Hospital-Wide Adult All-Payer Readmissions In Massachusetts:

SFY 2011-2021

February 2023

CHIA.

Executive Summary

A hospital readmission is defined as an admission to a hospital within 30 days of a prior hospitalization. While there are some situations in which a second hospitalization within that time frame is part of a predetermined plan of care, the vast majority of readmissions are unplanned. Unplanned hospital readmissions can be used as an indicator of health system performance, and have been a key measure of health system quality and value since the Affordable Care Act was passed in 2010. In service of its mission to provide publically available information about the quality, affordability, utilization, access, and outcomes of the Massachusetts health care system, the Massachusetts Center for Health Information and Analysis (CHIA) reports on hospital-wide adult all-payer unplanned readmissions using CHIA's Hospital Inpatient Discharge Database.[1]

This report is the eighth in CHIA's annual series of readmissions reports and includes data through State Fiscal Year (SFY) 2021 (July 1, 2020 – June 30, 2021). The COVID-19 pandemic continues to disrupt the health care system and affect acute care hospital utilization in historically unprecedented ways. To better understand the continued impacts of the COVID-19 pandemic on acute care utilization during this time period, we report both annual and quarterly trends for SFY 2021 and include a section on COVID-19 readmissions.

In addition to analyses on the impact of COVID-19 on readmissions, this report includes updated methodology to incorporate the impact of social risk factors on readmission rates, based on the recommendations of an expert committee.[2] Since hospitals serve different patient populations, adjustments for social risk factors provide a more equitable basis for comparison of hospital performance. Historical rates presented in this report differ from earlier publications due to methodological updates. ■

Key Findings

The unplanned, all-payer readmission rate stayed the same from 2020 to 2021 (16.0%).

Medicare and Medicaid patients had higher readmission rates (18.2%, 17.0%) than commercially insured patients (10.3%).

Medicare patients age 65 and over had the most readmissions compared to other payer age groups.

Medicare patients under age 65 had the highest rates of readmission (23.3%) compared to other payer age groups.

Patients with four or more hospitalizations within 12 months accounted for half (50%) of all readmissions.

Readmission rates for patients hospitalized with any diagnosis of COVID-19 were consistently lower than for patients hospitalized for reasons other than COVID-19, 11.7% vs. 15.6%, respectively, in the last quarter of SFY 2021.

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Introduction

A hospital readmission is defined as an admission to a hospital within 30 days of a prior hospitalization. While there are some situations in which a second hospitalization within that time frame is part of a predetermined plan of care, the vast majority of readmissions are unplanned. Unplanned hospital readmissions can be used as an indicator of health system performance, and have been a key measure of health system quality and value since the Affordable Care Act was passed in 2010.

The Centers for Medicare and Medicaid Services measures hospital readmission rates for Medicare fee-for-service beneficiaries and uses readmission rates in measures of hospital quality[3] and for purposes of rewarding[4] or penalizing performance.[5]

Readmissions are not limited to Medicare fee-for-service beneficiaries. To understand readmissions in Massachusetts, the Center for Health Information and Analysis (CHIA) produces annual reports on all-cause, all-payer unplanned readmissions for all adult non-obstetric patients discharged from acute care hospitals.

This report is the eighth in CHIA's annual series of readmissions reports and updates previous reports with data from State Fiscal Year (SFY) 2021 (July 1, 2020 to June 30, 2021). This report includes enhanced quarterly-level detail on hospital utilization and readmissions during the period of the COVID-19 pandemic, from SFY 2019 to 2021, and a section on COVID-19 readmissions. In addition, this report includes an updated risk adjustment methodology to incorporate

the impact of social risk factors on readmission rates, based on the recommendations of an expert committee.[6] Since hospitals serve different communities, adjustments for social risk factors provide a more equitable basis for comparison of hospital performance. Due to methodological changes, historical rates presented in this report differ from earlier publications.

This report presents annual trends in statewide all-payer readmissions for the past eleven years, quarterly trends in statewide all-payer readmissions for SFY 2019 and 2021, readmissions by characteristics of patients and hospitalizations, readmission rates for COVID-19 and non-COVID-19 discharges, and readmission rates for individual hospitals and groups of hospitals. ■

Overall Trends in All-Payer Readmissions

This section presents overall trends in all-payer readmissions for acute care hospitals in Massachusetts for the eleven-year study period spanning July 1, 2010 to June 30, 2021. A readmission is defined as an unplanned hospitalization for any reason within 30 days of an eligible discharge. This measure excludes certain categories of hospitalizations, such as pediatric, obstetric and psychiatric admissions. Observed readmission rates are calculated as the number of readmissions that occurred within a given time period as a proportion of all eligible discharges in that time period. Observed readmission rates are useful for identifying opportunities for improvement and tracking performance over time within individual hospitals. With observed hospital readmission rates, some portion of differences among hospitals may be attributable to differing service mix and patient case mix. Unless otherwise noted, the readmission rates presented in this report are observed readmission rates. ■

Key Findings:

- Readmission rates remained the same from 2020 to 2021 (16.0%).
- Discharges dropped by 1.4% in 2021 during the COVID-19 pandemic.
- The average length of stay for a discharge resulting in a readmission was 1.7 days longer than for discharges that did not result in a readmission.

Annual Trends in Statewide All-Payer Readmission Rate, Discharges, and Readmissions
SFY 2011-2021

After an initial period of decline from 2011-2014, all-payer readmission rates have increased since 2014. In 2020 and 2021, the readmission rate was 16.0%.

The statewide number of eligible discharges has declined over time, especially since the start of the COVID-19 pandemic.

Note: Due to technical changes, readmission rates may not match those from earlier reports. Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2010 to June 2021.

Quarterly Trends in Statewide All-Payer Readmission Rate, Discharges, and Readmissions

SFY 2019-2021

Readmission rates, discharge volume, and total readmissions were stable prior to March 2020. Discharge volume sharply decreased in April 2020 and stayed below pre-pandemic levels through June 2021.

KEY
- ○ Eligible Discharges
- ○ Readmissions

Note: Due to technical changes, readmission rates may not match those from earlier reports. Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information. Each data point represents one quarter of the calendar year (three months of data); the month listed is the first month of each quarter.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2018 to June 2021.

Annual Trend in Average Length of Stay (ALOS) by Readmission Status

SFY 2011-2021

Average length of stay (ALOS) has increased overall and hospitalizations that resulted in readmissions consistently have longer average lengths of stay than hospitalizations that did not result in readmissions.

The ALOS for a discharge resulting in a readmission was 1.7 days longer than for discharges that did not result in a readmission in 2021.
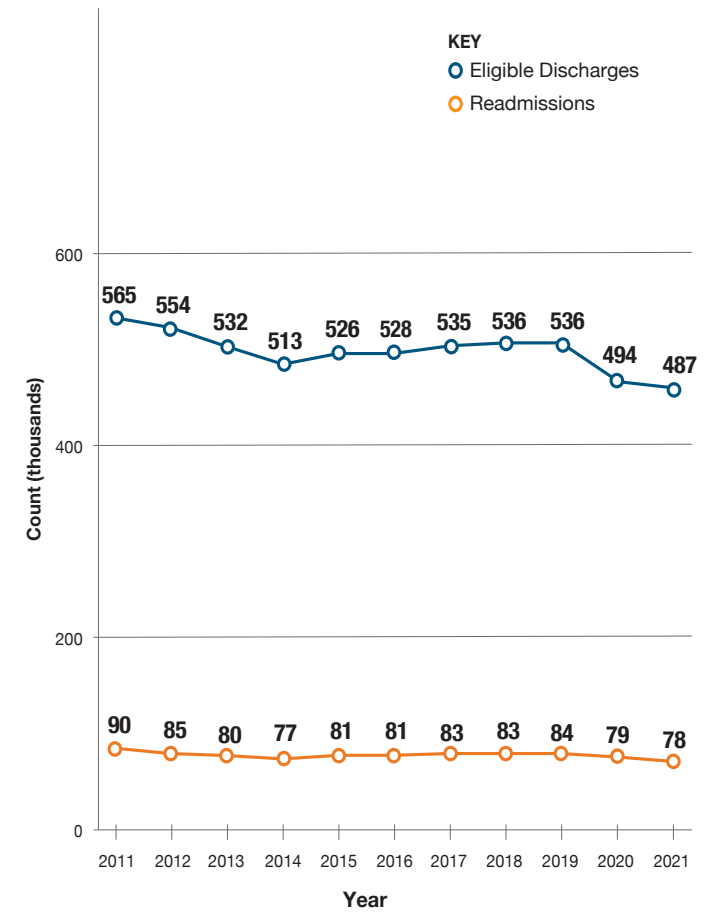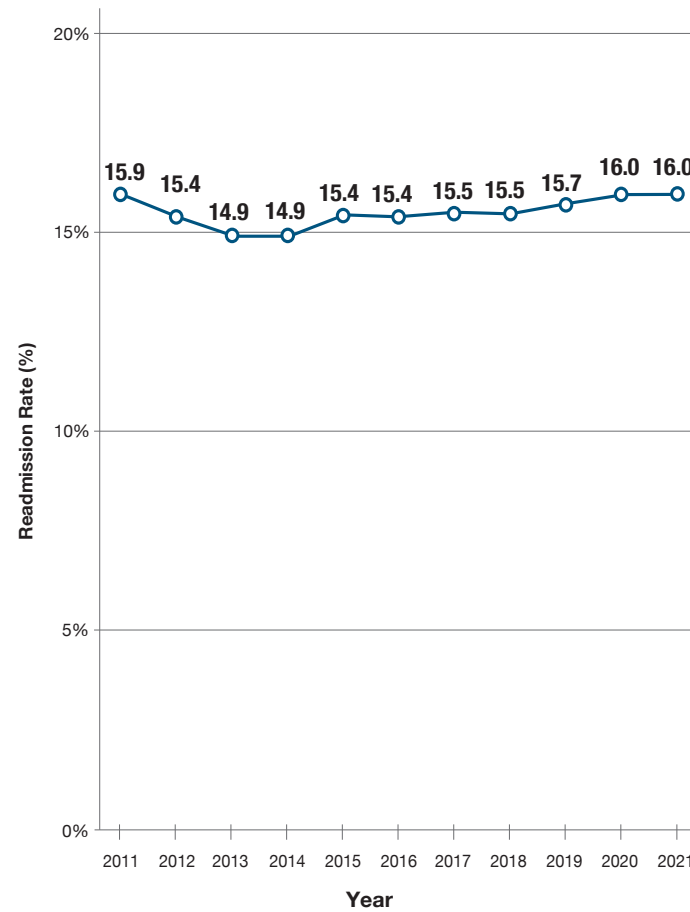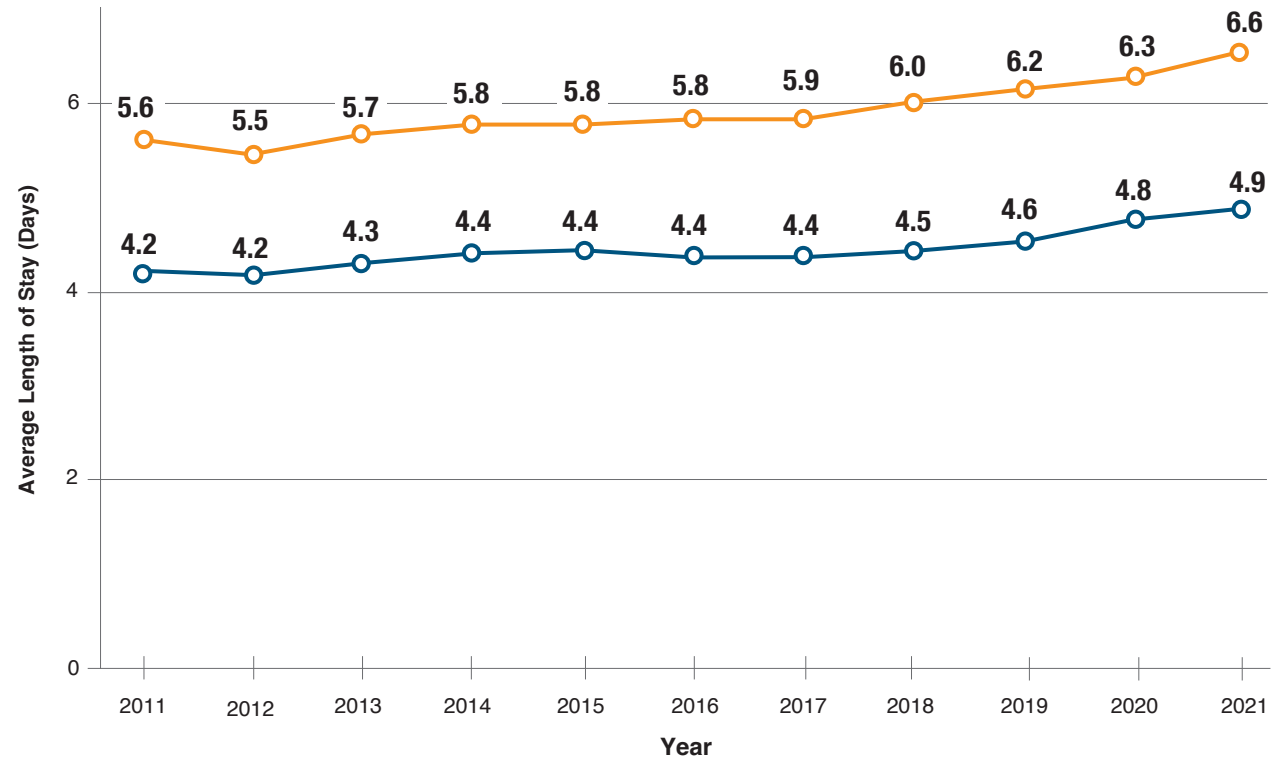

KEY

○ Discharges with Readmission

○ Discharges with No Readmission

Note: The average length of stay (ALOS) was calculated as the difference in the number of days between the discharge date and the admission date.

