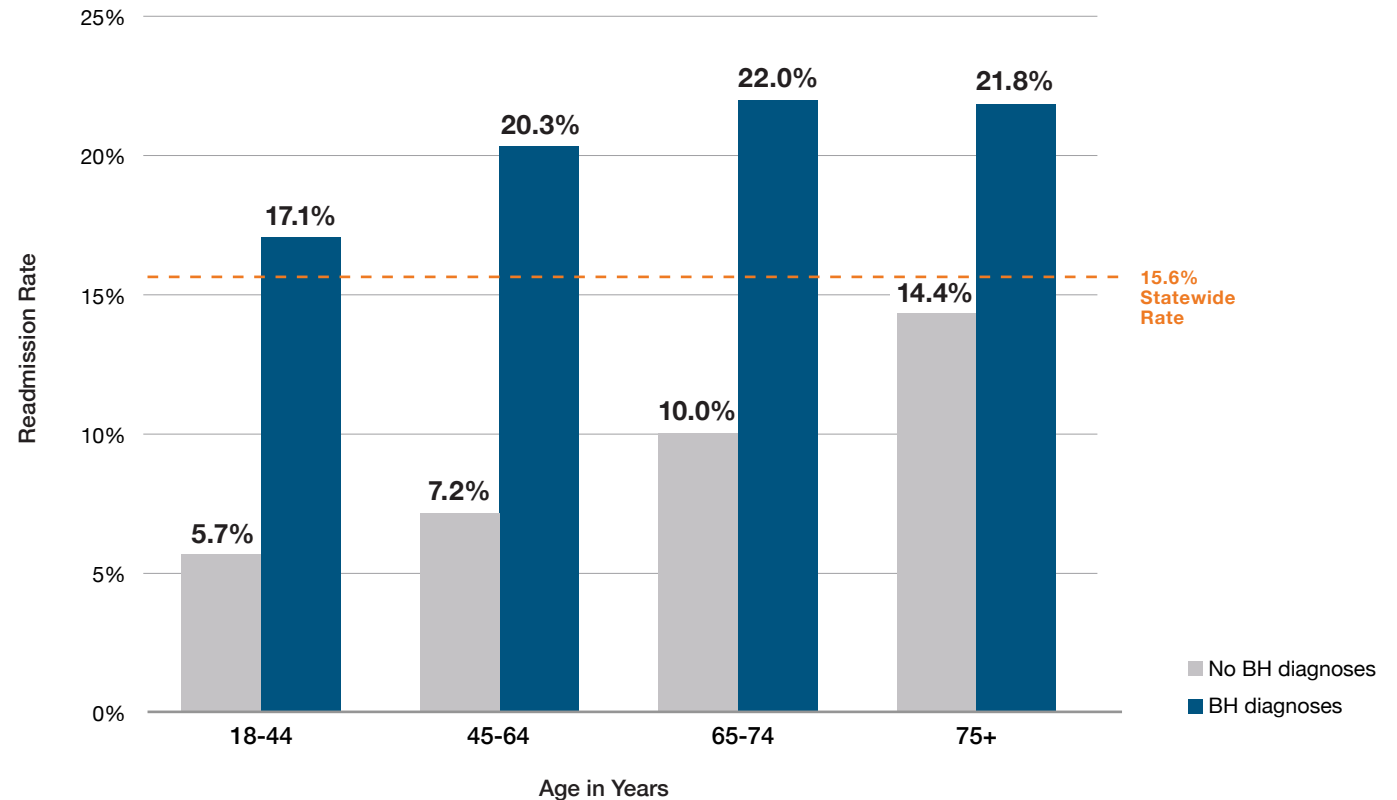
Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017-June 2018.

Readmission Rates

For every age group, readmission rates were higher with comorbid behavioral health conditions than without, and the difference in the rates was most pronounced among younger adults.

The difference in readmission rates between those with and without comorbid behavioral health conditions was greatest for younger adults (age 18-44). Those with any behavioral health comorbidity had readmission rates three times higher than those without (17.1% vs. 5.7%).

