

**Massachusetts
Acute Care
Hospital Inpatient
Discharge Data**

FFY 2016-2021

December 2022



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Executive Summary

This report on CHIA's Hospital Inpatient Discharge Database (HIDD) is part of a reporting series providing analyses and trends from the Massachusetts Acute Hospital Case Mix Database. This report updates the previous inpatient report and covers a six-year period, from Federal Fiscal Year (FFY) 2016 to 2021; except where specified, years in this report refer to FFY. In addition to presenting key measures of inpatient utilization overall and by hospital, patient, and discharge characteristics, this report includes sections on behavioral health and coronavirus disease 2019 (COVID-19). The COVID-19 pandemic has greatly disrupted the health care system and affected acute care hospital utilization in historically unprecedented ways during this period.

- From 2016 to 2019, overall inpatient discharge volume remained relatively stable, at around 800,000 inpatient discharges. Inpatient discharges declined 7.5% to 741,074 in 2020, and remained at a similar level in 2021.

- Average length of stay increased from 4.8 to 5.3 days between 2016 and 2021.
- Over this six-year period, a growing share of hospitalizations were for older adults, with over 40% in 2021 for those aged 65 and older.
- In 2021, over 40% of all hospitalizations had an expected primary payer type of Medicare, followed by commercial at slightly over 30%, and Medicaid at around 20%.

Intensive Care Utilization

- Between 2016 and 2021, the share of hospitalizations with associated intensive care use remained stable, at approximately one in six inpatient discharges.
- Average length of stay and total patient days of care for hospitalizations with intensive care use increased by 19.7% and 9.9%, respectively, over the six-year period.

Type and Severity of Hospitalization

- In 2021, more than two-thirds (69.6%) of hospitalizations were categorized as either surgical or medical. Another 19.0% were classified as maternal or neonatal hospitalizations, 6.8% were for behavioral health conditions, and 4.6% were injuries.
- Between 2016 and 2021, the share of discharges classified at the highest levels (Major or Extreme) of severity of illness (SOI) increased from 31.7% to 41.9%.
- In 2021, the average length of stay for those with “Extreme” SOI was 12.1 days, followed by “Major” SOI at 5.9 days, “Moderate” SOI at 4.2 days and “Minor” SOI at 2.8 days.
- In 2021, aside from All Patient Refined–Diagnosis Related Groups (APR-DRGs) related to childbirth and neonatal care, other common APR-DRGs include septicemia, major respiratory infections and inflammations (including most discharges associated with COVID-19), and heart failure.

COVID-19

- Hospitalizations associated with any diagnosis of confirmed or suspected COVID-19 follow the overall trends of positive cases of the virus in Massachusetts, with an initial peak in hospitalizations in April 2020 and a second peak in January 2021.
- Hospitalizations associated with COVID-19 were more common among patients who were aged 65 years or older, Hispanic, or non-white.
- COVID-19 hospitalizations were associated with higher in-hospital mortality, including 19% of all hospitalizations associated with COVID-19 in April 2020.

Behavioral Health

- The prevalence of behavioral health conditions among inpatient discharges increased steadily over the 6-year period from 38.0% in 2016 to 42.5% in 2021.
- In 2021, over one in three (36.1%) hospitalizations were associated with a mental health condition and one in six (16.0%) with a substance use disorder. This includes 9.7% with co-occurring mental health and substance use conditions.
- Over half of discharges with an expected primary payer type of Medicaid were associated with a behavioral health condition (53.0% in 2021). ■

Background

Inpatient services in acute care hospitals serve a vital role in the continuum of health care services in Massachusetts. To better understand trends in inpatient utilization, the Massachusetts Center for Health Information and Analysis (CHIA) has analyzed inpatient discharges in all acute care hospitals in Massachusetts over a six-year period, from FFY 2016 to FFY 2021. This report presents key measures of inpatient utilization overall and by hospital, patient, and discharge characteristics. It is accompanied by a [databook](#) with more detailed analyses and a [technical appendix](#).

The source of this report is CHIA's Hospital Inpatient Discharge Database (HIDD), which contains discharge-level inpatient data provided by acute care hospitals in Massachusetts on patient characteristics, admission and discharge status, diagnoses, treatments, services,

charges, and length of stay. Government agencies, health care providers, payers, and researchers use CHIA's HIDD for various purposes, including public health initiatives, analyses of preventable hospitalizations and readmissions, and comparative cost and outcomes research.

This report on CHIA's HIDD is an update to the inaugural Massachusetts Acute Care Hospital Inpatient Discharge Data Report, published December 2020 using data from FFY 2016 to FFY 2019. Data from this report provide a look at overall trends in inpatient utilization and address the impact of the COVID-19 pandemic on inpatient utilization at acute care hospitals in the Commonwealth. New sections on COVID-19 and behavioral health were added to this report.

In addition to this report, CHIA has developed parallel reports for its other Case Mix databases, the

[Emergency Department Database \(EDD\)](#) and the [Outpatient Observation Database \(OOD\)](#). Additionally, CHIA produces [quarterly updates](#) using preliminary data from the HIDD that provide analyses on a monthly and quarterly basis. These reporting series provide timely access to key analyses from CHIA's Case Mix Databases as they are submitted and processed by the agency.

Discharges included for this report consist of those with a discharge date between October 1, 2015 and September

30, 2021. To find more information on requirements, data intake, internal processing, and data release, please see the Case Mix Data documentation provided on CHIA's [website](#). For further information about the Massachusetts Acute Hospital Case Mix Database (Case Mix) data, including information about data governance, data submissions, data enhancements, and use cases, please see the [Overview of the Massachusetts Acute Hospital Case Mix Database \(December 2019\)](#). ■

SECTION 1:

Introduction to Massachusetts Acute Care Hospitals

Section 8 of Chapter 12C of the Massachusetts General Laws grants CHIA authority to collect data from Massachusetts hospitals. CHIA, and its predecessor agency the Division of Health Care Finance and Policy, have collected data from Massachusetts acute care hospitals for more than twenty years, including inpatient, emergency department, and outpatient observation data. The HIDD contains discharge-level inpatient data on patient characteristics, admission and discharge status, diagnoses, treatments, services, charges, and length of stay.

Acute care hospitals in this report are classified using characteristics that include hospital cohort, high public payer (HPP) status, and multi-system affiliation.

- Most acute care hospitals (41 of 60) in Massachusetts are classified as community hospitals. Additionally, six hospitals are classified as AMCs, seven are classified as teaching hospitals, and six are classified as specialty hospitals.
- Over half (37 of 60) of Massachusetts acute care hospitals are classified as high public payer (HPP), meaning that those hospitals received more than 63 percent of its Gross Patient Service Revenue from government payers. These include Medicare, Medicaid, and other government payers such as the Massachusetts Health Safety Net. Of the 41 community hospitals, 29 hospitals are designated as HPP hospitals.
- Most acute care hospitals (46 of 60) in Massachusetts are affiliated with a multi-acute hospital system, consisting of two or more hospitals. (Note that hospitals may have multiple campuses but still be classified as individual hospitals.) There are 11 multi-hospital systems in Massachusetts.

Characteristics of Massachusetts Hospitals, 2021

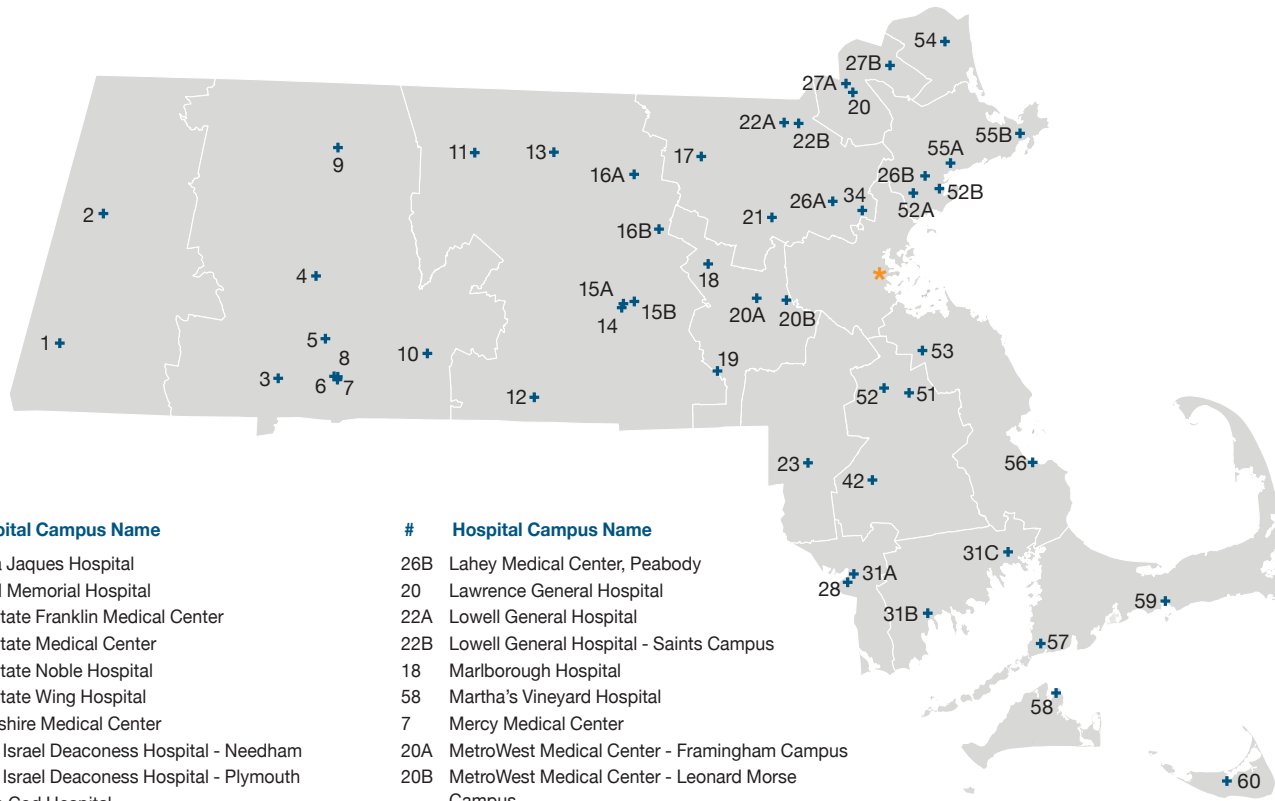
Hospital Characteristic	Number of Hospitals
All Acute Care Hospitals	60
Cohort	
Academic Medical Center	6
Community Hospital	12
Community Hospital-High Public Payer	29
Teaching Hospital	7
Specialty Hospital	6
High Public Payer	
Yes	37
No	23
Tax Status	
Non-Profit/Municipal	51
For-Profit	9
System Affiliation	
Not Affiliated	14
Affiliated	46

Hospital Characteristic	Number of Hospitals
Hospital System	
Baystate Health	4
Berkshire Health Systems	2
Beth Israel Lahey Health	10
Cape Cod Healthcare	2
Heywood Healthcare	2
Mass General Brigham	9
Shriners Hospital for Children	2
Steward Health Care	7
Tenet Healthcare	2
UMass Memorial Health Care	3
Wellforce	3

Note: Wellforce was renamed Tufts Medicine in FFY 2022. Hospitals may comprise one or more campuses; reporting for this table is at the hospital level. For a list of hospitals and campuses included in this report, please see the [databook](#).