Due to technical changes, readmission rates may not match those from earlier reports. Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.
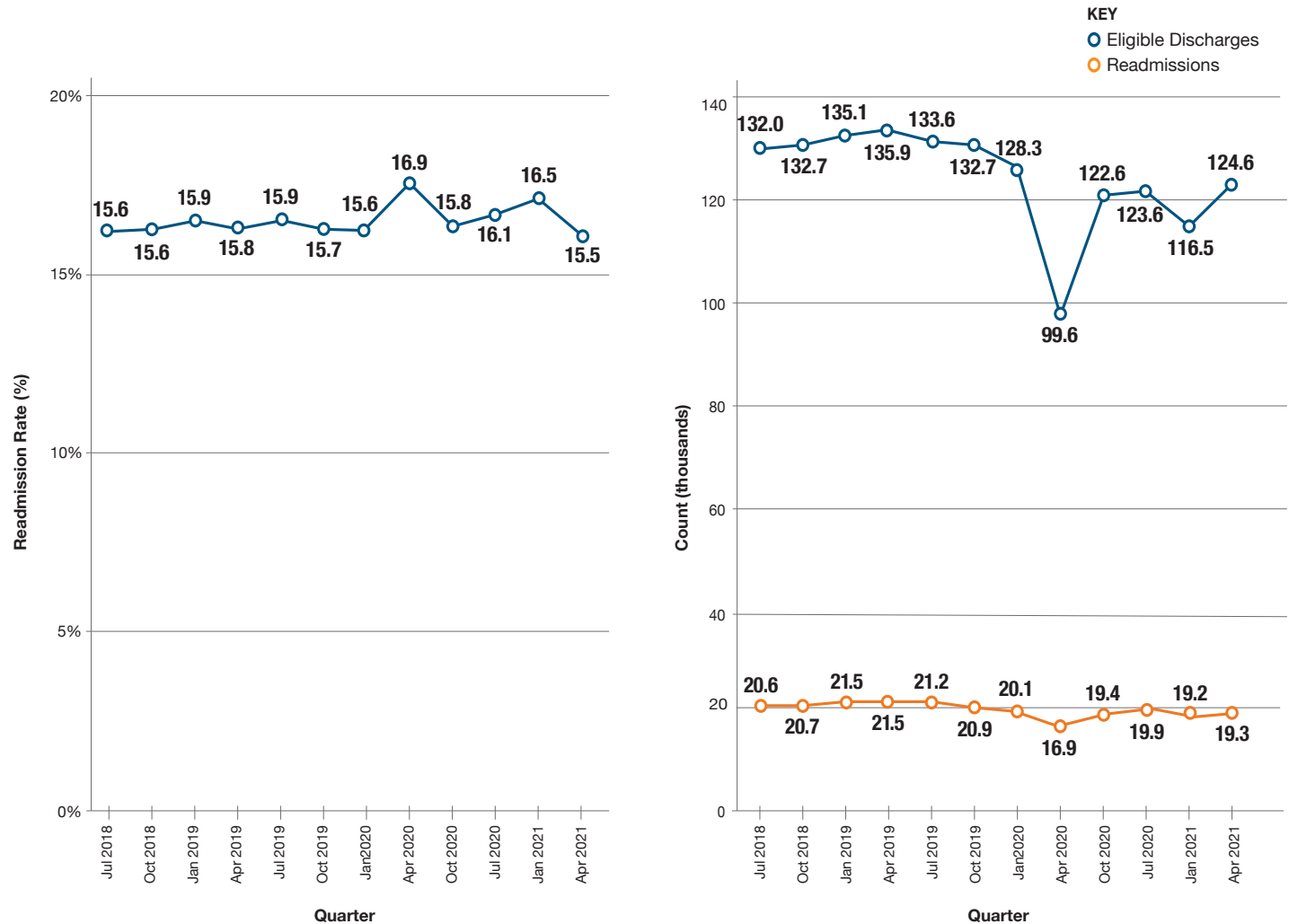
Data source: Massachusetts Hospital Inpatient Discharge Database, July 2010 to June 2021.

All-Payer Readmissions by Characteristics of Patients and Hospitalizations

This section presents observed readmission rates by several characteristics of patients and hospitalizations, such as patient age, expected payer type, discharge setting, primary discharge diagnosis, and prior inpatient utilization. ◼

Key Findings:

- Medicare and Medicaid patients had higher readmission rates than patients with commercial insurance (18.2%,17.0%, and 10.3%, respectively).

- Medicare patients age 65 and over had the most readmissions; Medicare patients under 65 had the highest rates of readmission (23.3%).

- Frequently hospitalized patients, defined as those with four or more hospitalizations within 12 months, accounted for half (50%) of all readmissions.

Readmissions peak within two days following discharge and steadily decrease over time.

Thirty-seven percent of all readmissions occur within the first week post-discharge.
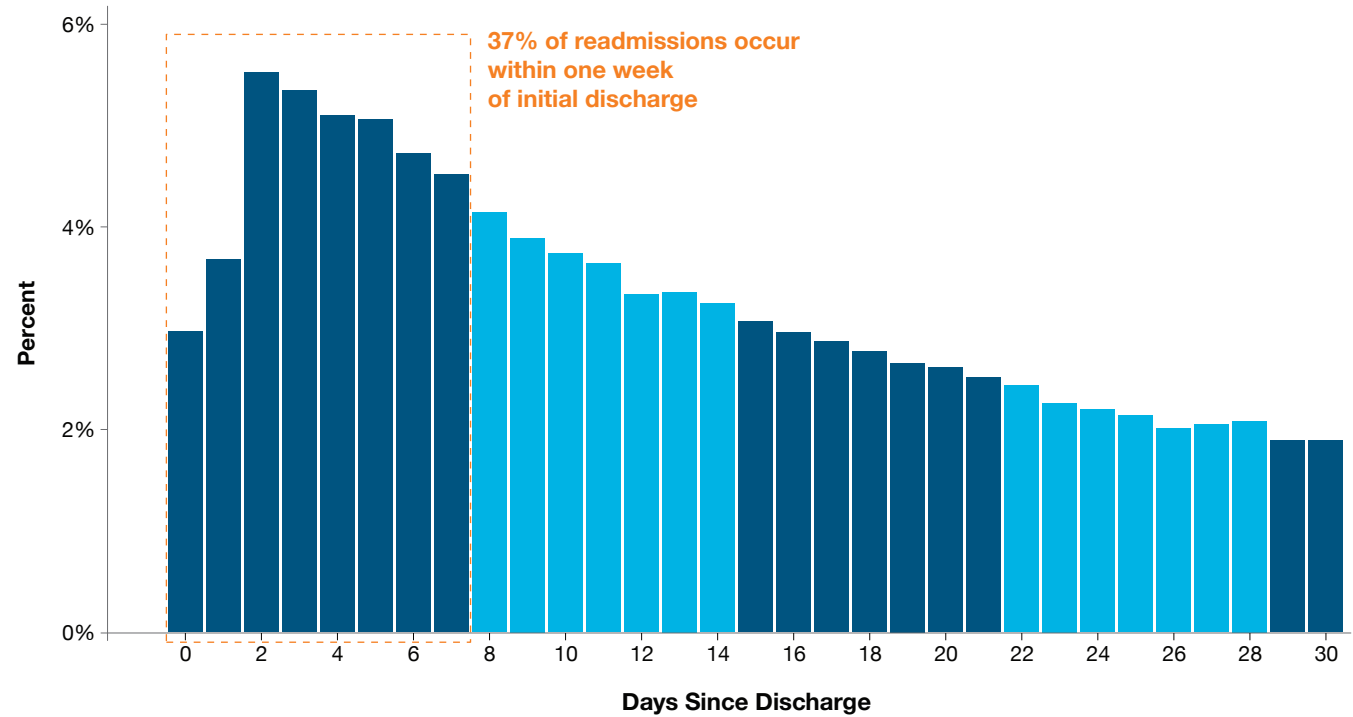
All-Payer Readmissions by Days Since Discharge
SFY 2021

37% of readmissions occur within one week of initial discharge

Note: Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

All-Payer Readmissions by Characteristics of Patients and Hospitalizations

About 59% of readmissions occurred among patients aged 65 and older, and 41% of readmissions occurred among patients under age 65.

Readmission rates for adults ages 35-64 were similar to readmission rates for adults ages 65-74. Rates were highest for adults over age 75.
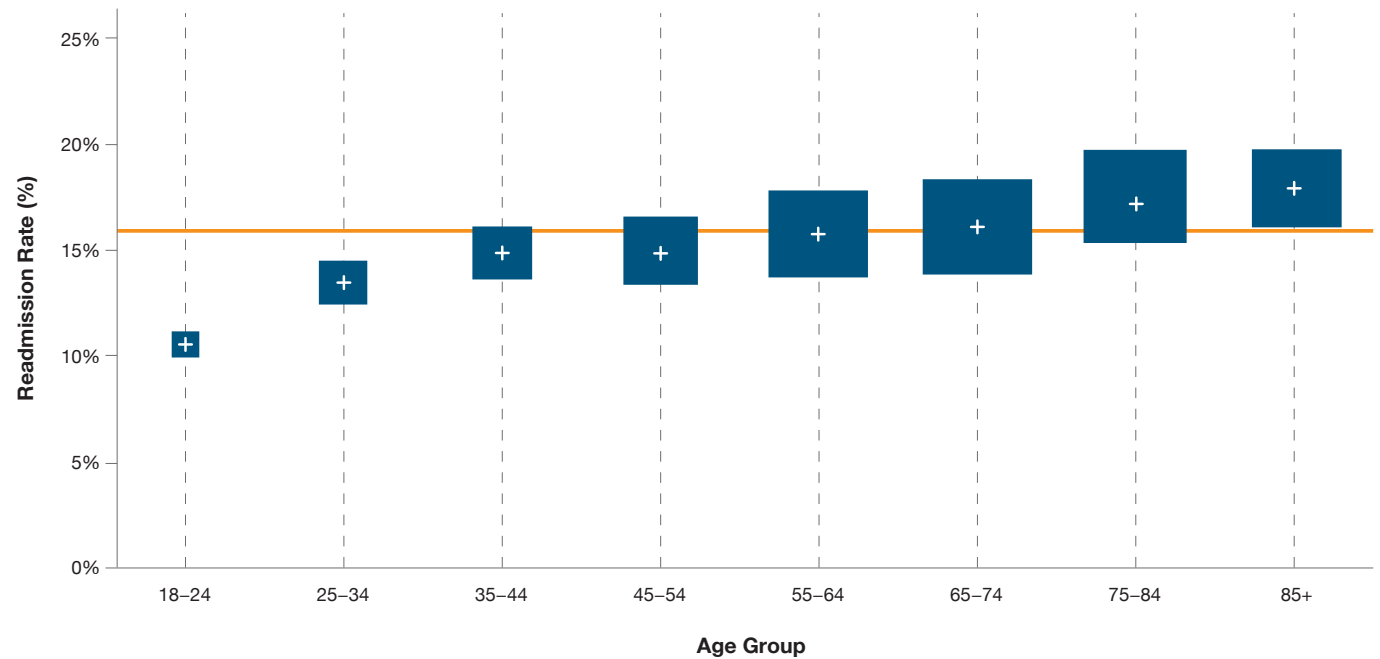
All-Payer Readmissions by Patient Age Group
SFY 2021

KEY

Size of square is proportional to number of readmissions.

⬛ = 10,000 readmissions

━━━ = Statewide rate

Note: The size of the squares is proportional to the number of readmissions.

Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

Annual Trend in All-Payer Readmissions by Patient Age Group
SFY 2011-2021

The trend in readmission rates varies by patient age group. After a period of declining readmission rates from 2011-2014, rates for patients aged 65+ have increased since 2014.

Readmission rates for patients aged 35-44 and 55-64 have increased since 2018.

Note: Due to technical changes, readmission rates may not match those from earlier reports. Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2010 to June 2021.

Medicare patients had the most readmissions. Medicare and Medicaid patients had higher readmission rates than patients with commercial insurance (18.2%, 17.0%, and 10.3%, respectively).

All-Payer Readmissions by Payer Type

SFY 2021

KEY
Size of square is proportional to number of readmissions.

= 10,000 readmissions

= Statewide rate

Eleven-Year Trend

State Fiscal Year, 2011 to 2021

Note: The size of the squares in the top figure is proportional to the number of readmissions. Self-pay and other payer type categories were not included due to small number of discharges.

Due to technical changes, readmission rates may not match those from earlier reports. Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

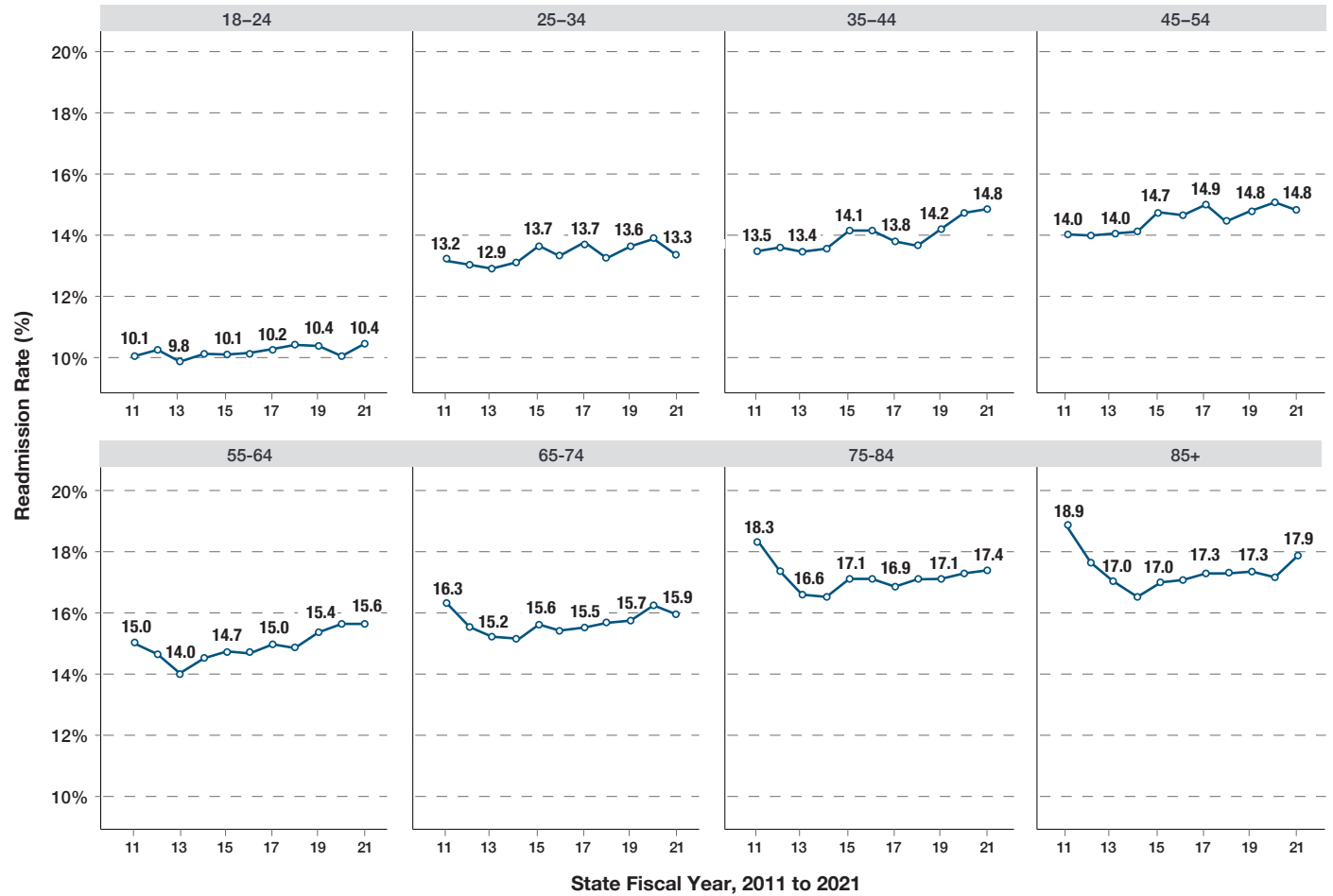Data source: Massachusetts Hospital Inpatient Discharge Database, July 2010 to June 2021.

All-Payer Readmissions by Payer Type and Patient Age Group
SFY 2021

Medicare patients under age 65 had the highest rates of readmissions (23.3%) of any payer group, followed by Medicaid patients aged 65+.

Medicare patients aged 65+ and Medicaid patients aged 18-64 had similar rates of readmissions.
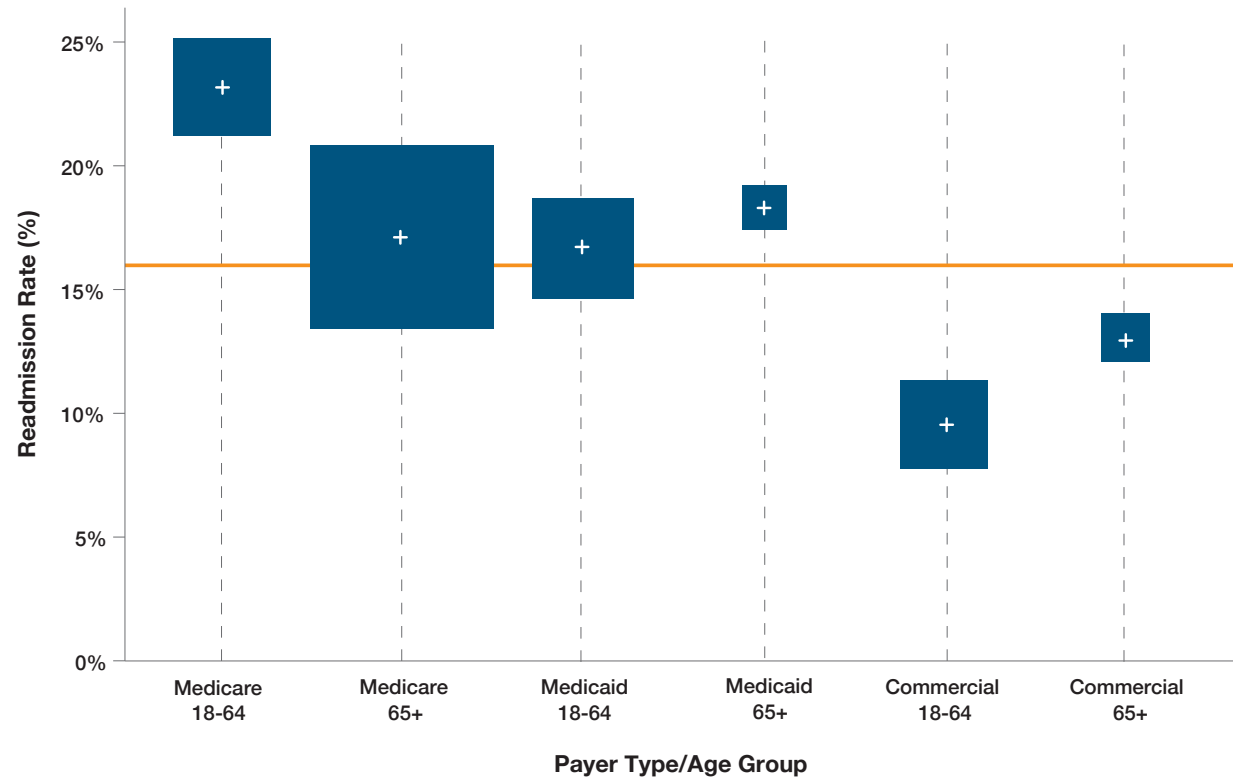
KEY
Size of square is proportional to number of readmissions.

■ = 10,000 readmissions

━━ = Statewide rate

Note: The size of the squares is proportional to the number of readmissions. Self-pay and other payer type categories were not included due to small number of discharges. Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

Readmission rates for Medicare patients aged 18-64 and Medicaid patients aged 65+ have increased since 2018.
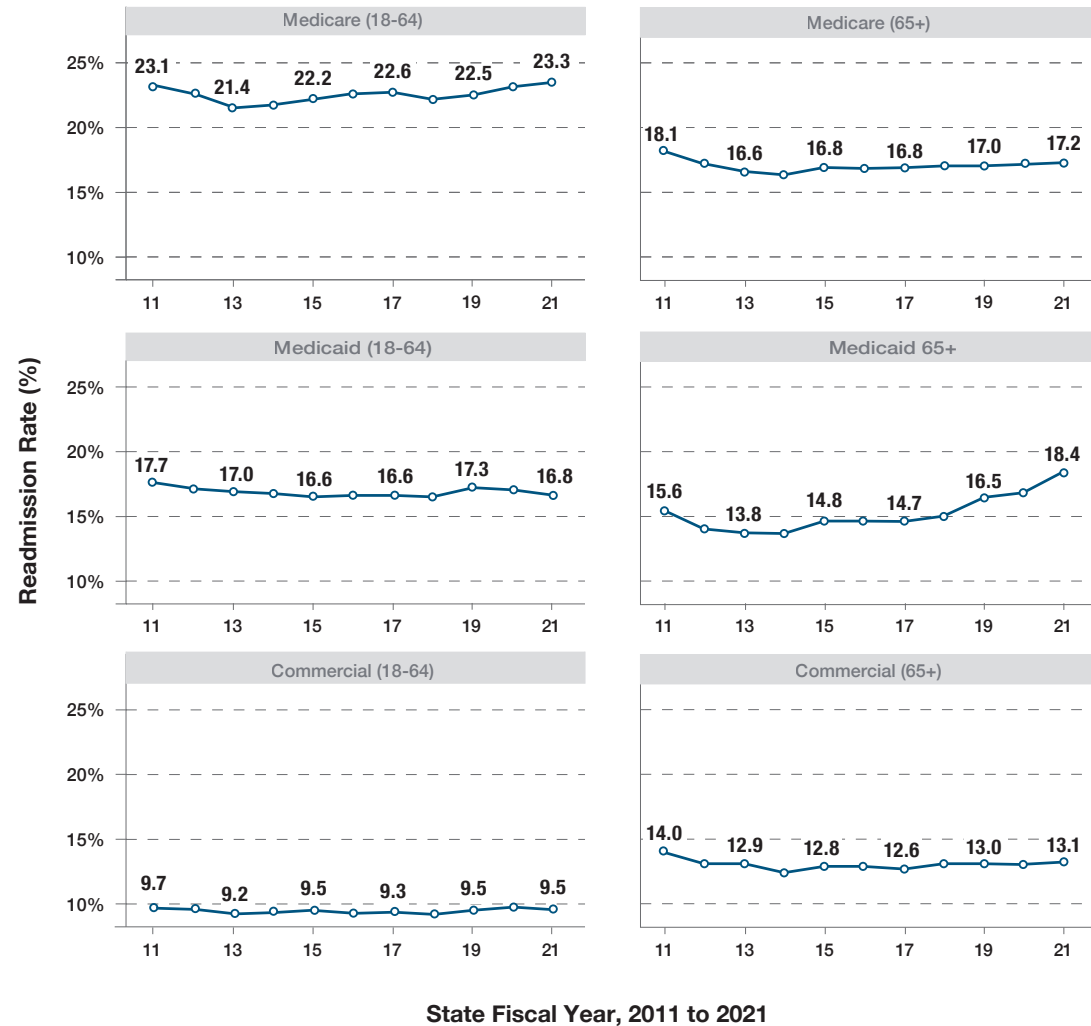
Annual Trend in All-Payer Readmissions by Payer Type and Patient Age Group