Readmission Rates and Behavioral Health Comorbidity by Age, SFY 2018



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. The statewide readmission rate in this report is not directly comparable to the rate in CHIA's annual report on readmissions, *Hospital-Wide Adult All-Payer Readmissions in Massachusetts: SFY 2011-2018*, due to the inclusion of discharges with a primary psychiatric diagnosis.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017-June 2018.

Readmission Rates and Behavioral Health Comorbidity by Payer Type, SFY 2018

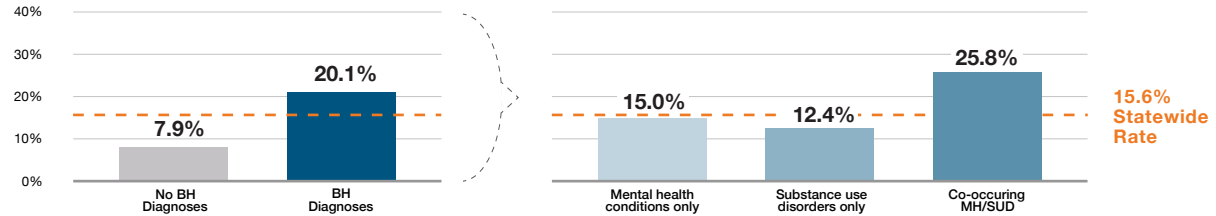
Across payer types, patients with any behavioral health comorbidity had higher readmission rates than those without any behavioral health comorbidity. Comorbid co-occurring mental health and substance use conditions were consistently associated with higher readmission rates than other types of behavioral health comorbidities.

Medicaid patients with comorbid co-occurring mental health and substance use conditions had readmission rates that were more than three times higher than those without any behavioral health comorbidity: 25.8% vs. 7.9%.

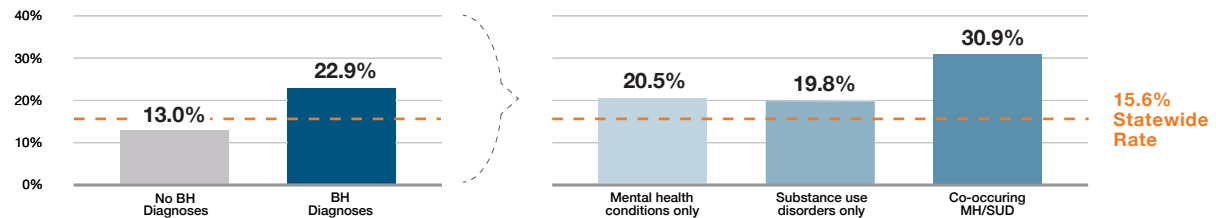
Medicaid and commercial patients without any behavioral health comorbidity had relatively similar readmission rates at 7.9% and 6.5%, respectively.

Medicare patients with comorbid co-occurring mental and substance use conditions had the highest readmission rate at 30.9%.

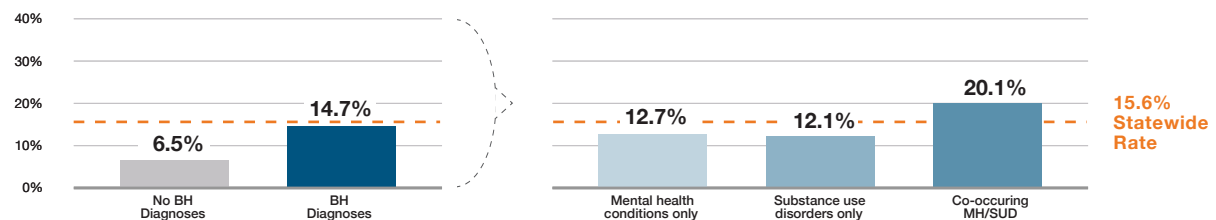
Medicaid



Medicare



Commercial



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. BH = Behavioral Health, MH/SUD = Mental Health Conditions/Substance Use Disorders. Figure excludes self-pay and other categories, which together account for 4% of patients and 3% of discharges. A small number of discharges with missing payer information is also excluded. The statewide readmission rate in this report is not directly comparable to the rate in CHIA's annual report on readmissions, *Hospital-Wide Adult All-Payer Readmissions in Massachusetts: SFY 2011-2018*, due to the inclusion of discharges with a primary psychiatric diagnosis.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017–June 2018.