Data source: CHIA Hospital Profiles, 2020

Massachusetts Hospitals and Their Campuses, 2021



* Please see page 11 for detailed view of hospital campuses in Metro Boston.

Hospital Campus Name

- 54 Anna Jaques Hospital
- 11 Athol Memorial Hospital
- 9 Baystate Franklin Medical Center
- 6 Baystate Medical Center
- 3 Baystate Noble Hospital
- 10 Baystate Wing Hospital
- 2 Berkshire Medical Center
- 25 Beth Israel Deaconess Hospital - Needham
- 56 Beth Israel Deaconess Hospital - Plymouth
- 59 Cape Cod Hospital
- 4 Cooley Dickinson Hospital
- 21 Emerson Hospital
- 1 Fairview Hospital
- 57 Falmouth Hospital
- 12 Harrington Memorial Hospital
- 16A HealthAlliance Hospital - Leominster Campus
- 16B HealthAlliance - Clinton Hospital
- 13 Heywood Hospital
- 5 Holyoke Medical Center
- 55B Lahey Health - Addison Gilbert Hospital
- 55A Lahey Health - Beverly Hospital
- 26A Lahey Hospital & Medical Center

Hospital Campus Name

- 26B Lahey Medical Center, Peabody
- 20 Lawrence General Hospital
- 22A Lowell General Hospital
- 22B Lowell General Hospital - Saints Campus
- 18 Marlborough Hospital
- 58 Martha's Vineyard Hospital
- 7 Mercy Medical Center
- 20A MetroWest Medical Center - Framingham Campus
- 20B MetroWest Medical Center - Leonard Morse Campus
- 19 Milford Regional Medical Center
- 42 Morton Hospital
- 60 Nantucket Cottage Hospital
- 17 Nashoba Valley Medical Center
- 52B North Shore Medical Center - Salem Campus
- 52A North Shore Medical Center - Union Campus
- 14 Saint Vincent Hospital
- 8 Shriners Hospitals for Children Springfield
- 51 Signature Healthcare Brockton Hospital
- 53 South Shore Hospital
- 31A Southcoast Hospitals Group - Charlton Memorial Campus
- 31B Southcoast Hospitals Group - St. Luke's Campus

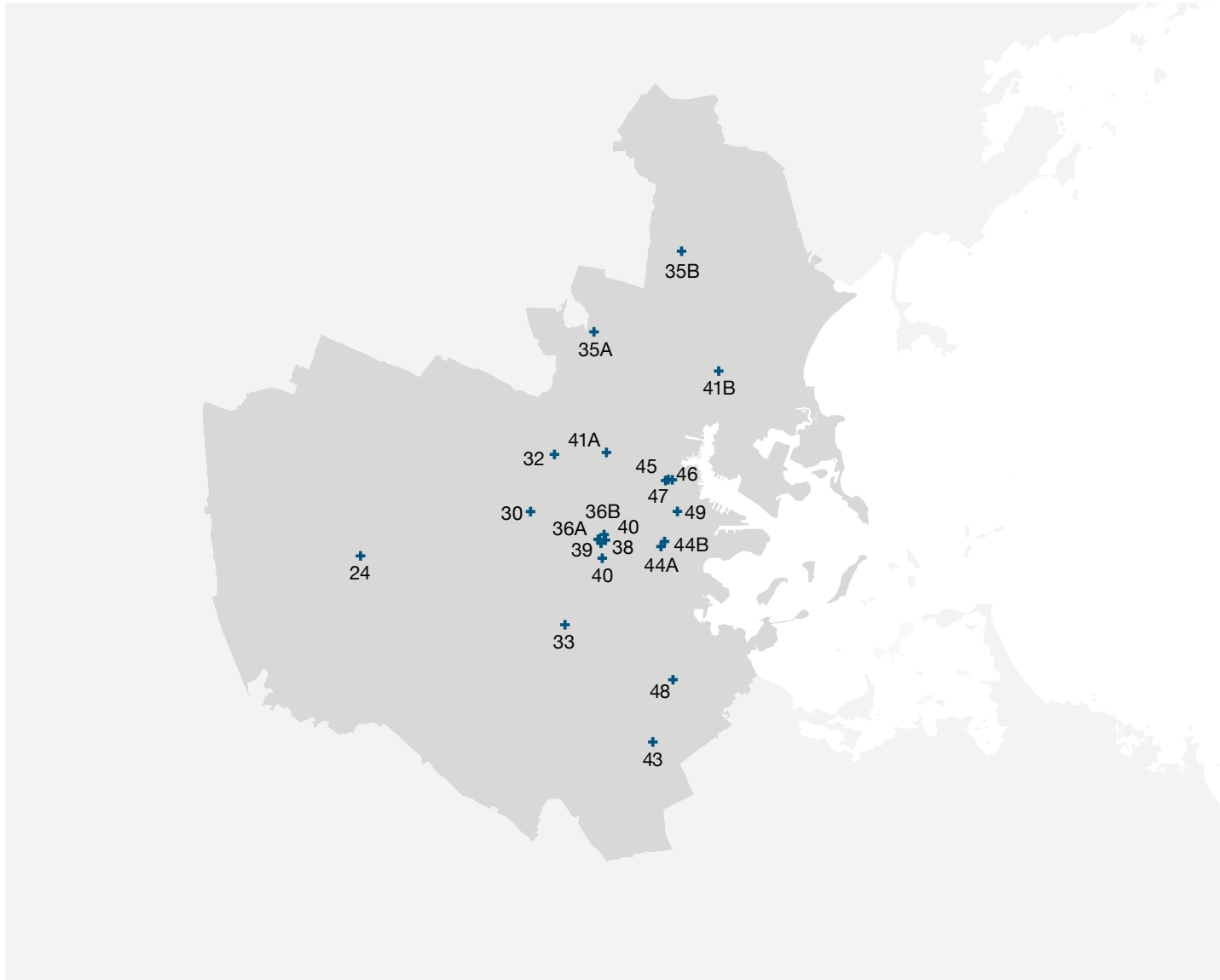
Hospital Campus Name

- 31C Southcoast Hospitals Group - Tobey Hospital Campus
- 50 Steward Good Samaritan Medical Center
- 27B Steward Holy Family Hospital - Haverhill
- 27A Steward Holy Family Hospital - Methuen
- 28 Steward Saint Anne's Hospital
- 23 Sturdy Memorial Hospital
- 15A UMass Memorial Campus
- 15B UMass Memorial Medical Center - University Campus
- 34 Winchester Hospital

Note: Hospitals may comprise one or more campuses; reporting on this page is at the hospital campus level. For a list of all hospitals and campuses included in this report, please see the [databook](#).

Data source: CHIA Hospital Profiles, 2020 and MassGIS¹

Metro Boston Hospitals and Their Campuses, 2021



#	Hospital Campus Name
43	Beth Israel Deaconess Hospital - Milton
36B	Beth Israel Deaconess Medical Center - East Campus
36A	Beth Israel Deaconess Medical Center - West Campus
40	Boston Children's Hospital
44A	Boston Medical Center - Menino Pavilion Campus
44B	Boston Medical Center - Newton Pavilion Campus
33	Brigham and Women's Faulkner Hospital
38	Brigham and Women's Hospital
41A	Cambridge Health Alliance - Cambridge Hospital Campus
41B	Cambridge Health Alliance - Everett Hospital Campus
37	Dana-Farber Cancer Institute
35A	Lawrence Memorial Hospital Campus - MelroseWakefield Healthcare
45	Massachusetts Eye and Ear Infirmary
46	Massachusetts General Hospital
35B	MelroseWakefield Hospital Campus - MelroseWakefield Healthcare
32	Mount Auburn Hospital
39	New England Baptist Hospital
24	Newton-Wellesley Hospital
47	Shriners Hospitals for Children Boston
48	Steward Carney Hospital
30	Steward St. Elizabeth's Medical Center
49	Tufts Medical Center

Hospitals may comprise one or more campuses; reporting on this page is at the hospital campus level. For a list of all hospitals and campuses included in this report, please see the [databook](#).

Data source: CHIA Hospital Profiles, 2020 and MassGIS'

SECTION 2:

Discharge Characteristics and Utilization

This section provides hospital inpatient utilization patterns overall, by hospital and patient characteristics, expected primary payer type and discharge setting. Unless noted, key findings refer to data year 2021.

Overall Utilization

- Between 2016 and 2019, overall acute care discharge volume remained relatively stable, around 800,000 inpatient discharges. Inpatient discharges declined 7.5%, to 741,074 in 2020, and remained at similar level in 2021.
- Total days of patient care increased between 2016 to 2019, decreased in 2020, and returned to pre-pandemic levels in 2021, at around four million inpatient days.
- Average length of stay increased from 4.8 to 5.3 days between 2016 and 2021.