SFY 2011-2021

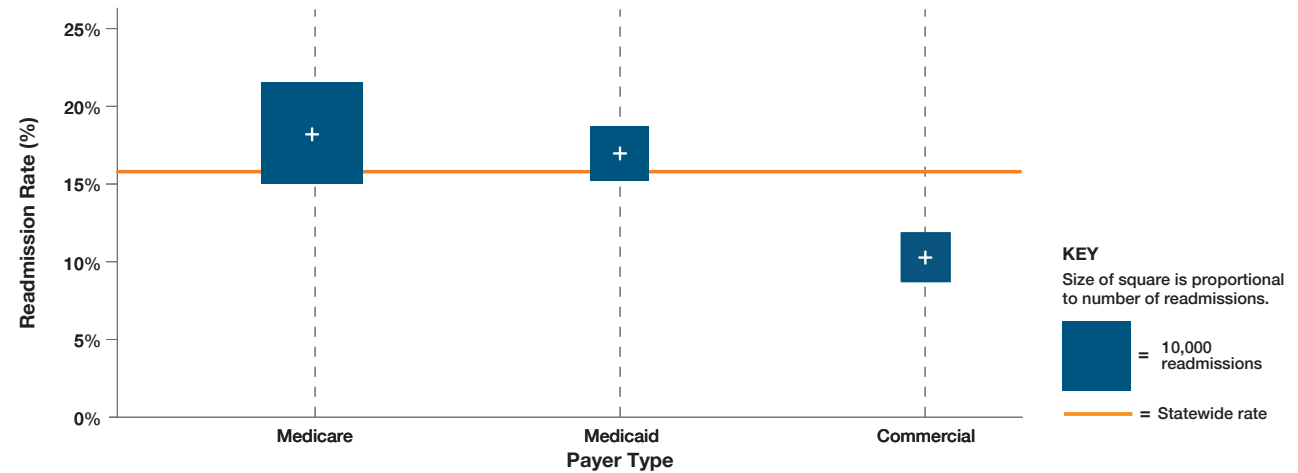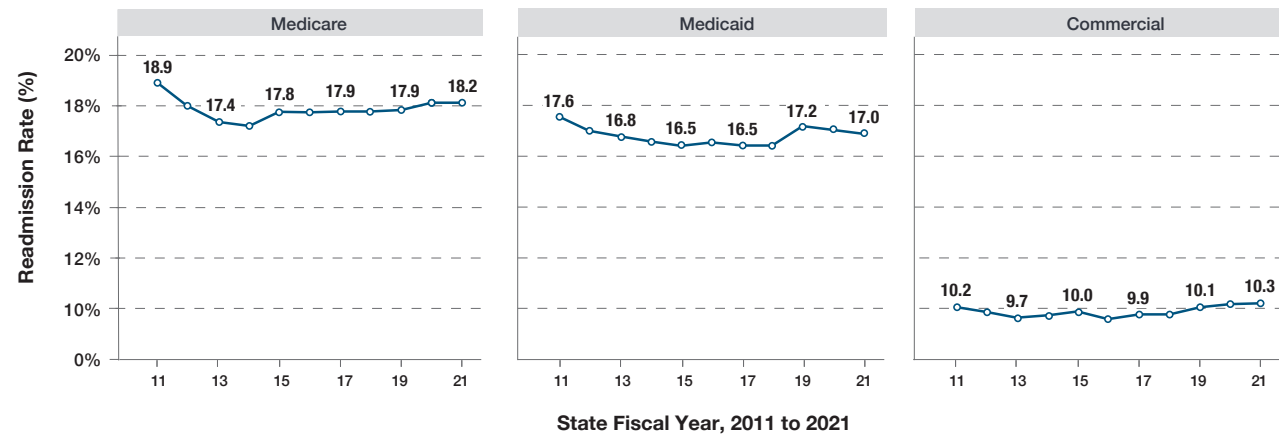**Readmission Rate (%)**

State Fiscal Year, 2011 to 2021

Note: Due to technical changes, readmission rates may not match those from earlier reports. Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2010 to June 2021.

Patients discharged home had the lowest readmission rates (12.1%) compared to patients discharged home with home health (HHA) (18.5%), to skilled nursing facilities (SNF) (20.9%), or to inpatient rehab (19.0%).

While the readmission rate for patients discharged to home has remained low over time, readmission rates for patients discharged to HHA and SNF have increased in recent years. Readmission rates for patients discharged to rehabilitation have decreased over the past few years.

All-Payer Readmissions by Discharge Setting

SFY 2021
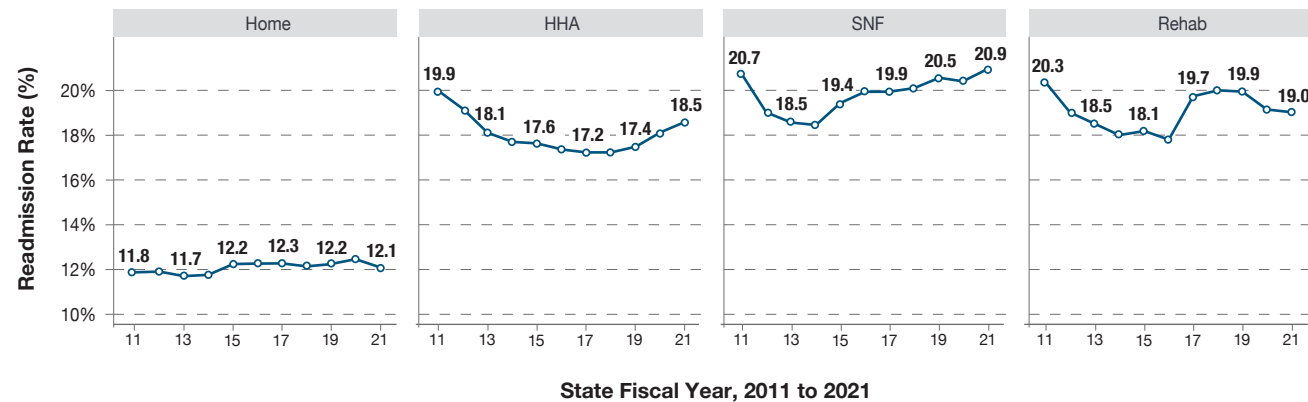
KEY

Size of square is proportional to number of readmissions.

■ = 10,000 readmissions

— = Statewide rate

Eleven-Year Trend

Note: The size of the squares in the top figure is proportional to the number of readmissions. HHA = home with home health agency care, SNF = skilled nursing facility. Hospice discharges were not included due to its small number of discharges.

Due to technical changes, readmission rates may not match those from earlier reports. Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

Heart failure, sepsis and major respiratory infections led to the most readmissions, followed by alcohol-use related conditions.*

The top 10 discharge diagnoses leading to the highest number of readmissions only accounted for one-third (34%) of all readmissions.

Discharge Diagnoses with the Highest Number of Readmissions
SFY 2021

Number of Discharges and Readmissions

KEY	
┈	= Discharges
■	= Readmissions

Top 10 Diagnoses **26,116** (34%) Other Diagnoses **51,690** (66%)

Statewide Number of Readmissions (%)

^Contains COVID-19 discharges

*Refers to APR DRG version 30.0 category "Alcohol Abuse & Dependence"

Note: The discharge diagnosis and description are based on APR DRG version 30.0. Some discontinuity in trend by diagnosis may be attributed to the change in diagnostic coding from ICD-9-CM to ICD-10-CM in October 2015.

Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

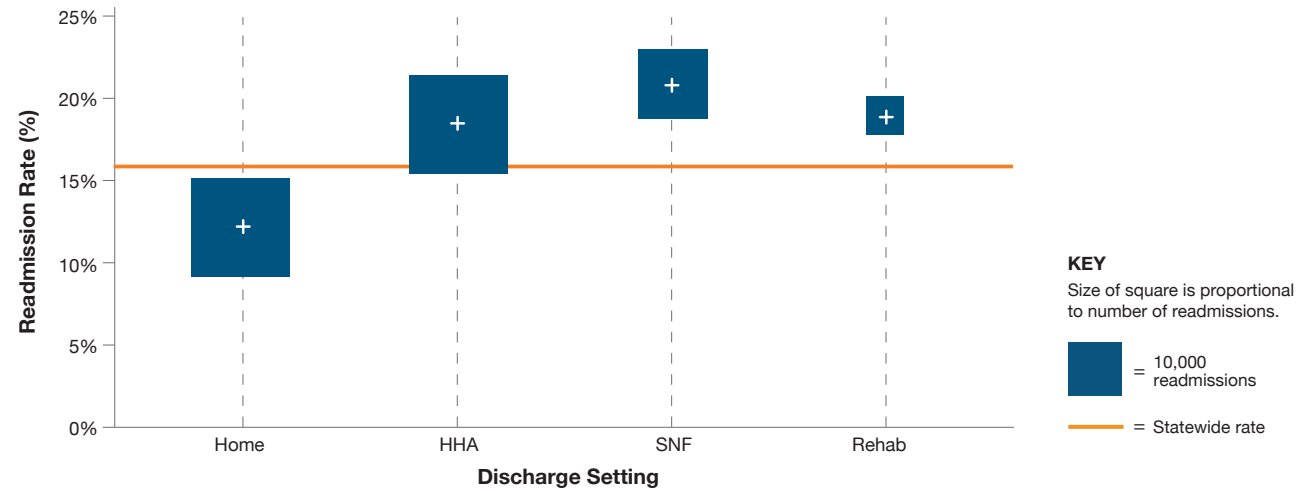Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

Annual Trend in Discharge Diagnoses with the Highest Number of Readmissions

SFY 2011-2021

Notable increases in readmission rates in 2020 and 2021 include pneumonia, COPD, and alcohol-use-related conditions.*

State Fiscal Year, 2011 to 2021

*Refers to APR DRG version 30.0 category "Alcohol Abuse & Dependence"

^Contains COVID-19 discharges

Note: The discharge diagnosis and description are based on APR DRG version 30.0. Some discontinuity in trend by diagnosis may be attributed to the change in diagnostic coding from ICD-9-CM to ICD-10-CM in October 2015.
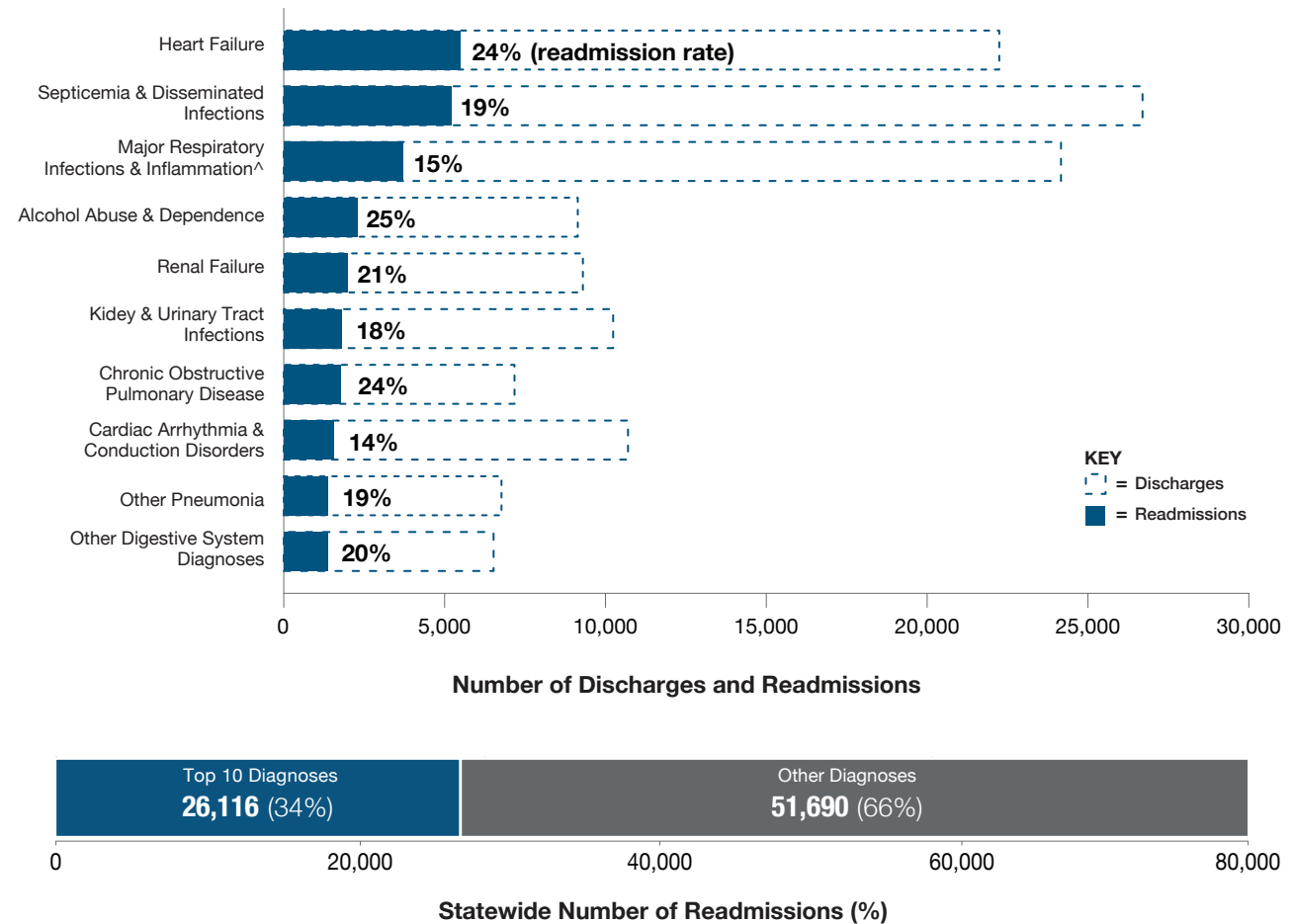
Due to technical changes, readmission rates may not match those from earlier reports. Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2010 to June 2021.