Readmission Rates

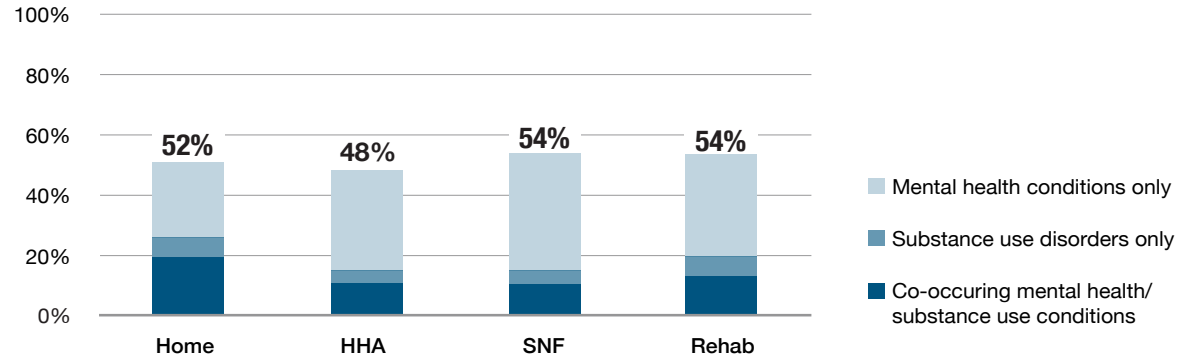
Readmission rates were higher with the presence of behavioral health comorbidity for patients discharged to all post-acute care settings.

More than half of all discharges to home (52%) had any comorbid behavioral health condition, and nearly one in five discharges to home had co-occurring mental health and substance use conditions.

The readmission rate for patients discharged to home with co-occurring mental health and substance use conditions was three and a half times the rate for those without any behavioral health comorbidity (24.8% vs. 7.3%).

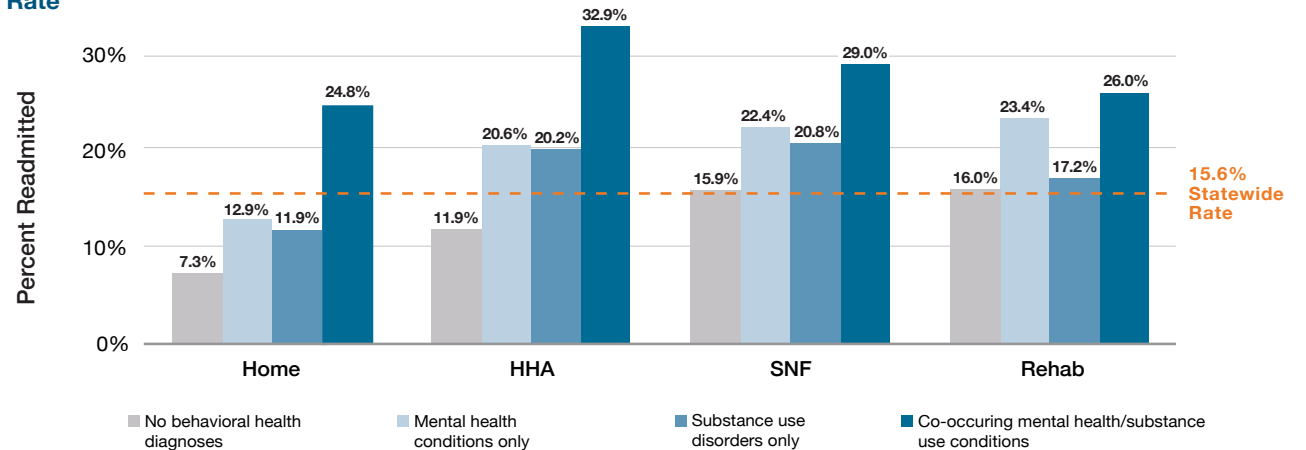
Readmission Rates and Behavioral Health Comorbidity by Common Discharge Setting, SFY 2018