Hospital Characteristics

- From 2016 to 2021, all hospital cohorts saw an increase in average length of stay, ranging from 5-15%, with the greatest percentage increases in AMCs and teaching hospitals.
- Over half of all inpatient discharges were from community hospitals, with 37.1% of inpatient discharges from community hospitals with a HPP designation, and 14.6% from other community hospitals. Discharges from AMCs (29.1%) and teaching hospitals (16.3%) made up the other significant portion.
- Three in four inpatient discharges were from hospitals with a multi-acute hospital system affiliation. The two largest systems, Mass General Brigham and Beth Israel Lahey Health, represented 39.2% of all inpatient discharges.

Patient Characteristics

- The share of discharges for patients aged 65 and older has grown steadily, from 38.8% to 41.7% of all discharges between 2016 and 2021.
- The number of discharges for female patients exceeded those of male patients by nearly 10%, due in part to admissions for maternity-related conditions.
- Nearly one in four discharges (23.3%) were for non-white and Hispanic populations, consistent with racial and ethnic population trends in the Commonwealth.³

Expected Primary Payer Type

- Over two-fifths of all hospitalizations had Medicare as the expected primary payer type; slightly less than one-third had commercial as their expected primary payer, and around one in five had Medicaid as the expected primary payer.
- Among patients aged 0-17 and 18-44, commercial insurance was most common, followed by Medicaid. Medicare was the most common expected primary payer type among those aged 65 and over.

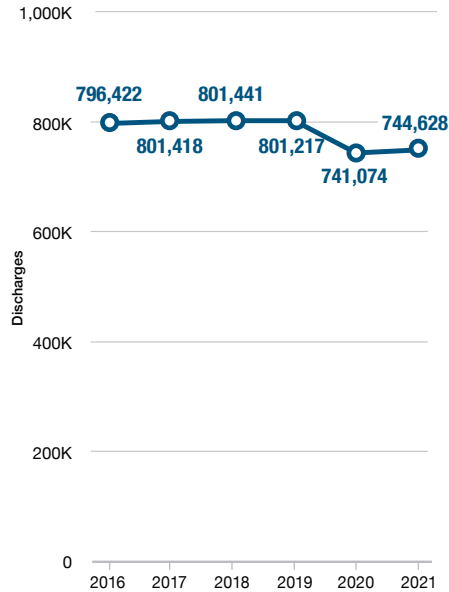
- The Cape and Islands region had the highest share of discharges associated with Medicare as the expected primary payer type (55.6%), whereas Medicaid was most prevalent in the East Merrimack region (34.1%). The region with the highest share of commercial insurance was Norwood/Attleboro (43.4%).

Discharge Setting

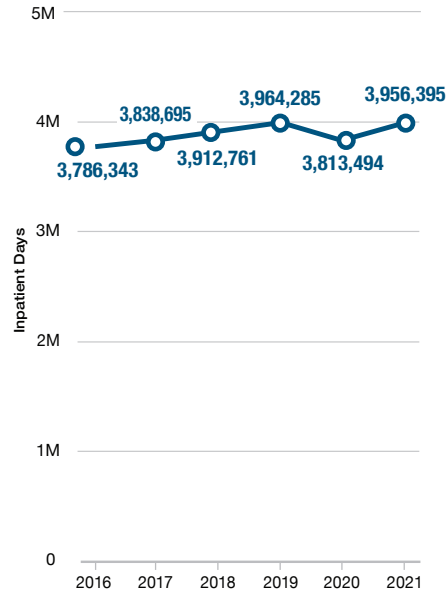
- Over half (55.1%) of inpatient stays resulted in a discharge to home. Over one in five discharges (21.6%) were discharges to home with home health care, and one in ten (9.7%) discharges were to a skilled nursing facility (SNF).
- Discharges to home with a Home Health Agency (HHA) were most common in the Cape and Islands region (28.7%), whereas the Cape and Islands and Berkshires regions had the highest shares of discharges to SNFs (13.2% and 12.5%, respectively).■

Inpatient Utilization Overview, FFY 2016-2021

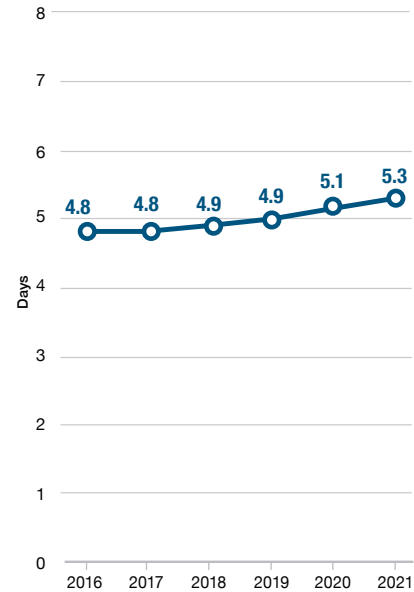
Total Inpatient Discharges, 2016-2019



Total Inpatient Days, 2016-2019



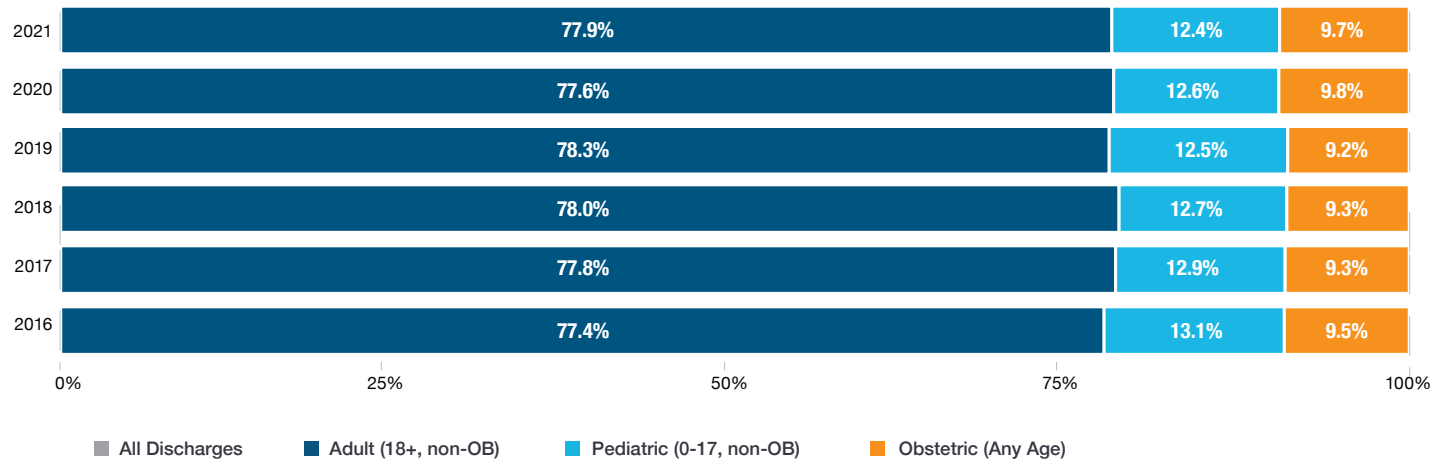
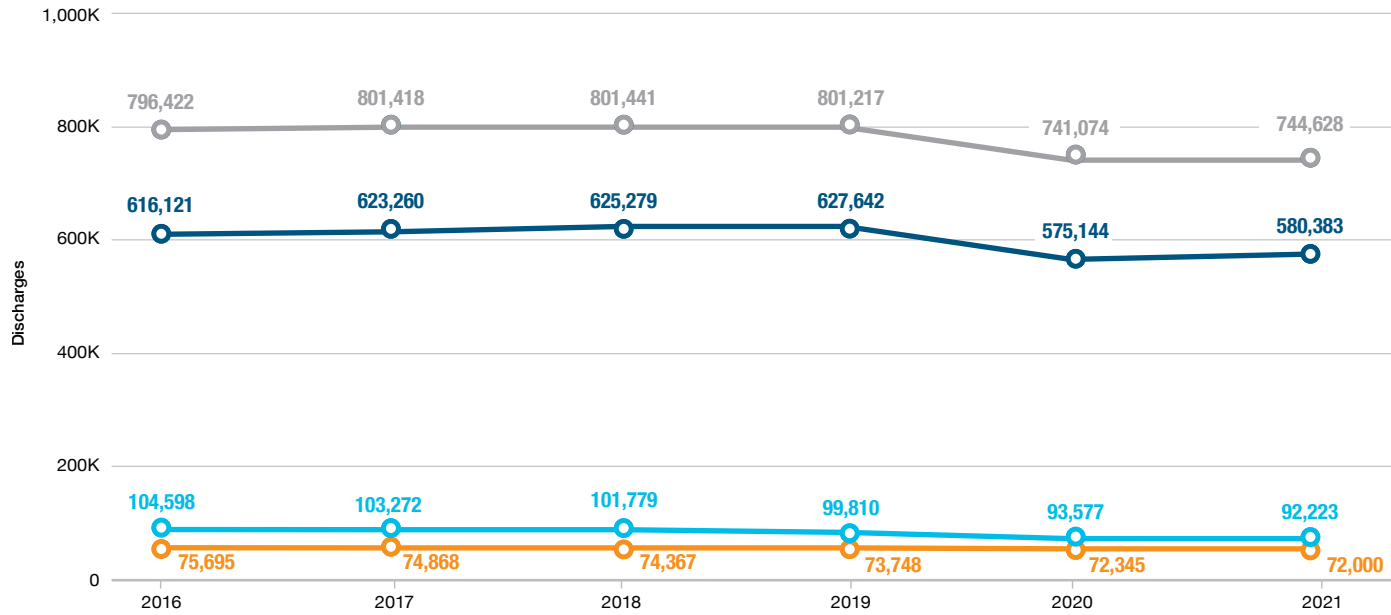
Average Length of Stay, 2016-2019