Discharge Diagnoses with the Highest Readmission Rates
SFY 2021

While it is important to identify the largest groups experiencing the most readmissions, it is also important to bring visibility to smaller groups of patients experiencing disproportionately high readmission rates.

The top 10 discharge diagnoses with the highest rates of readmission all had rates well above the statewide average of 16.0%.

Diagnosis	Readmission Rate (%)
Sickle Cell Anemia Crisis (570*)	49%
Liver Transplant and/or Intestinal Transplant (99)	37%
Hepatic Coma & Other Major Acute Liver Disorders (592)	36%
Heart and/or Lung Transplant (54)	35%
Alcoholic Liver Disease (979)	34%
Other Hepatobiliary, Pancreas & Abdominal Procedures (465)	34%
Kidney Transplant (123)	30%
Nephritis & Nephrosis (56)	29%
Other Disorders Of The Liver (339)	27%
HIV W Multiple Major HIV Related Conditions (54)	27%

Readmission Rate (%)

KEY
—— = Statewide rate

* Number of readmissions

Note: The discharge diagnosis and description are based on APR DRG version 30.0. Some discontinuity in trend by diagnosis may be attributed to the change in diagnostic coding from ICD-9-CM to ICD-10-CM in October 2015.
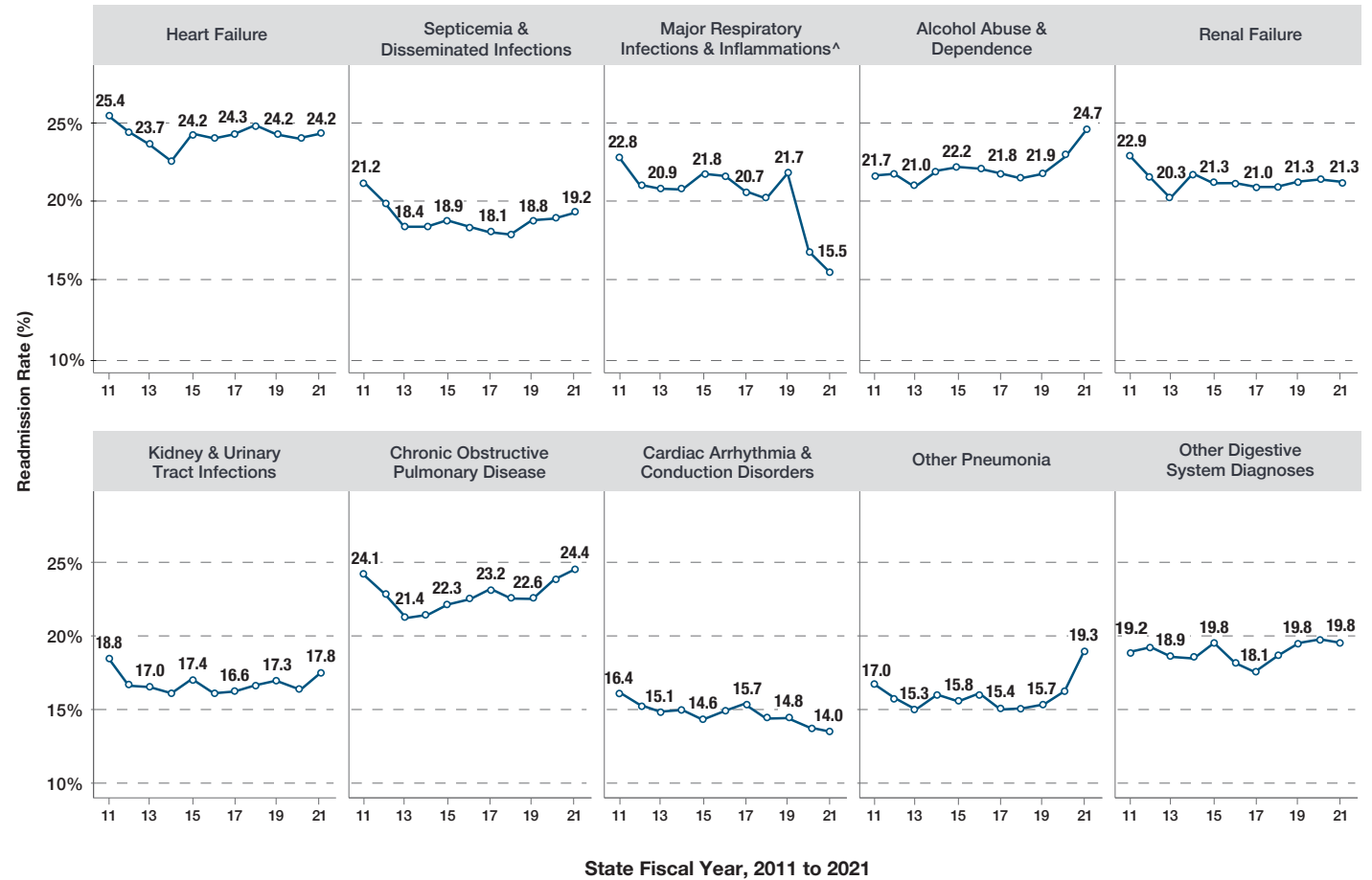
Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

Frequently hospitalized patients are defined as those with four or more hospitalizations within 12 months of their most recent discharge. This group of patients experiences a cycle of recurrent utilization.

Frequently hospitalized patients account for approximately 18% of all discharges and 50% of all readmissions. The readmission rate for frequently hospitalized patients was 44.3%, compared to 9.7% for patients who were not frequently hospitalized (data not shown).

All-Payer Readmissions Among Frequently Hospitalized Patients
SFY 2021

Patients without Frequent Hospitalizations

Patients with Frequent (4+) Hospitalizations

Note: Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

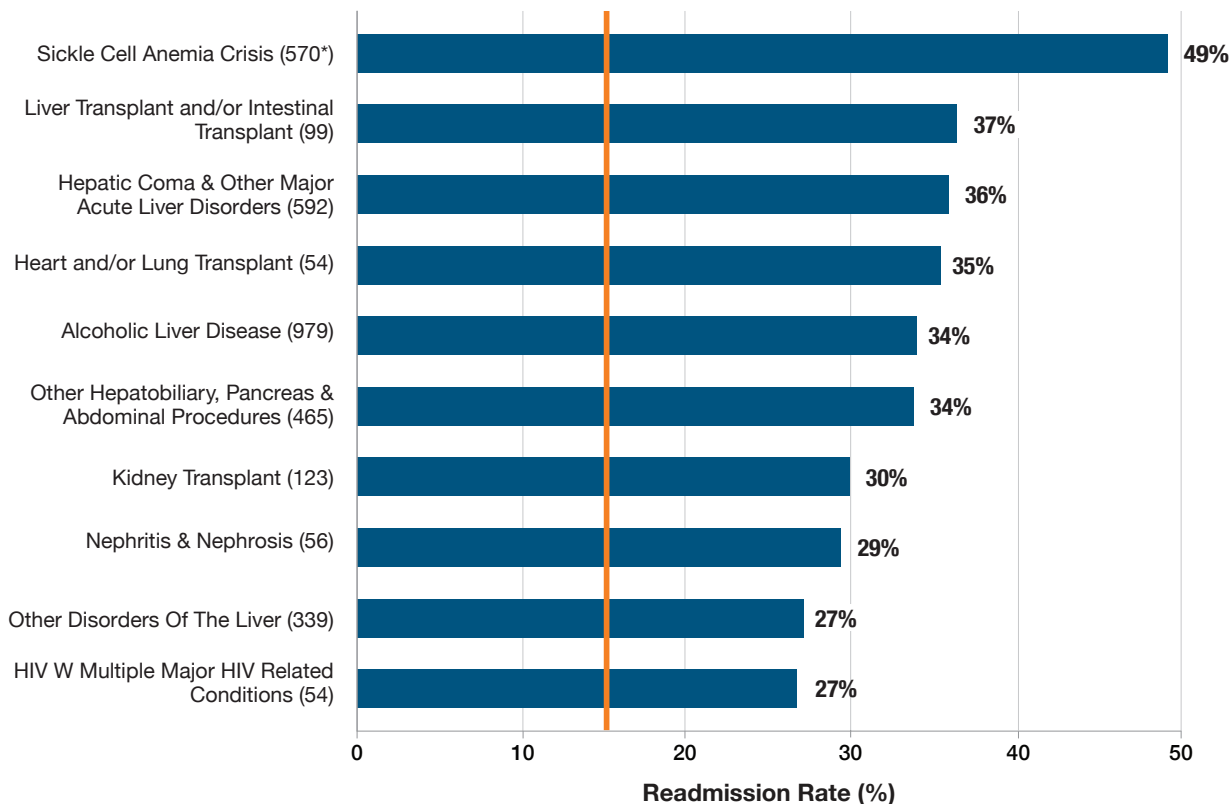Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

Percentage of Patients Frequently Hospitalized by Payer Type and Age Group

SFY 2021

In 2021, there were 18,677 patients (data not shown) who experienced four or more hospitalizations in a 12-month period.

Frequently hospitalized patients are found in different proportions across payer type and age groups.

About 85% of all frequently hospitalized patients were Medicare or Medicaid beneficiaries.

Notably, 11.5% of Medicare patients under age 65 were frequently hospitalized.

	Medicare		Medicaid		Commercial	
	18-64	65+	18-64	65+	18-64	65+
Number of Frequently Hospitalized Patients	2,885	9,492	2,934	535	1,728	559
Number of all Patients	25,020	153,234	48,017	7,056	70,262	16,857

Percent of All Frequently Hospitalized Patients
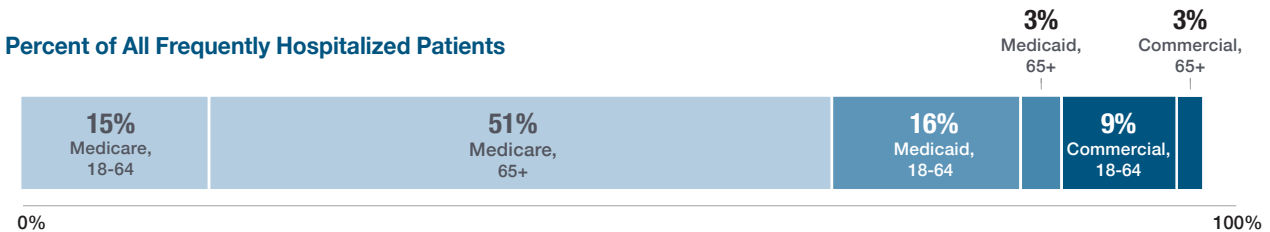
Note: Self-pay and other payer type categories were not included due to small number of discharges. Percentages may not add up to 100% due to rounding.

Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.
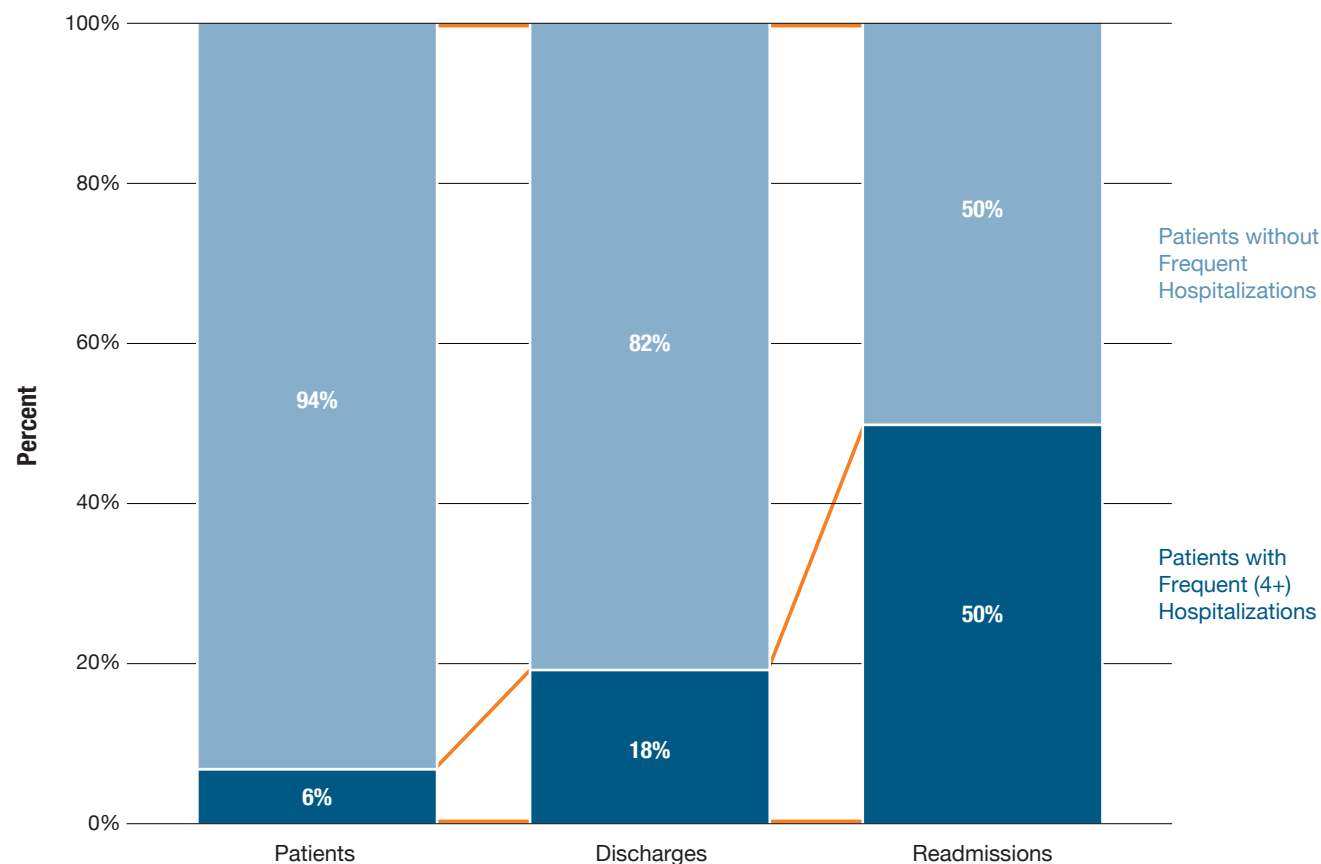
Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

The highest proportion of frequently hospitalized patients in 2021 were in Fall River, Metro South, Metro Boston, and the Lower North Shore.

Percentage of Patients Frequently Hospitalized by Patient Region
SFY 2021

KEY
Percent of Patients
Frequently Hospitalized

- 7–7.9%
- 6–6.9%
- 5–5.9%
- 4–4.9%

Note: Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

All-Payer Readmissions and COVID-19

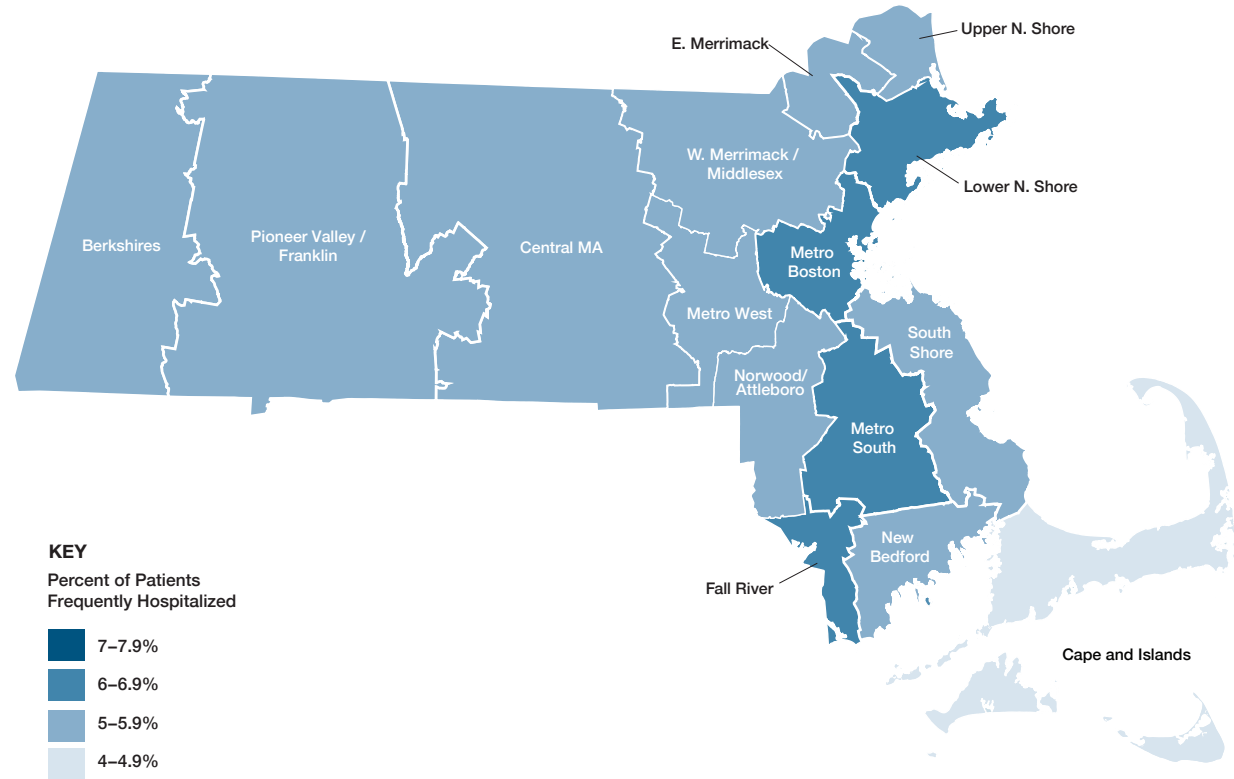The COVID-19 pandemic continues to disrupt the health care system in a variety of ways that have impacted hospital utilization. This section presents readmission rates for COVID-19 and non-COVID-19 discharges overall, as well as by patient age group and payer type.

For the purposes of this analysis, a discharge was classified as being associated with COVID-19 if it had a primary or secondary ICD-10-CM diagnosis indicating confirmed COVID-19. ■

Key Findings:

- The COVID-19 readmission rate was 11.7% in the last quarter of SFY 2021, compared to the non-COVID readmission rate of 15.6%.
- COVID-19 readmission rates were highest for patients aged 65 and over.
- For Medicaid patients, non-COVID-19 readmission rates were higher (17.3%) than COVID-19 readmission rates (12.6%)

All-Payer Readmissions and COVID-19

In April 2020, 14% of total discharges and 12% of total readmissions were associated with COVID-19. Readmission rates for non-COVID-19 discharges were higher than those for COVID-19 discharges. The readmission rate for discharges with any COVID diagnosis also declined over time, to 11.7% in the last quarter of SFY 2021, driven by the large decrease in the number of readmissions.

Most COVID-19 discharges had a primary diagnosis of COVID-19. Readmission rates for discharges with a secondary diagnosis of COVID-19 were higher than those with a primary diagnosis of COVID-19.

Quarterly Trends in All-Payer Discharges, Readmissions, and Readmission Rate by COVID-19 Status
April 2020 - June 2021
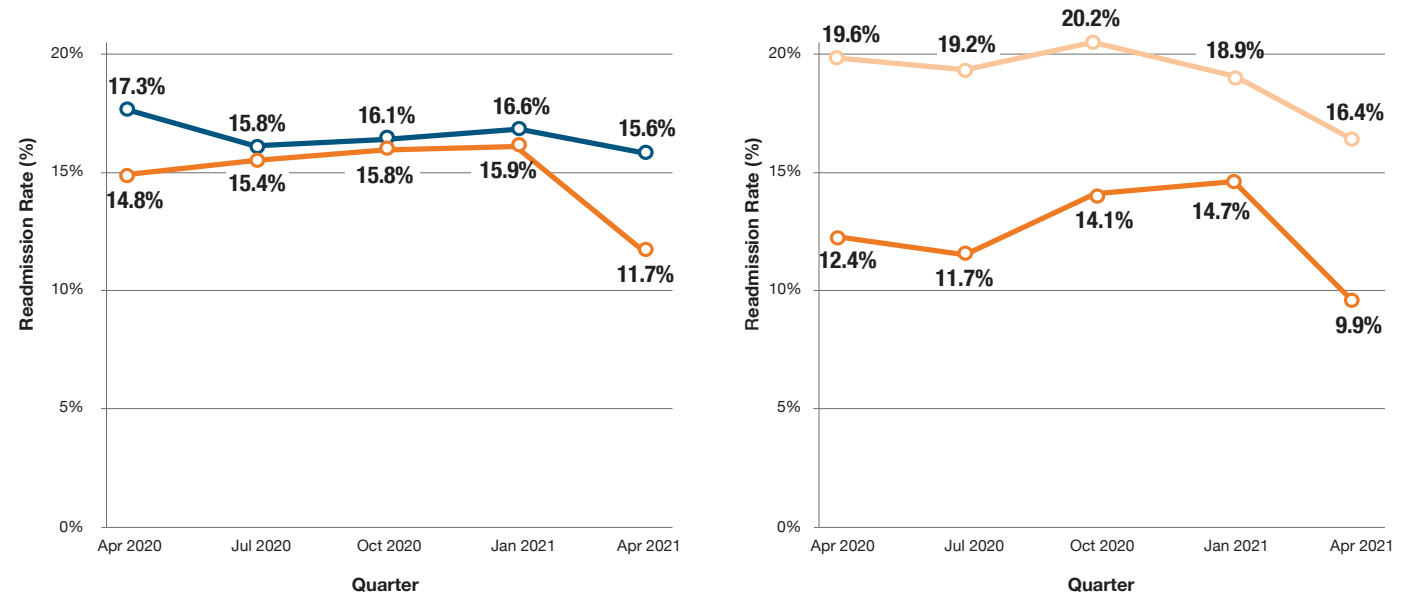
Key
- ○ Non-COVID-19
- ○ Any Diagnosis of COVID-19
- ○ Secondary Disgnosis of COVID-19
- ○ Primary Diagnosis of COVID-19

	April 2020		July 2020		October 2020		January 2021		April 2021	
	Discharges	Readmissions	Discharges	Readmissions	Discharges	Readmissions	Discharges	Readmissions	Discharges	Readmissions
Non-COVID-19	86,019	14,839	120,832	19,121	113,690	18,339	103,682	17,203	120,508	18,792
Any Diagnosis of COVID-19	13,549	2,010	1,812	279	9,861	1,554	12,791	2,040	4,082	478
Primary Diagnosis of COVID-19	8,936	1,106	920	108	7,232	1,023	8,945	1,313	2,951	292
Secondary Diagnosis of COVID-19	4,613	904	892	171	2,629	531	3,846	727	1,131	186

Note: Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

A discharge was classified as being associated with COVID-19 if it had a primary or secondary ICD-10-CM diagnosis indicating confirmed COVID-19. Each data point represents one quarter of the calendar year (three months of data); the month listed is the first month of each quarter.