Percent of Discharges



Number of Discharges	Home	HHA	SNF	Rehab
	273,379	154,412	95,994	25,360

Readmission Rate



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. The unit of this analysis is discharges. HHA= Home with home health agency care; SNF = Skilled nursing facility; Rehab = Rehabilitation facility. Hospice and other categories are excluded, which account for 3.6% of discharges. Discharges with missing discharge setting information are also excluded. For full category definitions, please see [technical appendix](#). The statewide readmission rate in this report is not directly comparable to the rate in CHIA's annual report on readmissions, *Hospital-Wide Adult All-Payer Readmissions in Massachusetts: SFY 2011-2018*, due to the inclusion of discharges with a primary psychiatric diagnosis.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017–June 2018.

Readmission Rates

In all regions, the presence of behavioral health comorbidity substantially increased readmission rates by 76%-115%.

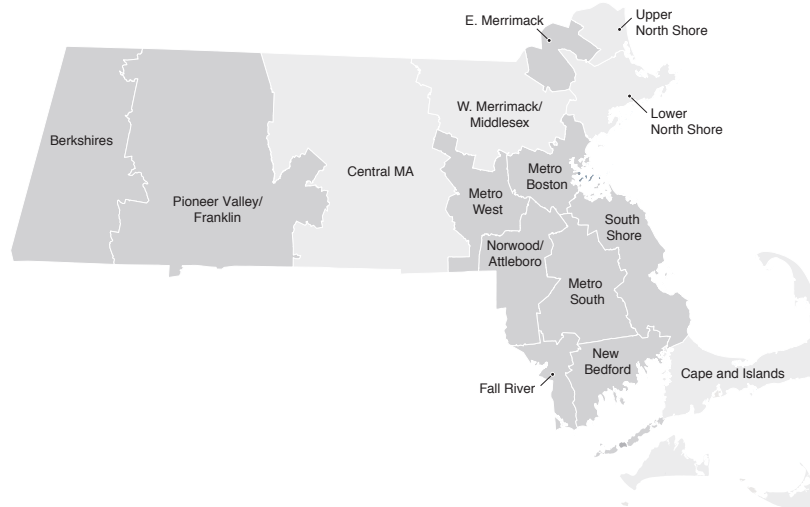
Readmission rates for patients without comorbid behavioral health conditions ranged from 9.5% in the Cape and Islands to 12.3% in New Bedford.

Readmission rates for patients with comorbid behavioral health conditions varied from 17.0% in the Cape and Islands to 22.8% in Fall River. Differences in readmission rates with and without behavioral health comorbidities were particularly pronounced for Fall River, Metro South, and Central MA; readmission rates were twice as high in these regions among patients with behavioral health comorbidities.

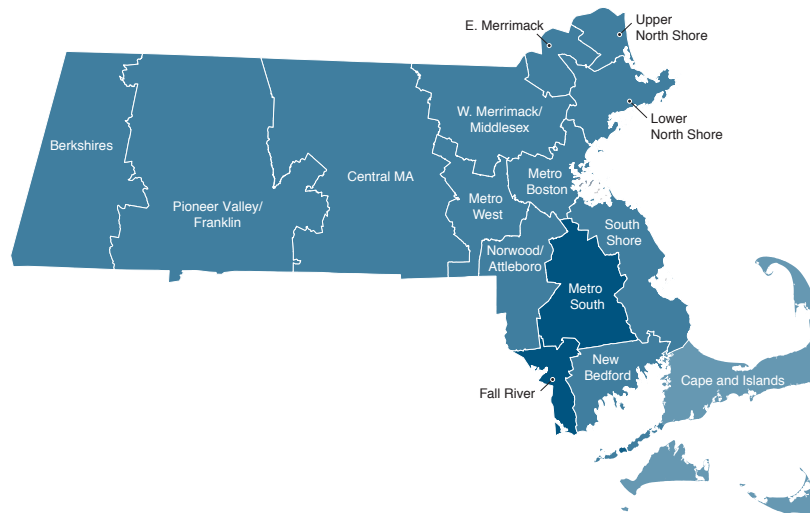
These differences could be due to regional variations in patient demographics and community characteristics including care transition practices, quality of clinical care and community-based resources. However, these differences also highlight potential opportunities for interventions.