Note: Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

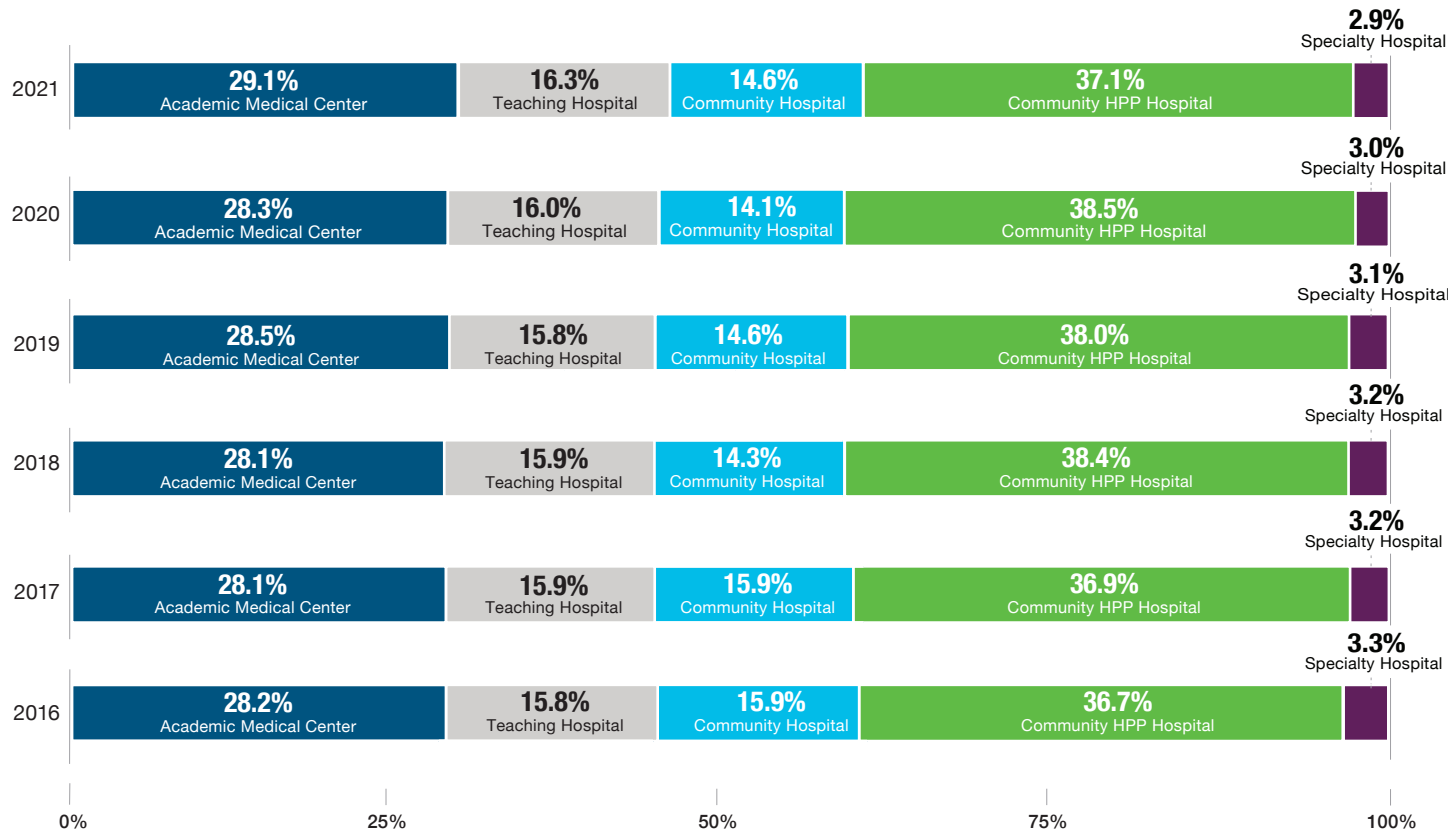
Hospital Inpatient Discharges, FFY 2016-2021



Note: Discharges were grouped into one of three groups: any discharge with an obstetric (OB) primary diagnosis, adult (age 18+) without an OB primary diagnosis and pediatric (age 0-17) without an OB primary diagnosis. Percentages may not sum to 100% due to rounding and because they exclude a small number of discharges with missing data. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

Hospital Inpatient Discharges by Hospital Cohort, FFY 2016-2021

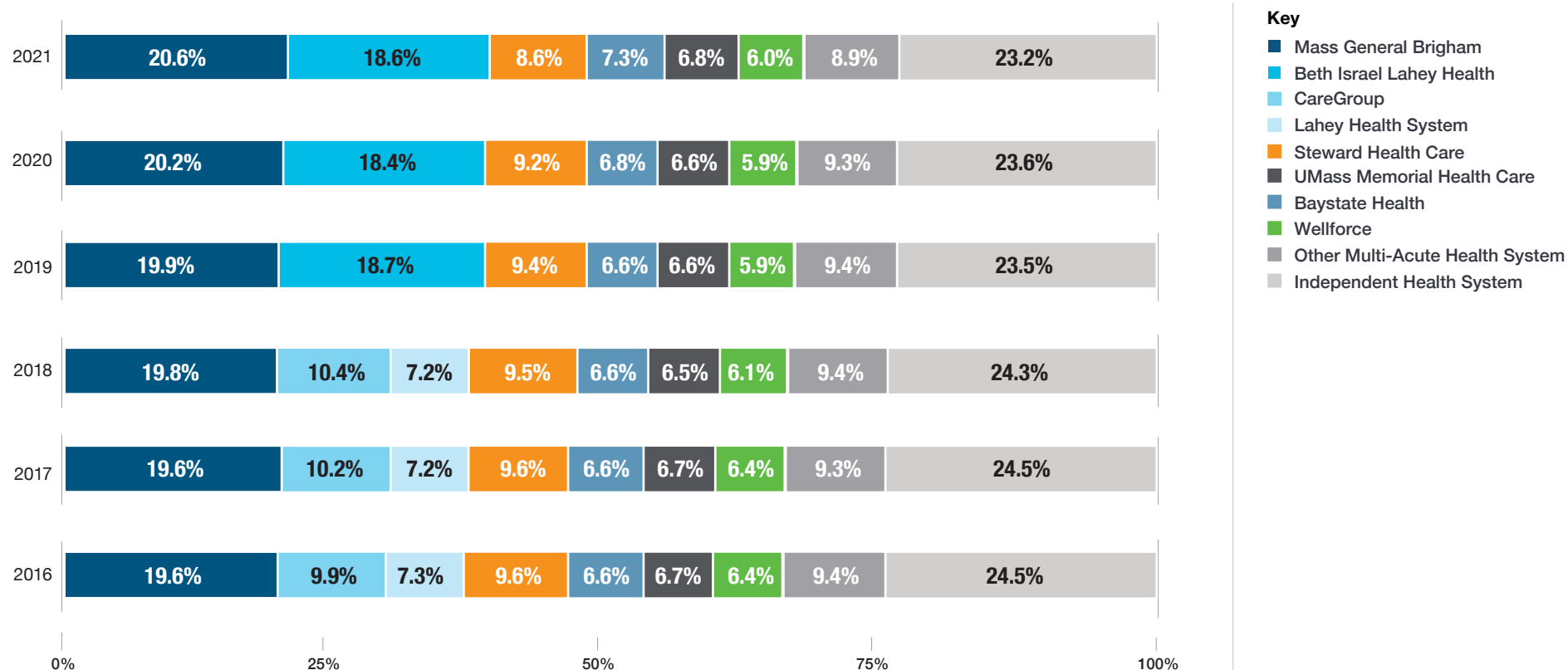


	2016	2017	2018	2019	2020	2021
Academic Medical Center	224,956	225,348	225,350	228,329	210,008	216,600
Teaching Hospital	126,191	127,111	127,767	126,878	118,236	121,107
Community Hospital	126,547	127,632	114,847	116,815	104,741	108,725
Community HPP Hospital	292,568	295,500	307,836	304,620	285,641	276,552
Specialty Hospital	26,160	25,827	25,641	24,575	22,448	21,644
Total	796,422	801,418	810,441	801,217	741,074	744,628

Note: Each acute care hospital is assigned to one of five mutually exclusive hospital groups: Academic Medical Centers (AMCs), teaching hospitals other than AMCs, community-High Public Payer (HPP) hospitals, other community hospitals, and specialty hospitals. Hospital characteristics are assessed at the end of the state fiscal year. Percentages may not sum to 100% due to rounding. Due to incomplete data in FFY 2021, one Community HPP Hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. Additionally, 396 discharges in FFY 2020 and 22 in FFY 2021 associated with field hospitals are not included on this page. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