Data source: Massachusetts Hospital Inpatient Discharge Database, April 2020 – June 2021.
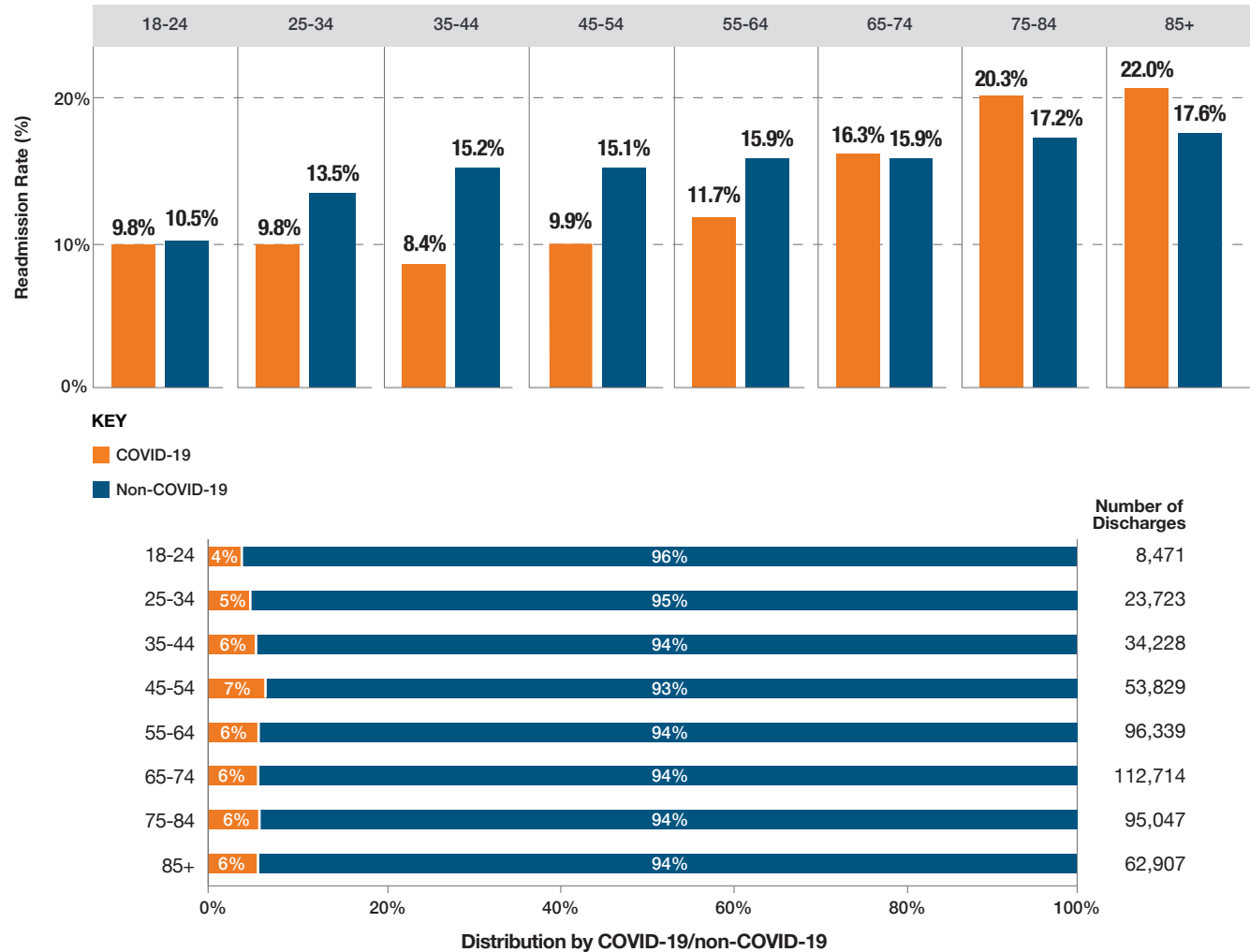
All-Payer Readmissions and COVID-19

The readmission rate for COVID-19 discharges increases with age.

Readmission rates were higher for COVID-19 discharges than non-COVID-19 discharges for patients aged 65 and over.

Readmission rates were higher for non-COVID-19 discharges for patients under age 65.

All-Payer Readmissions by Patient Age Group and COVID-19 Status
SFY 2021

Age Group	COVID-19	Non-COVID-19
18-24	9.8%	10.5%
25-34	9.8%	13.5%
35-44	8.4%	15.2%
45-54	9.9%	15.1%
55-64	11.7%	15.9%
65-74	16.3%	15.9%
75-84	20.3%	17.2%
85+	22.0%	17.6%

KEY
■ COVID-19
■ Non-COVID-19

Distribution by COVID-19/non-COVID-19

Age Group	COVID-19	Non-COVID-19	Number of Discharges
18-24	4%	96%	8,471
25-34	5%	95%	23,723
35-44	6%	94%	34,228
45-54	7%	93%	53,829
55-64	6%	94%	96,339
65-74	6%	94%	112,714
75-84	6%	94%	95,047
85+	6%	94%	62,907

Note: Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.
Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

All-Payer Readmissions and COVID-19

Readmission rates for COVID-19 discharges were lower than non-COVID-19 discharges for Medicaid and commercial patients.

All-Payer Readmissions by Payer Type and COVID-19 Status
SFY 2021

Readmission Rate (%)

Commercial	Medicaid	Medicare
8.2% / 10.4%	12.6% / 17.3%	19.7% / 18.1%

KEY
- COVID-19
- Non-COVID-19

Number of Discharges

		Number of Discharges
Commercial	6% / 94%	111,598
Medicaid	7% / 93%	81,136
Medicare	5% / 95%	274,554

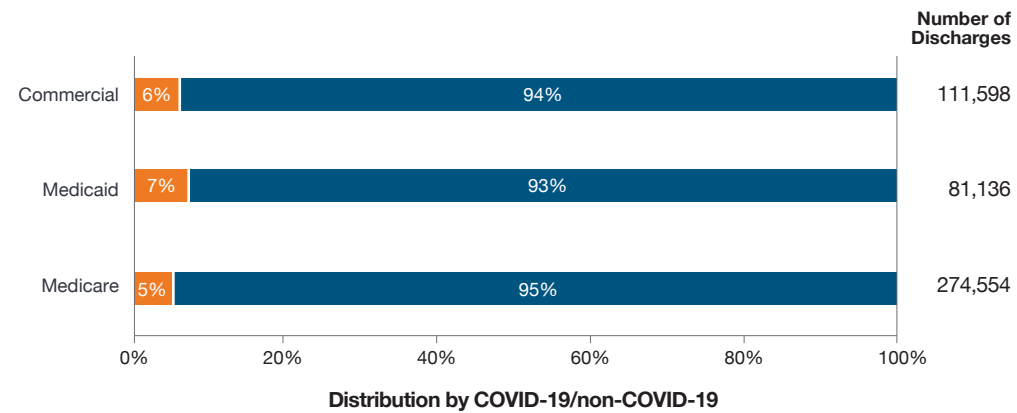**Distribution by COVID-19/non-COVID-19**

Note: Analyses include eligible discharges for adults with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

All-Payer Readmissions by Hospital

This section contains analyses of observed readmission rates and risk-standardized readmission rates (RSRRs) for individual hospitals and for groups of hospitals. RSRRs control for differences across hospitals that may influence readmission rates. Based on recommendations of an expert committee, CHIA developed an enhanced risk-adjustment methodology to account for social risk factors.[7] CHIA's risk-adjustment model adjusts for patient age, patient case mix, hospital service mix, as well as patient- and community-level social risk factors. Patient-level factors include sex, race and ethnicity, homeless status, and dual-eligibility for Medicaid and Medicare and community-level factors include indicators of poverty, food insecurity, housing instability, education, and employment. CHIA also expanded the list of behavioral health comorbidities beyond those already included in the original risk-adjustment model. By adjusting for differences in the patient populations served at each acute care hospital, the enhanced RSRRs allow for a more equitable comparison of hospital performance. For more details about the enhanced RSRRs, please see the technical appendix. ■
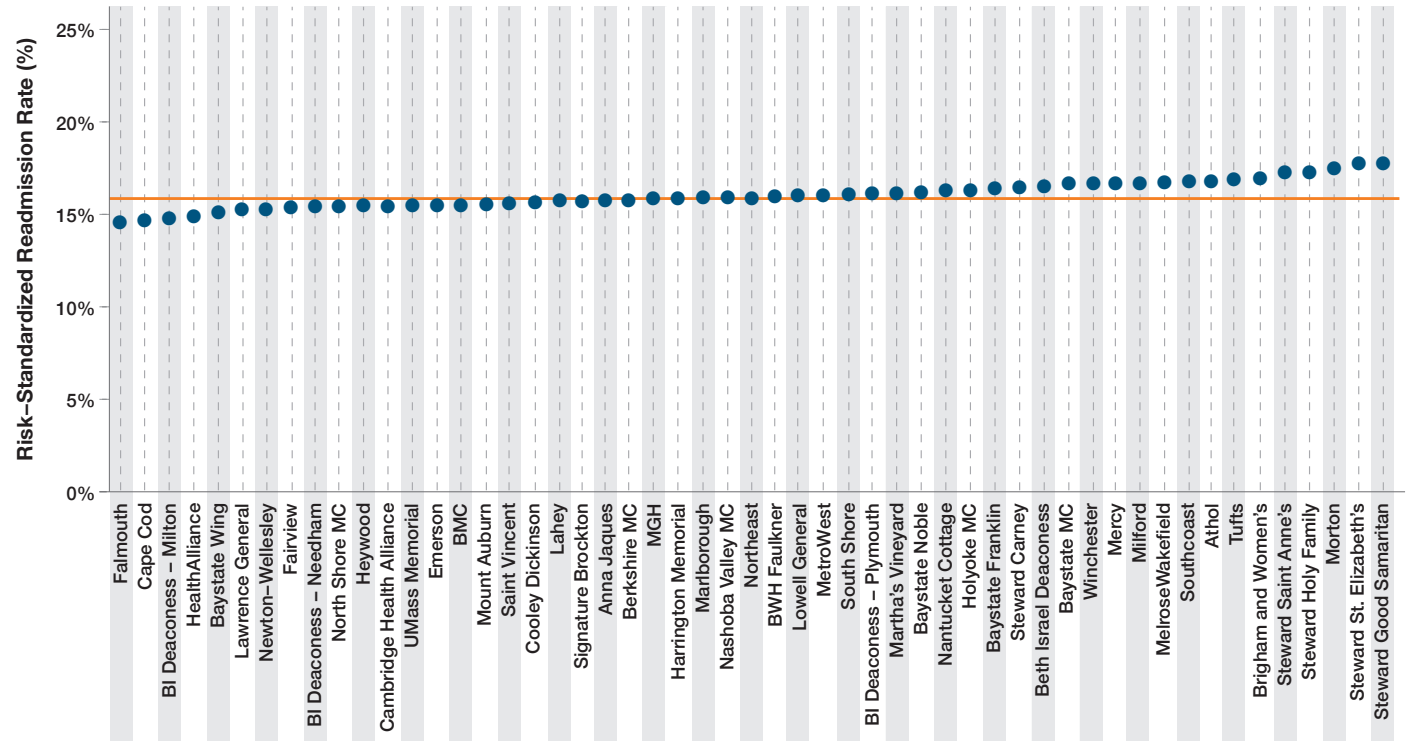
Key Findings:

- Risk-standardized readmission rates (RSRR) for all hospitals ranged from 14.6% to 17.8% in 2021.
- The difference between risk-standardized readmission rates for community hospitals vs teaching hospitals was small.
- The system with the lowest RSRR was Cape Cod Healthcare (14.7%) and highest RSRR was Steward Healthcare (17.4%).

All-Payer Risk-Standardized Readmission Rates of Acute Care Hospitals
SFY 2021

Observed hospital readmission rates ranged from 11.6% to 19.6% in 2021 (data not shown). After adjusting for patient case mix, hospital service mix, and patient and community social risk factors, RSRRs ranged from a low of 14.6% at Falmouth Hospital to a high of 17.8% at Steward Good Samaritan Medical Center.

Note: The risk-standardized readmission rates (RSRRs) shown in this figure account for patient case mix, hospital service mix, as well as patient-level and community-level social risk factors. This figure excludes specialty hospitals (New England Baptist and the Massachusetts Eye and Ear Infirmary) and Sturdy Memorial Hospital.
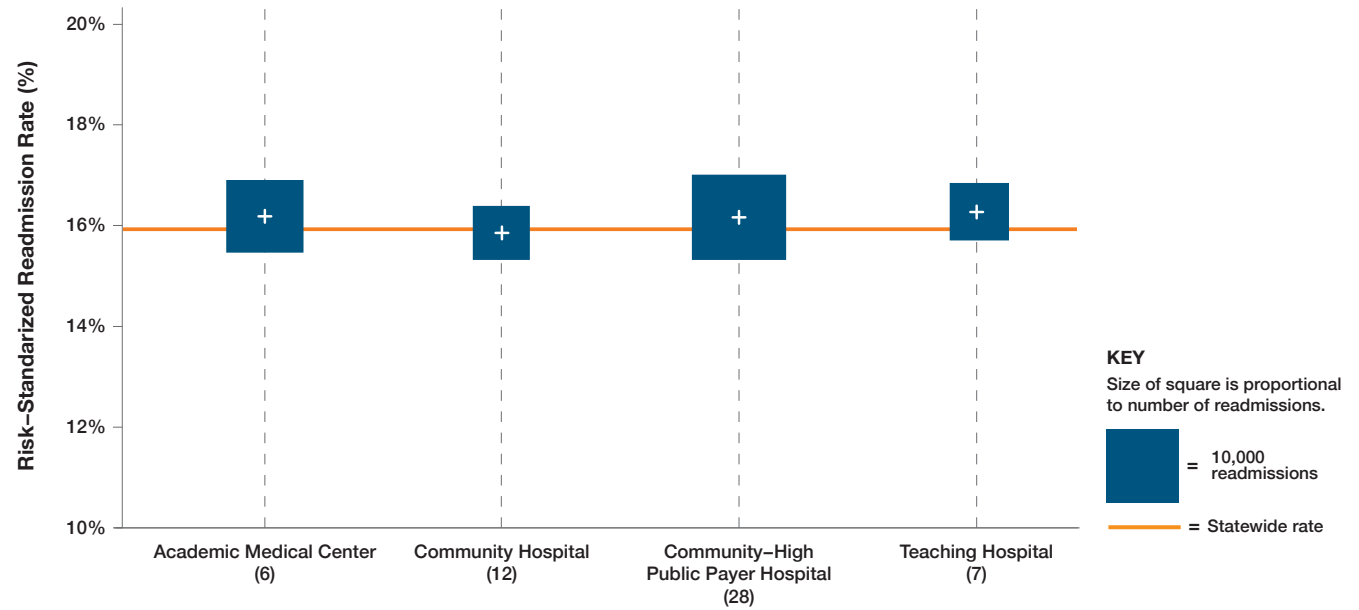
Analyses include eligible discharges for adults residing in New England and New York and with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

All-Payer Risk-Standardized Readmission Rates by Hospital Type
SFY 2021

Variation in risk-standardized readmission rates by hospital type was small, from a low of 15.9% for community hospitals to a high of 16.3% for teaching hospitals.