Readmission Rates and Behavioral Health Comorbidity by Region of Patient Residence, SFY 2018

Readmission Rates with No Behavioral Health Comorbidity



Readmission Rates with Behavioral Health Comorbidity



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. Regions are defined by the Massachusetts Health Policy Commission.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017–June 2018.

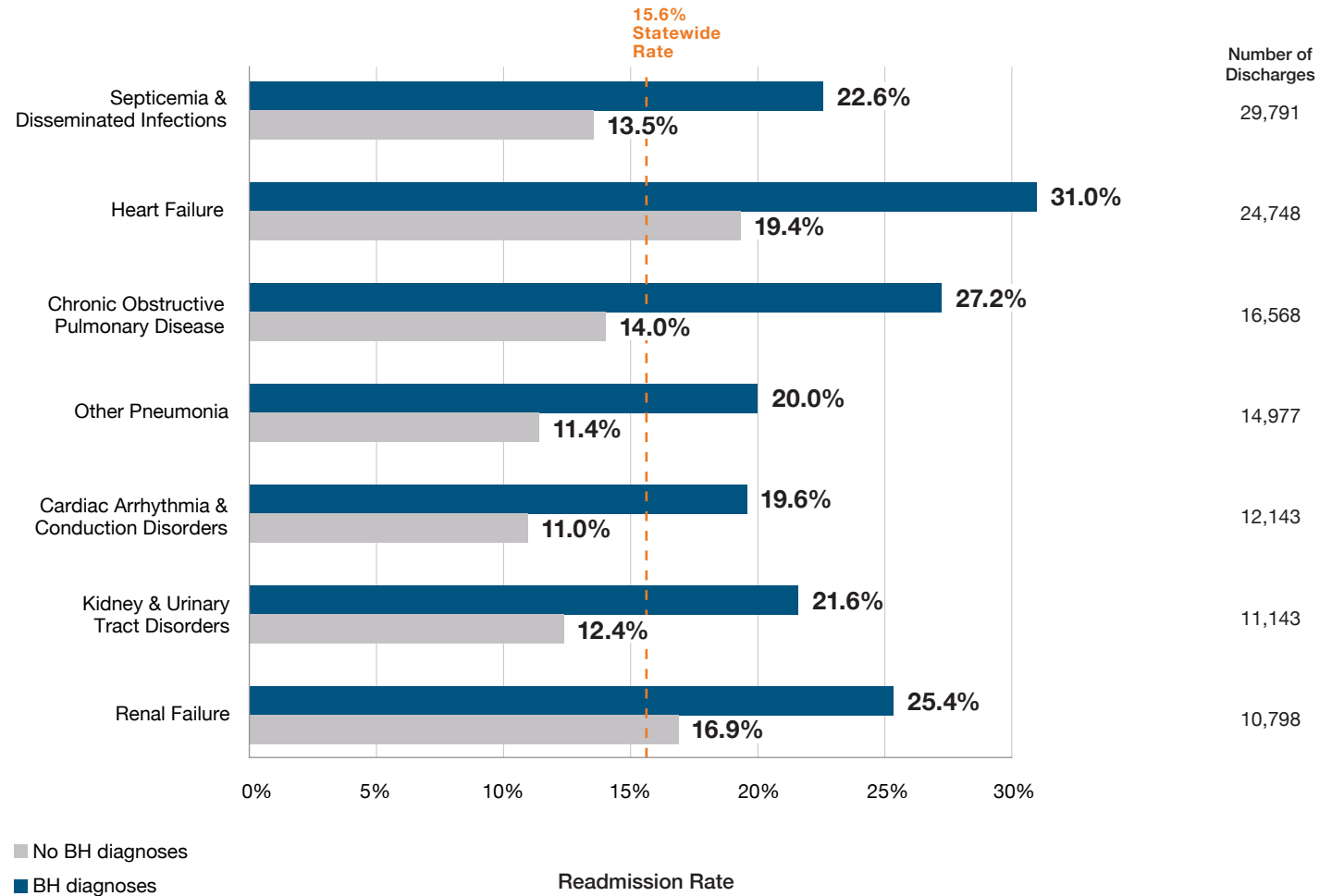
Readmission Rates and Behavioral Health Comorbidity by Common Discharge Diagnosis, SFY 2018