Hospital Inpatient Discharges by System Affiliation, FFY 2016-2021

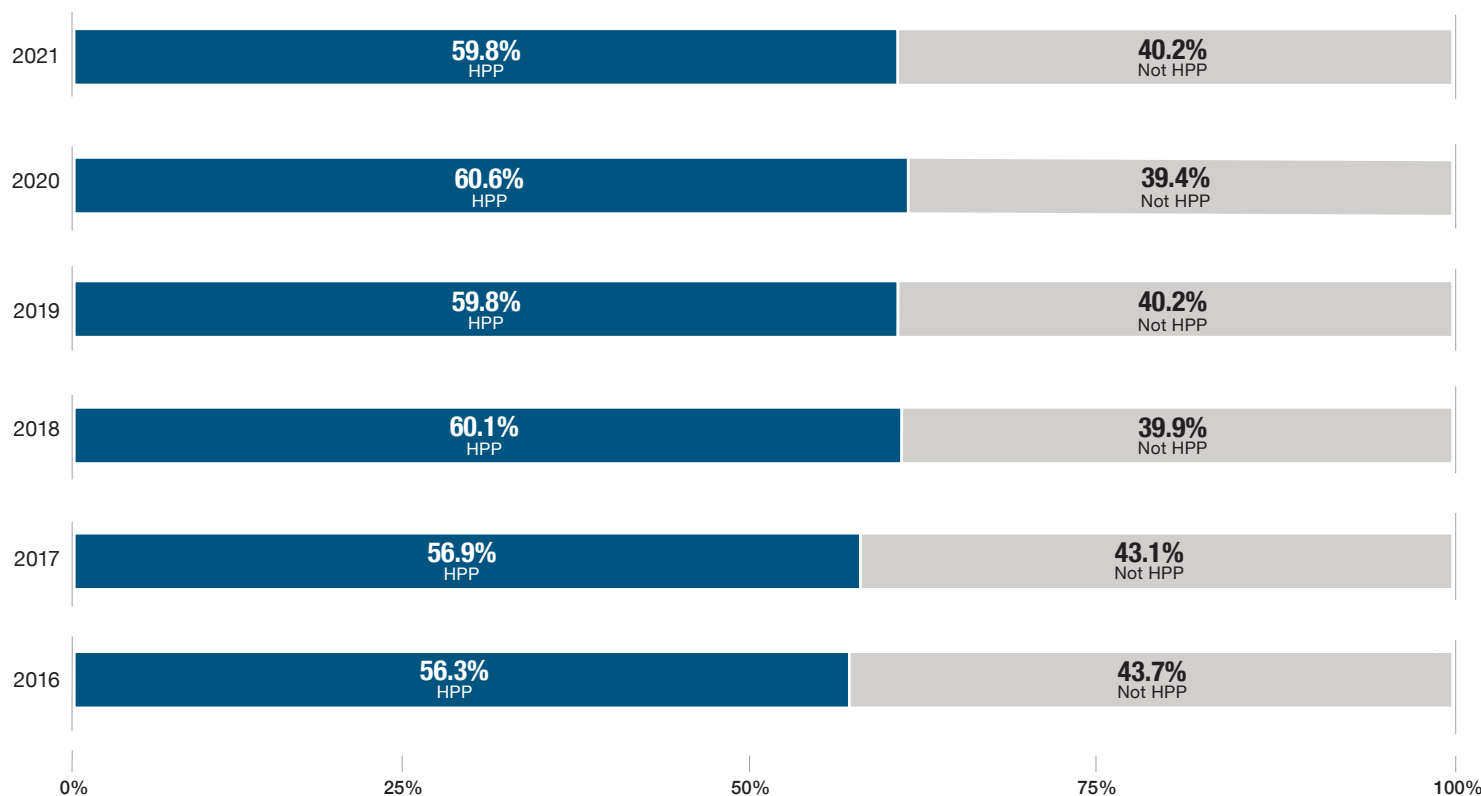


- Key**
- Mass General Brigham
 - Beth Israel Lahey Health
 - CareGroup
 - Lahey Health System
 - Steward Health Care
 - UMass Memorial Health Care
 - Baystate Health
 - Wellforce
 - Other Multi-Acute Health System
 - Independent Health System

Note: Wellforce was renamed Tufts Medicine in FFY 2022. Percentages may not sum to 100% due to rounding. Due to incomplete data in FFY 2021, one Independent Health System Hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. Additionally, there were 396 discharges in FFY 2020 and 22 in FFY 2021 associated with field hospitals that are not included on this page. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

Hospital Inpatient Discharges by High Public Payer Status, FFY 2016-2021

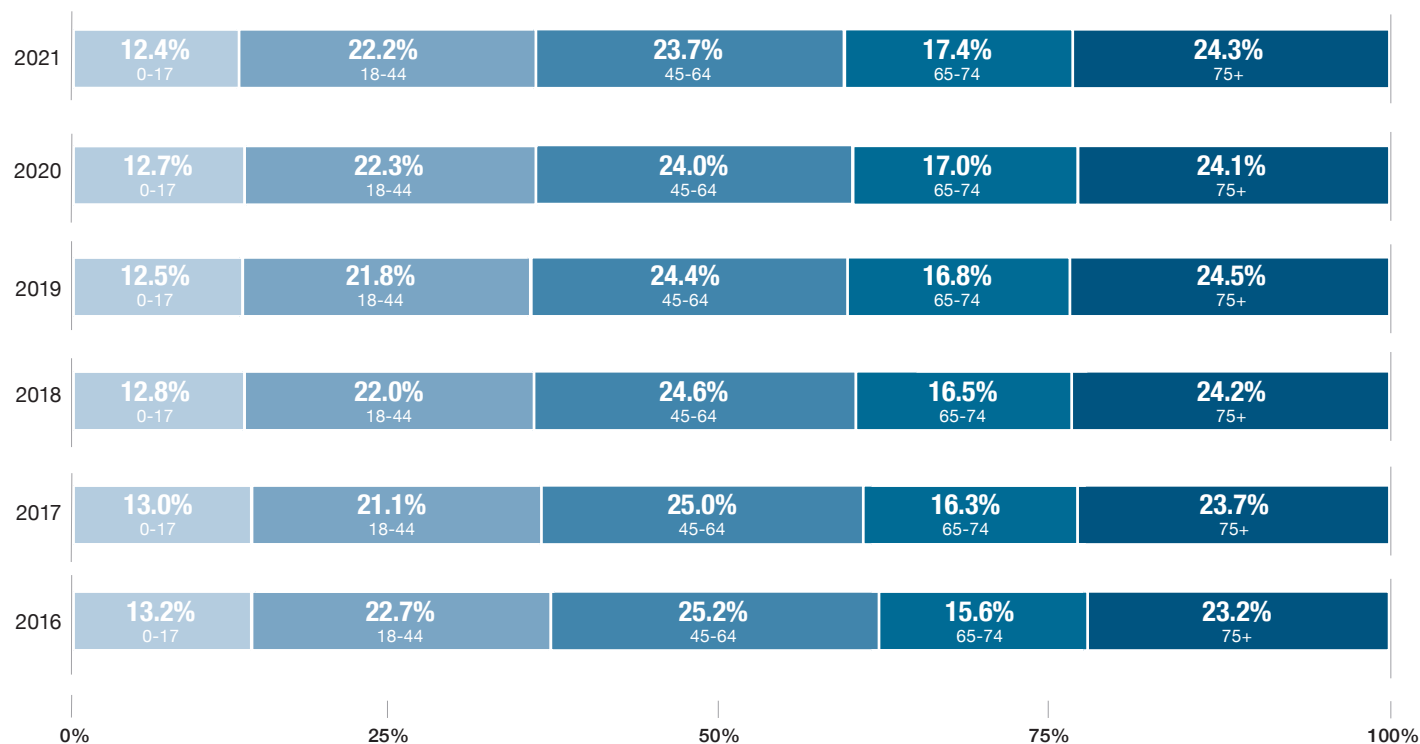


	2016	2017	2018	2019	2020	2021
HPP	448,437	455,726	481,563	497,312	449,138	445,259
Not HPP	347,985	345,692	319,878	321,905	291,540	299,347
Total	796,442	801,418	801,441	801,217	740,687	744,606

Note: The Executive Office of Health and Human Services (EOHHS) categorizes certain acute hospitals as High Public Payer (HPP) hospitals for the purpose of setting MassHealth rates. A hospital qualified for HPP status if it had 63% or more of gross patient service revenue attributed to Medicare, Medicaid, and other government payers, including the Health Safety Net. Percentages may not sum to 100% due to rounding. Due to incomplete data in FFY 2021, one HPP hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. Additionally, there were 396 discharges in FFY 2020 and 22 in FFY 2021 associated with field hospitals that are not included on this page. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

Hospital Inpatient Discharges by Age Group, FFY 2016-2021

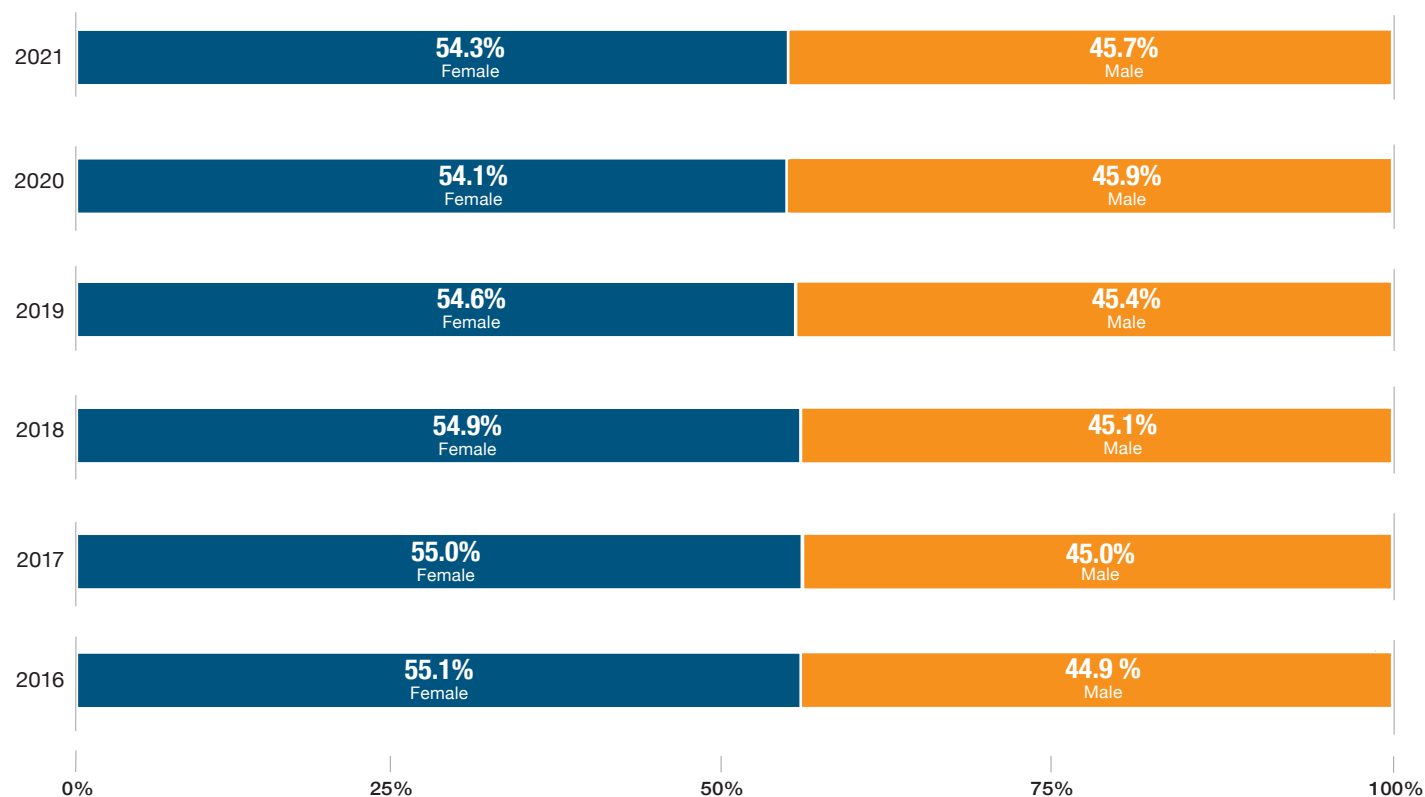


	2016	2017	2018	2019	2020	2021
0-17	105,176	103,794	102,218	100,249	93,973	92,586
18-44	180,852	177,159	176,119	174,689	165,101	165,342
45-64	201,037	200,070	197,046	195,574	177,884	176,210
65-74	124,545	130,275	132,201	134,780	125,770	129,432
75+	184,804	190,102	193,841	195,908	178,338	181,036
Total	796,422	801,418	801,441	801,217	741,074	744,628