KEY
Size of square is proportional to number of readmissions.

= 10,000 readmissions

= Statewide rate

Note: The size of the squares is proportional to the number of readmissions.

The risk-standardized readmission rates (RSRRs) shown in this figure account for patient case mix, hospital service mix, as well as patient-level and community-level social risk factors.

Analyses include eligible discharges for adults residing in New England and New York and with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.
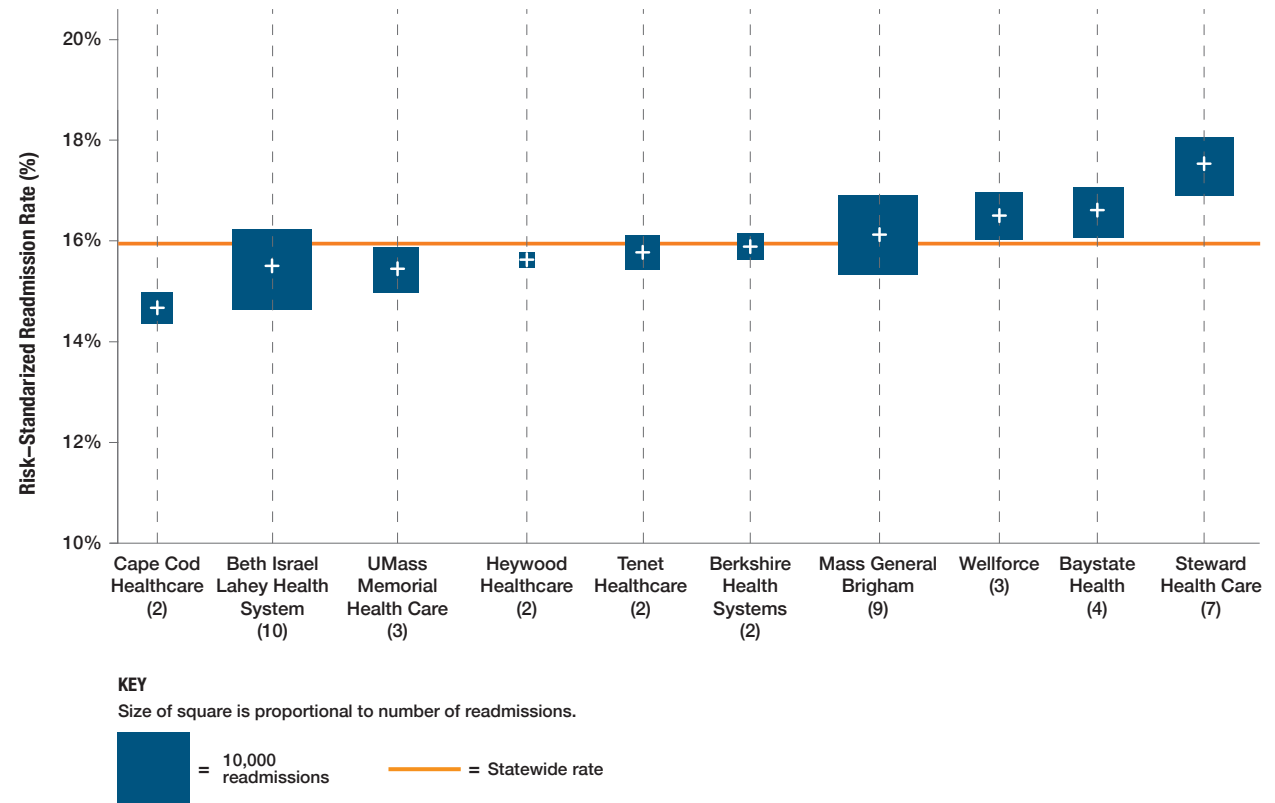
Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

All-Payer Risk-Standardized Readmission Rates by Hospital System
SFY 2021

RSRRs varied by hospital system, from a low of 14.7% for Cape Cod Healthcare to a high of 17.4% for Steward Health Care System.

KEY
Size of square is proportional to number of readmissions.

■ = 10,000 readmissions   ━━ = Statewide rate

Note: The size of the squares is proportional to the number of readmissions.

The risk-standardized readmission rates (RSRRs) shown in this figure account for patient case mix, hospital service mix, as well as patient-level and community-level social risk factors.

Analyses include eligible discharges for adults residing in New England and New York and with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

All-Payer Observed and Risk-Standardized Readmission Rates by Hospital Region

SFY 2021

The top figure shows observed readmission rates by region, and the bottom figure shows variation in risk-standardized readmission rates by region.

The observed rates varied from a low of 13.3% on the Cape and Islands to 18.6% in Fall River. The geographic variation in rates narrowed after risk-adjustment, ranging from 14.7% to 17.2%.

Observed Readmission Rates
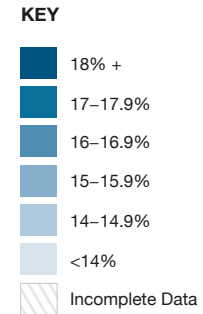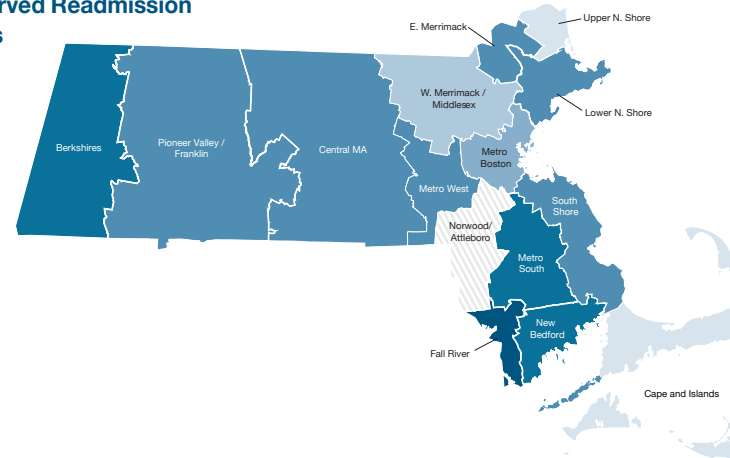
Risk-Standardized Readmission Rates
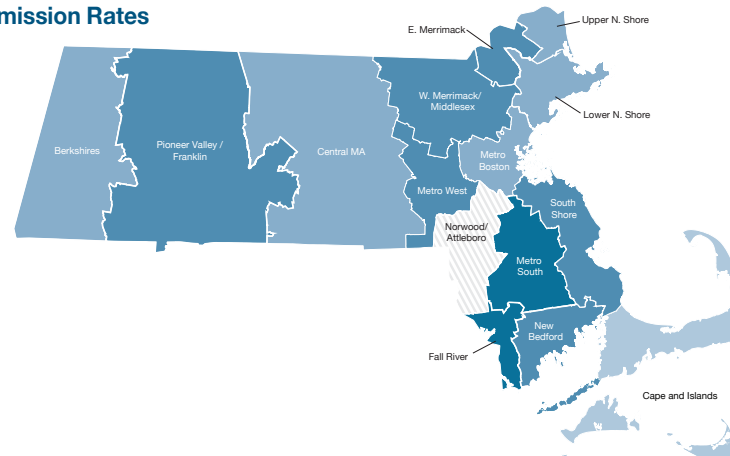
KEY

- 18% +
- 17–17.9%
- 16–16.9%
- 15–15.9%
- 14–14.9%
- <14%
- Incomplete Data

Note: The risk-standardized readmission rates (RSRRs) shown in this figure account for patient case mix, hospital service mix, as well as patient-level and community-level social risk factors. Results for the Norwood/Attleboro region are not shown due to incomplete data.

Analyses include eligible discharges for adults residing in New England and New York and with any payer, excluding discharges for obstetric or primary psychiatric care. See technical appendix for more information.

Data source: Massachusetts Hospital Inpatient Discharge Database, July 2020 to June 2021.

About the Readmissions Methodology

CHIA has adapted the Hospital-Wide All-Cause Unplanned 30-day Readmission Measure (NQF #1789) developed by CMS and the Yale Center for Outcomes Research and Evaluation to report on all-payer readmissions in the Commonwealth. The measure was applied to CHIA's Hospital Inpatient Discharge Database, which is collected from all non-federal acute care hospitals in Massachusetts.[8] This year's methodology is adapted from the 2022 CMS readmission measure specification (version 11.0), which uses the V24 CMS-HCC crosswalk and updates the planned readmissions algorithm.[9] Some discontinuity in trends may be attributable to the change in diagnostic coding from ICD-9-CM to ICD-10-CM.

A readmission is defined as an inpatient admission to an acute care facility in Massachusetts occurring within 30 days of an eligible index discharge. All readmissions are counted except for those that are considered planned.

Readmission rates are calculated in four broad steps. First, eligible hospital discharges are defined. Second, from among this set of eligible discharges, the number of eligible readmissions within 30 days is derived. Then, the latter is divided by the former and turned into a percentage to calculate the observed readmission rate. In step four, the risk-standardized readmission rate (RSRR) is derived from the volume-weighted results of five different statistical models, one for each of the following clinically-defined patient cohorts: surgery/gynecology, general medicine, cardiorespiratory, cardiovascular, and neurology. These risk-standardized readmission rates account for differences between hospitals in patient case mix, hospital service mix, as well as patient-level and community-level social risk factors.

The technical appendix has further details on the readmissions methodology, including the categories of discharges that are excluded from the readmissions analyses.

1 Count of eligible discharges*

3 Observed Readmission Rate = $\dfrac{\text{# of eligible readmissions}}{\text{# of eligible discharges}}$ *100

2 Count # of eligible readmissions** within 30 days

4 Enhanced Risk-Standardized Readmission Rate =

Observed rate adjusted for:

- Patient age
- Patient comorbidities
- Discharge condition
- Patient race
- Patient gender
- Patient dual-eligibility status
- Patient homelessness status
- Median family income^
- Median home value^

- Percent of civilian labor force aged 16+ that is unemployed^
- Percent of single parents in family households with people less than 18 years old^
- Percent of population aged 25+ with at least a high school education^
- Percent of white-collar workers of all civilian workers aged 16+^
- Percent of households with cash public assistance or SNAP^
- Percent of population living in same house as one year ago^

*Eligible discharges are discharges for adults during the study period from non-federal acute-care hospitals in Massachusetts. Analyses exclude obstetric and primary psychiatric discharges. Eleven futher exclusions are made. See the technical appendix for further details.

**Eligible readmissions are admisisons for any reason that occur within 30 days of an eligible discharge and are not planned.

^Sourced from the Census and American Community Survey.

Notes

1 Information on the Massachusetts Hospital Inpatient Discharge Database is available at http://www.chiamass.gov/case-mix-data/. The FY2021 Hospital Inpatient Discharge Database processed by CHIA in April 2022 was used for all analyses published in this year's annual statewide report. CHIA's readmission measure is based on inpatient data only. Observation stay data, which is reported by acute care hospitals to CHIA in a separate data file, was not included in the readmission measure.

2 Accounting for Social Risk Factors in Public Reporting on Unplanned Hospital Readmissions in Massachusetts: A Workgroup Report. CHIA (February 2020). https://www.chiamass.gov/assets/docs/r/pubs/2020/Social-Risk-Factors-and-Readmissions-report-February-2020.pdf.

3 Overall star rating for hospitals, https://www.medicare.gov/care-compare/resources/hospital/overall-star-rating.

4 The Hospital Value-Based Purchasing (VBP) Program, https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/HVBP/Hospital-Value-Based-Purchasing.

5 Medicare Fines for High Hospital Readmissions Drop, but Nearly 2,300 Facilities Are Still Penalized, https://khn.org/news/article/medicare-fines-hospital-readmissions-drop-covid/.

6 See note 2

7 See note 2.

8 See note 1.

9 For the updated 2022 v. 11.0 specification see: Yale New Haven Health Services Corporation/Center for Outcomes Research & Evaluation (YNHHSC/CORE). (2022). 2022 Hospital-Wide Readmission Measure Updates and Specifications Report – Version 11.0. YNHHSC/CORE, available at http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Measure-Methodology.html.