Among the top discharge diagnoses leading to the most readmissions in Massachusetts, readmission rates were 50-94% higher among patients with behavioral health comorbidities than among patients with no behavioral health comorbidities.

For patients with heart failure—the most commonly targeted medical diagnosis for readmission reduction efforts²⁴—the presence of behavioral health comorbidity was associated with a 60% increase in the readmission rate (from 19.4% to 31.0%).

The difference in readmission risk associated with the presence of behavioral health comorbidity was even more pronounced for patients discharged with chronic obstructive pulmonary disease (COPD). Behavioral health comorbidity was associated with a 94% increase in the readmission rate for COPD discharges (from 14.0% to 27.2%).

Understanding the impact of behavioral health comorbidity on these and other discharge diagnoses may inform efforts to improve care and present opportunities to reduce the risk of readmission for patients with these conditions.



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. Diagnostic categories are defined by the All-Payer Refined Diagnosis-Related Group (APR-DRG, version 30.0) and reflect the most common primary diagnoses among all discharges in the study period. The statewide readmission rate in this report is not directly comparable to the rate in CHIA's annual report on readmissions, *Hospital-Wide Adult All-Payer Readmissions in Massachusetts: SFY 2011-2018*, due to the inclusion of discharges with a primary psychiatric diagnosis.