Note: Percentages may not sum to 100% due to rounding and because they exclude a small number of discharges with missing data. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

Hospital Inpatient Discharges by Sex, FFY 2016-2021

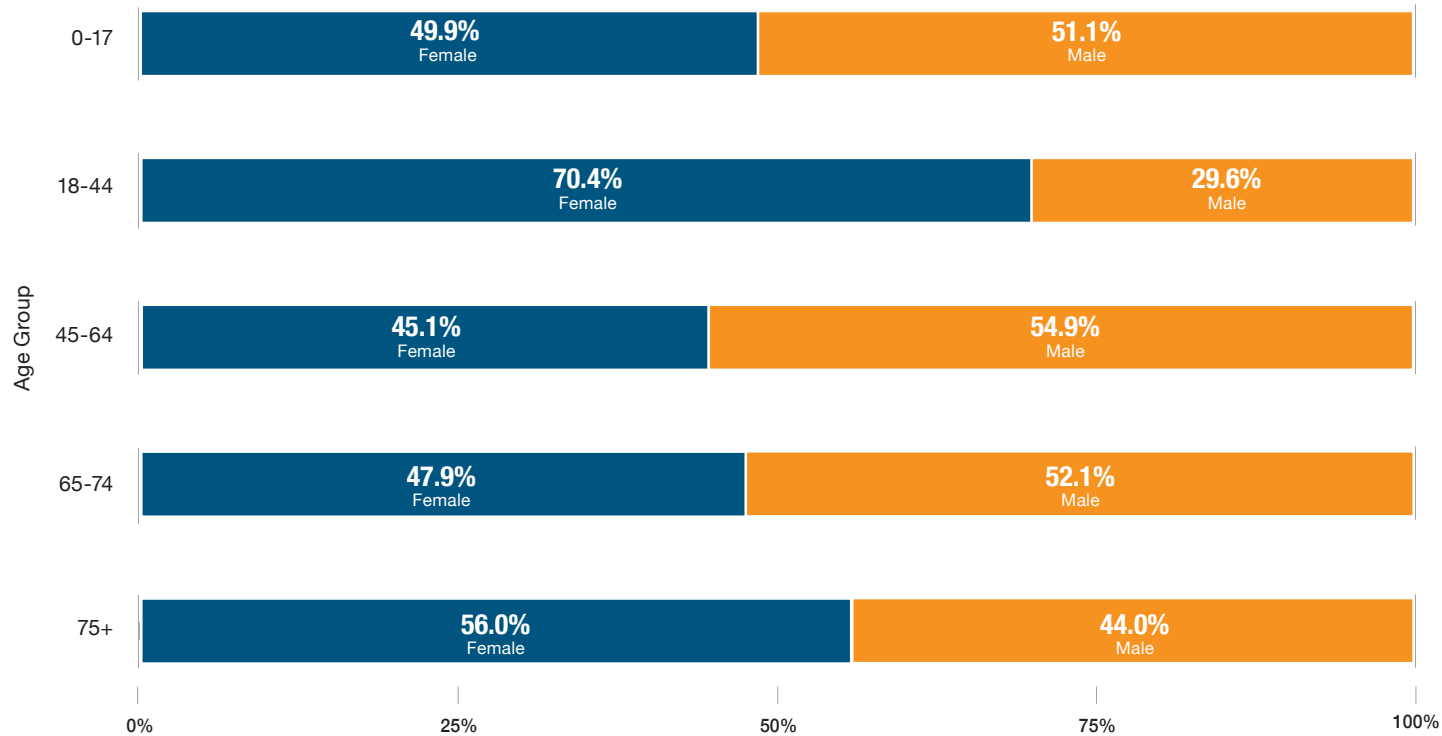


	2016	2017	2018	2019	2020	2021
Female	439,014	441,009	440,064	437,647	400,895	404,842
Male	357,380	360,387	361,358	363,541	340,163	340,119
Total	796,422	801,418	801,441	801,217	741,074	744,628

Note: Percentages may not sum to 100% due to rounding and because they exclude a small number of discharges with missing data. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

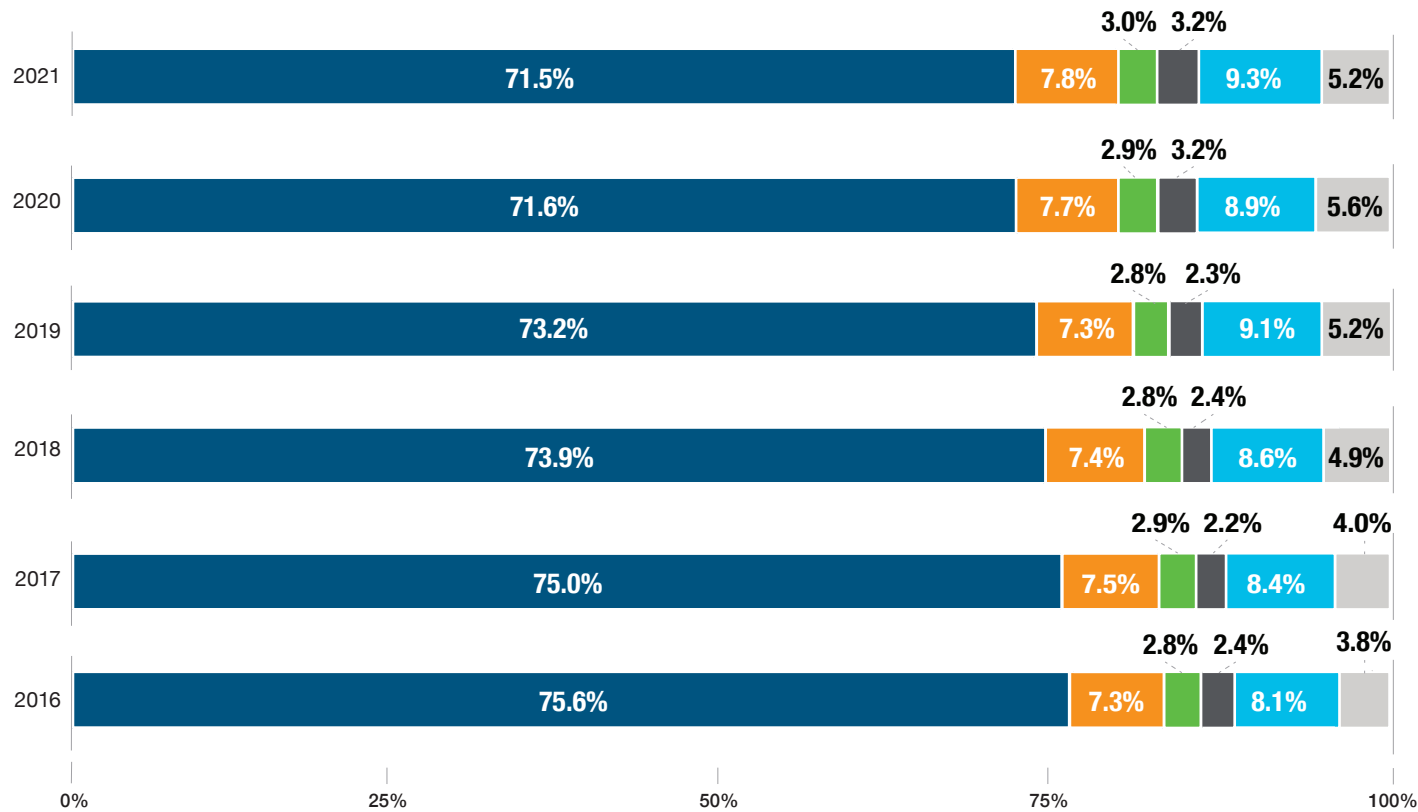
Hospital Inpatient Discharges by Age Group and Sex, FFY 2021



Note: Percentages may not sum to 100% due to rounding and because they exclude a small number of discharges with missing data. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

Hospital Inpatient Discharges by Race/Ethnicity, FFY 2016-2021



Key

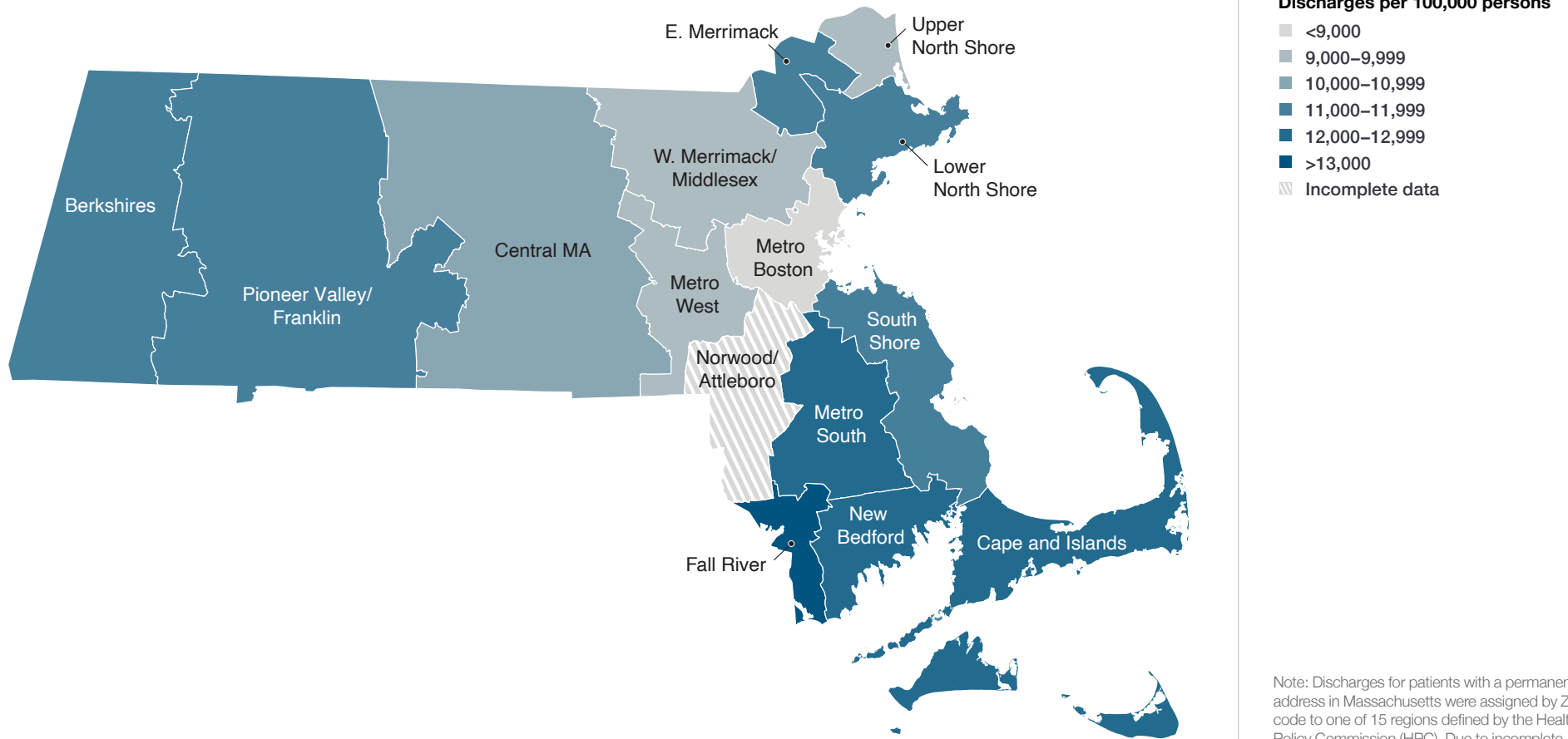
- White, non-Hispanic
- Black, non-Hispanic
- Asian, non-Hispanic
- Other or Multiple Races, non-Hispanic
- Hispanic of Any Race
- Missing

	2016	2017	2018	2019	2020	2021
White, non-Hispanic	602,105	601,892	592,285	586,461	530,967	532,373
Black, non-Hispanic	57,744	59,709	59,605	58,272	57,272	58,192
Asian, non-Hispanic	22,268	23,035	22,221	22,534	21,473	22,102
Other or Multiple Races, non-Hispanic	19,265	17,578	19,549	18,742	23,990	24,027
Hispanic of Any Race	64,764	67,207	68,604	73,152	65,810	68,948
Missing	30,276	31,997	39,177	41,596	41,562	38,986
Total	796,422	801,418	801,441	801,217	741,047	744,628

Note: More detailed race/ethnicity categories are available in the databook accompanying this report. Percentages may not sum to 100% due to rounding. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

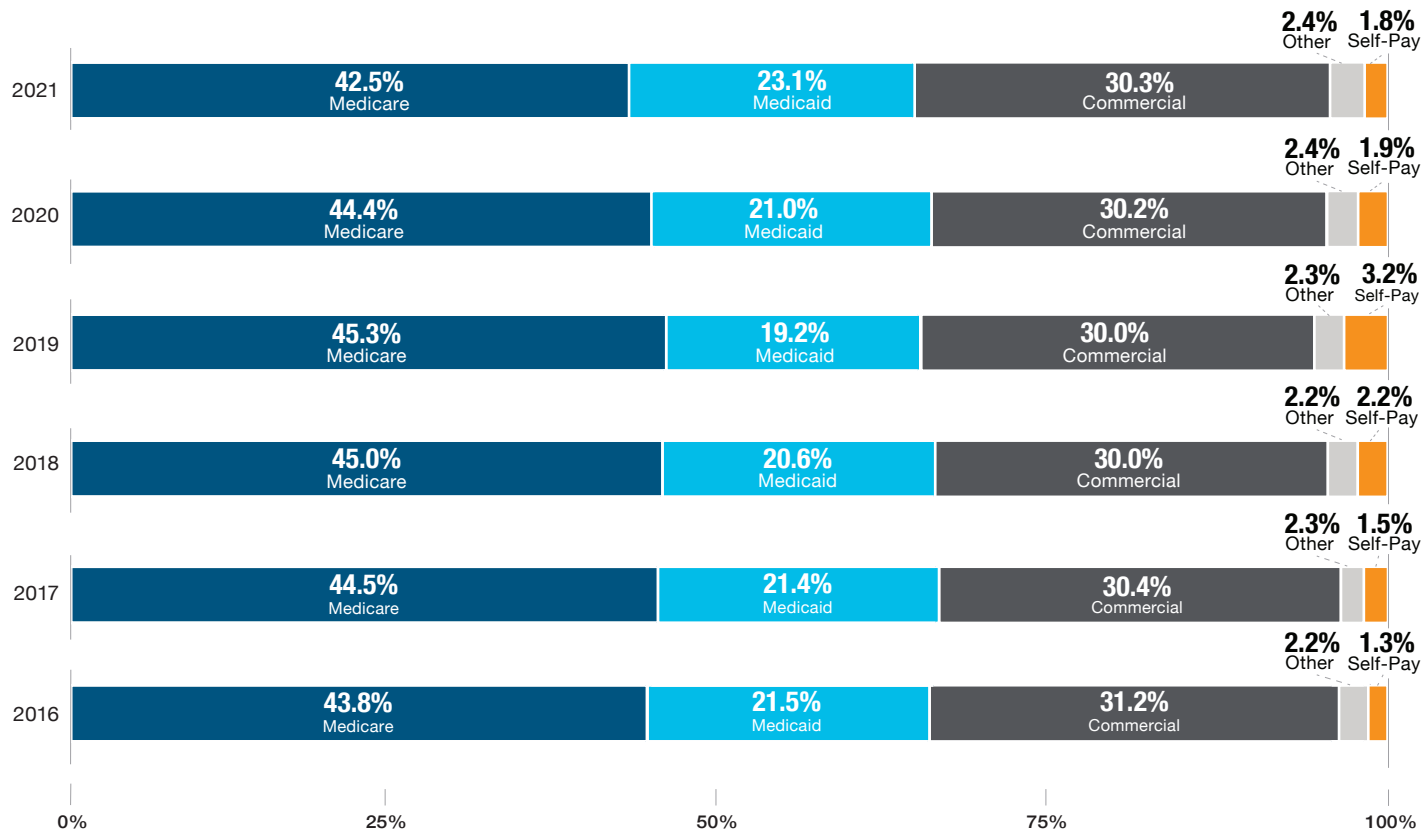
Hospital Inpatient Discharges by Patient Region of Residence, FFY 2021



Note: Discharges for patients with a permanent address in Massachusetts were assigned by ZIP code to one of 15 regions defined by the Health Policy Commission (HPC). Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. As this hospital made up about one in four discharges in the Norwood/Attleboro region, the data for this region have been suppressed. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