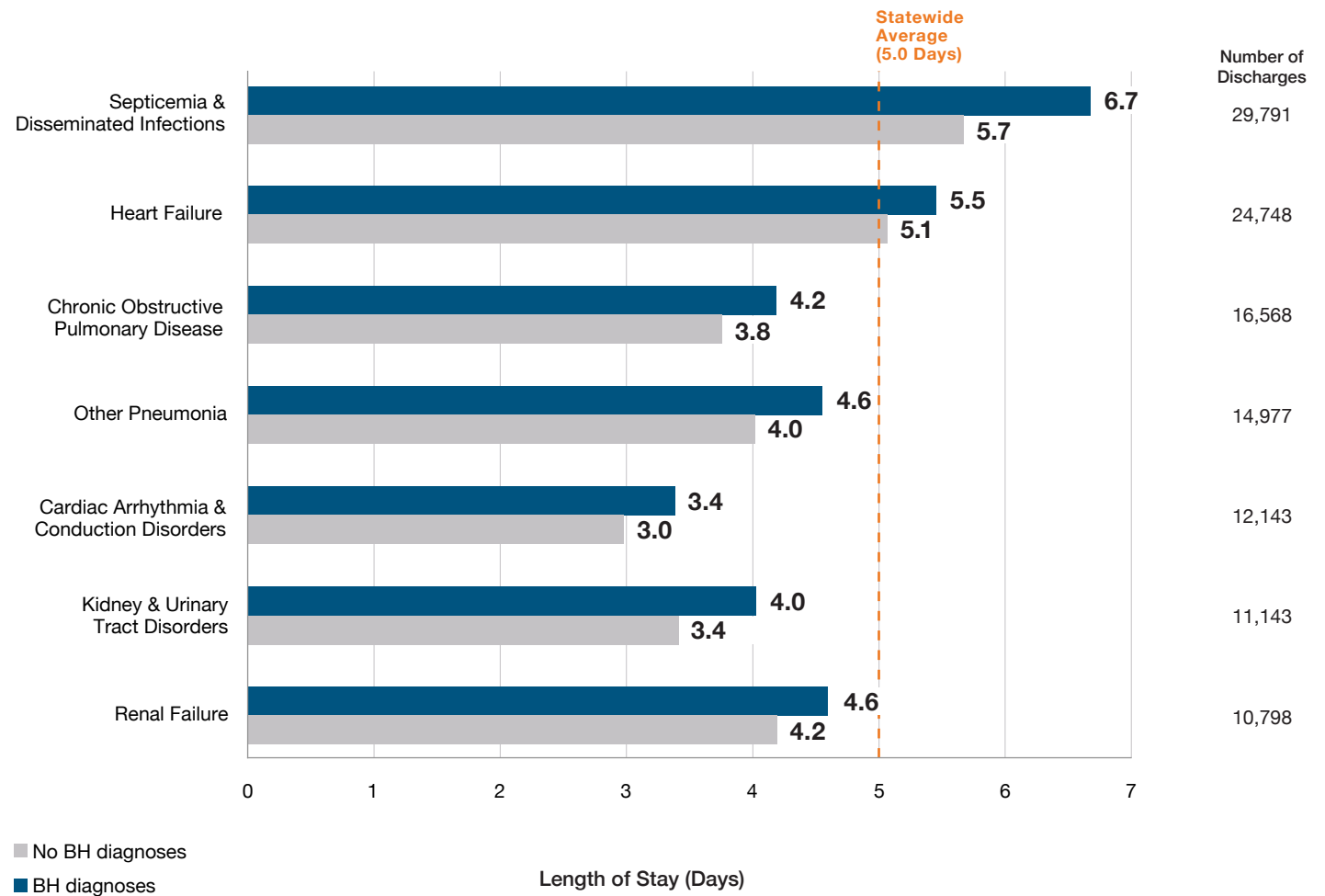
Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017–June 2018.

Length of Stay and Behavioral Health Comorbidity by Common Discharge Diagnosis, SFY 2018

Among the top discharge diagnoses leading to the most readmissions in Massachusetts, the average length of hospital stay was at least 14% higher among patients with comorbid behavioral health conditions than among patients with no behavioral health comorbidity.

The difference in average length of stay with the presence of behavioral health comorbidity was highest for patients discharged with sepsis. Behavioral health comorbidity was associated with an additional day in the average length of stay for sepsis (from 5.7 days to 6.7 days).

For patients discharged for heart failure, the presence of behavioral health comorbidity was associated with an 8% increase in length of stay (from 5.1 days to 5.5 days).



Note: Analyses include discharges from Massachusetts acute care hospitals for adults (age 18+) with any payer and exclude the following discharges: obstetric admission, treatment for cancer, leave against medical advice, and rehabilitative admission. Diagnostic categories are defined by the All-Payer Refined Diagnosis-Related Group (APR-DRG, version 30.0) and reflect the most common primary diagnoses among all discharges in the study period. The statewide average length of stay (ALOS) in this report is not directly comparable to the ALOS presented in CHIA's annual report on readmissions, *Hospital-Wide Adult All-Payer Readmissions in Massachusetts: SFY 2011-2018*, due to the inclusion of discharges with a primary psychiatric diagnosis.

Data source: Massachusetts Hospital Inpatient Discharge Databases, July 2017–June 2018.

Conclusion

This report is the third statewide all-payer examination of the prevalence of behavioral health comorbidity and readmission rates among hospitalized adults in Massachusetts acute care hospitals.

Despite the limitations of using hospital administrative data to identify the presence or absence of a behavioral health condition—e.g., many behavioral health conditions may be undiagnosed and/or under-coded in the medical record or billing codes—there is a high prevalence of behavioral health comorbidity among hospitalized adults in Massachusetts acute care hospitals.

Important differences in the prevalence of behavioral health comorbidity by payer type exist. Compared with patients covered by either Medicare or commercial insurance, Medicaid adults were more likely to have any behavioral health comorbidity. Age was also found to be an important factor—younger adults have nearly twice the prevalence of comorbid behavioral health conditions

as older adults. Additionally, the prevalence of behavioral health comorbidity among hospitalized adults varies regionally across the Commonwealth.

Hospitalized patients with a comorbid behavioral health condition had inpatient stays that were on average 1.4 days longer, and had a readmission rate that was nearly twice as high as the rate for patients without any comorbid behavioral health conditions. Hospitalized patients with comorbid co-occurring mental health and substance use conditions had the highest readmission rate among all patients with behavioral health conditions. For each of the most common discharge diagnoses, the presence of any behavioral health comorbidity was associated with higher readmission rates. This suggests that greater awareness is needed among providers, payers, policymakers, patients, and families/advocates of the increased readmission risk for any hospitalized patient with comorbid behavioral health conditions. ■

Notes

- 1** Massachusetts Hospital Association. 2016. State of the State: Reducing Readmissions in Massachusetts. Burlington, MA: Massachusetts Hospital Association. Available from <https://www.mhalink.org/MHADocs/Resources/2018/16-03-15MHAREADMISSIONSpaperFINAL.pdf>.
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- 5** Owens, P. L., Fingar, K. R., McDermott, K. W., et al. 2019. Inpatient Stays Involving Mental and Substance Use Disorders, 2016. HCUP Statistical Brief #249. Rockville, MD: Agency for Healthcare Research and Quality. Available from <https://www.hcup-us.ahrq.gov/reports/statbriefs/sb249-Mental-Substance-Use-Disorder-Hospital-Stays-2016.jsp>.
- 6** Massachusetts Health Policy Commission. 2019. 2018 Report on Health Care Cost Trends. Boston, MA: Health Policy Commission. Available from <https://www.mass.gov/files/documents/2019/02/20/2018%20Cost%20Trends%20Report.pdf>.
- 7** Ahmedani, B. K., Solberg, L. I., Copeland, L. A., et al. 2015. Influence of psychiatric comorbidity and 30-day readmissions after hospitalization for heart failure, AML, and pneumonia. *Washington, D.C.: Psychiatric services*. Vol.66, No. 2, pp. 134–140. doi:10.1176/appi.ps.201300518.
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- 9** Moreno, C., Wykes, T., Galderisi, S., et al. 2020. How mental health care should change as a consequence of the COVID-19 pandemic. *Lancet Psychiatry*, 7:813-24. doi:10.1016/S2215-0366(20)30307-2.
- 10** See note 2 above.
- 11** See note 3 above.
- 12** See note 4 above.
- 13** See note 5 above.
- 14** See note 2 above.
- 15** Anthony, S., Boozang, P., Chu, B, Striar, A., Manatt Health. 2019. Ready for reform: Behavioral health care in Massachusetts. Boston, MA: Blue Cross Foundation of Massachusetts, Manatt Health. Available from: https://bluecrossmafoundation.org/sites/default/files/download/publication/Model_BH_Report_January%202019_Final.pdf.
- 16** See note 7 above.
- 17** See note 8 above.

- 18** Reif, Sharon, Acevedo, Andrea, Garnick, Deborah W., & Fullerton, Catherine. 2017. Reducing behavioral health inpatient readmissions for people with substance use disorders: Do follow-up services matter? Washington, D.C.: Psychiatric Services. Vol. 68, No. 8, pp. 810–818. doi:10.1176/appi.ps.201600339.
- 19** Massachusetts Center for Health Information and Analysis. 2016. Behavioral Health and Readmissions in Massachusetts Acute Care Hospitals. Boston, MA: Center for Health Information and Analysis. Available from: <https://www.chiamass.gov/behavioral-health-and-readmissions-in-massachusetts-acute-care-hospitals/>.

- 20** See note 9 above.
- 21** Please see [technical appendix](#) for more information.
- 22** See note 3 above.
- 23** See note 3 above.
- 24** See note 3 above.



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