Hospital Inpatient Discharges by Expected Primary Payer Type, FFY 2016-2021

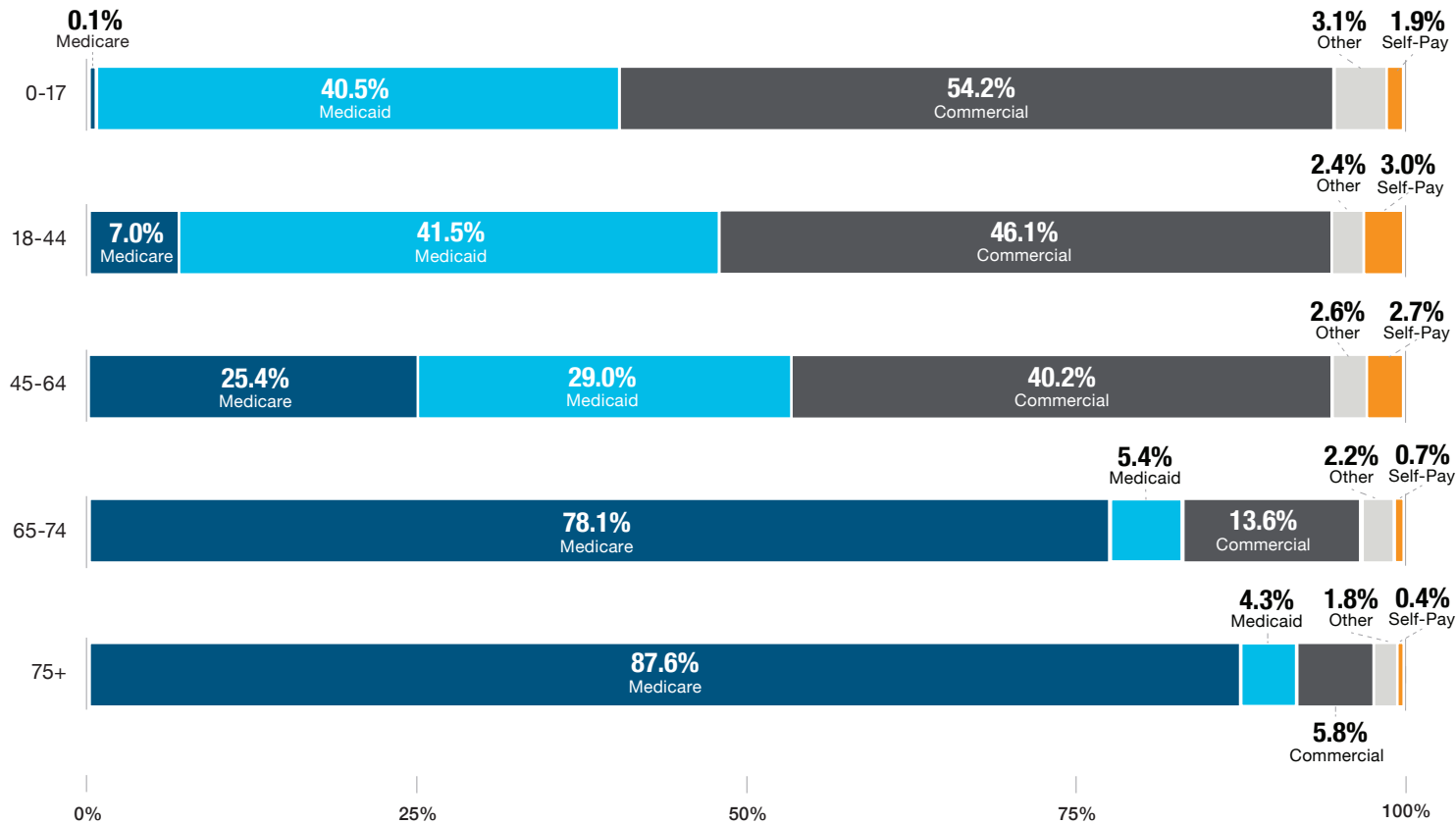


	2016	2017	2018	2019	2020	2021
Commercial	248,875	243,314	240,357	240,447	223,724	225,290
Medicare	348,563	356,965	360,481	362,959	329,387	316,214
Medicaid	170,924	171,297	164,718	153,718	155,547	171,954
Other	17,838	18,129	17,917	18,796	17,765	17,628
Self-Pay	10,191	11,694	17,962	25,272	14,285	13,147
Total	796,422	801,418	801,441	801,217	741,074	744,628

Note: Analysis includes information on expected primary payer type as provided by the hospital and does not include information on secondary or supplemental payer information. Other insurance includes Worker's Compensation, Other Government Payment, Auto Insurance, and Dental Plans. Figures for expected primary payer type may not sum to the total values due to rounding and because they exclude a small number of discharges with missing payer type information. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

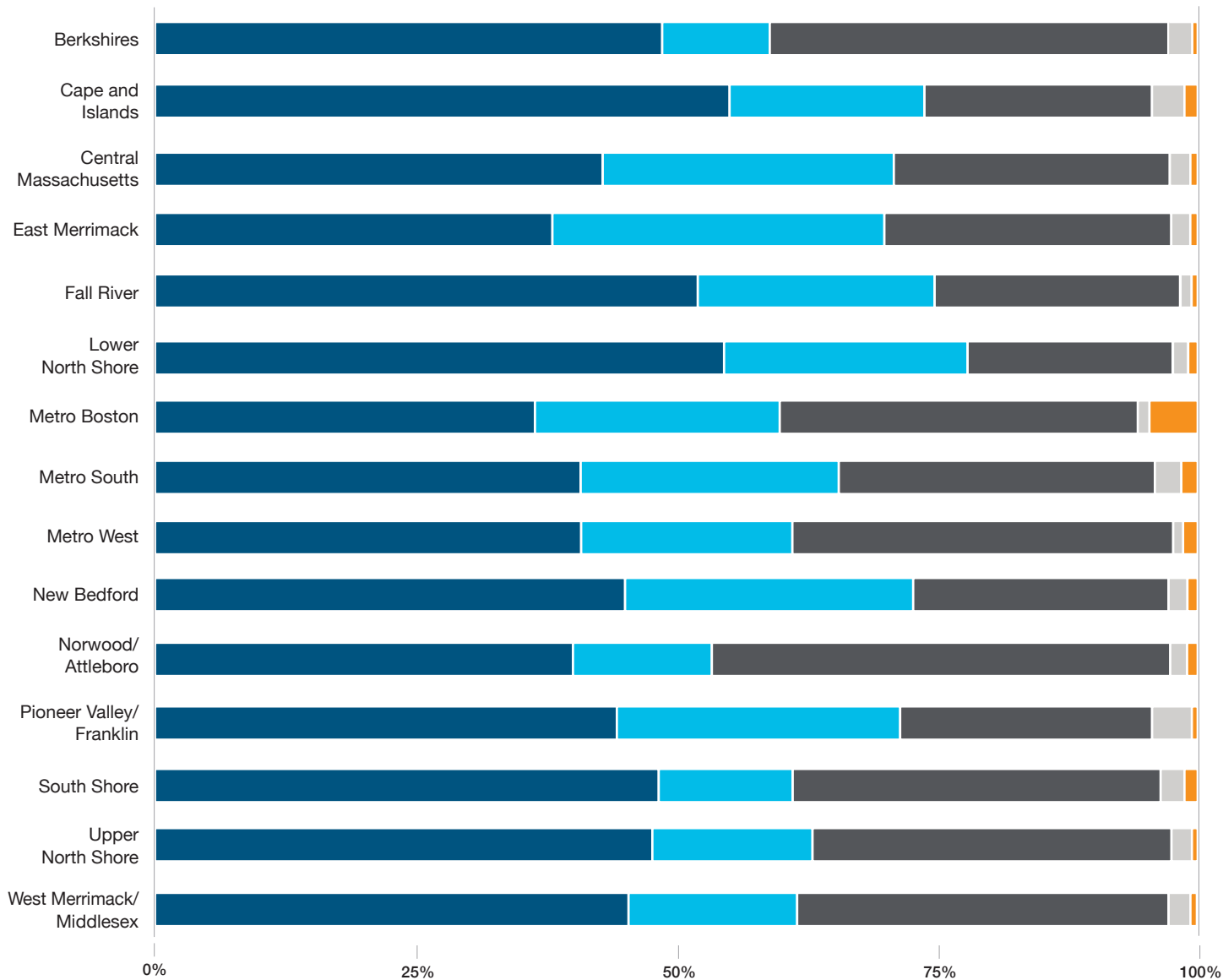
Hospital Inpatient Discharges by Age Group and Payer Type, FFY 2021



Note: Analysis includes information on expected primary payer type as provided by the hospital and does not include information on secondary or supplemental payer information. Other insurance includes Worker's Compensation, Other Government Payment, Auto Insurance, and Dental Plans. Figures for expected primary payer type may not sum to the total values due to rounding and because they exclude a small number of discharges with missing payer type information. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

Hospital Inpatient Discharges by Expected Primary Payer Type and Patient Region of Residence, FFY 2021



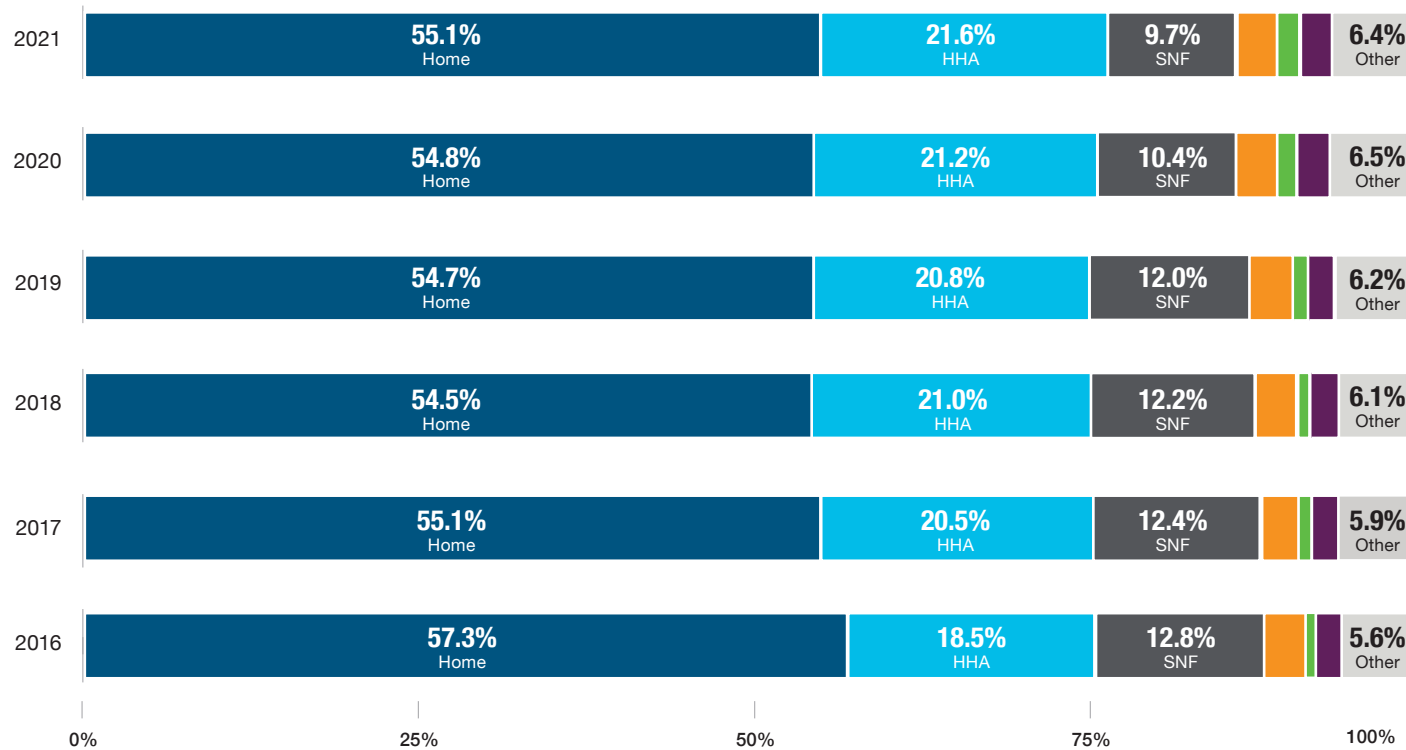
Key

- Medicare
- Medicaid
- Commercial
- Other
- Self-Pay

Note: Discharges for patients with a permanent address in Massachusetts were assigned by ZIP code to one of 15 regions defined by the Health Policy Commission (HPC). Other insurance includes Worker's Compensation, Other Government Payment, Auto Insurance, and Dental Plans. The analysis on this page excludes a small number of discharges with missing payer type information. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

Hospital Inpatient Discharges by Discharge Setting, FFY 2016-2021

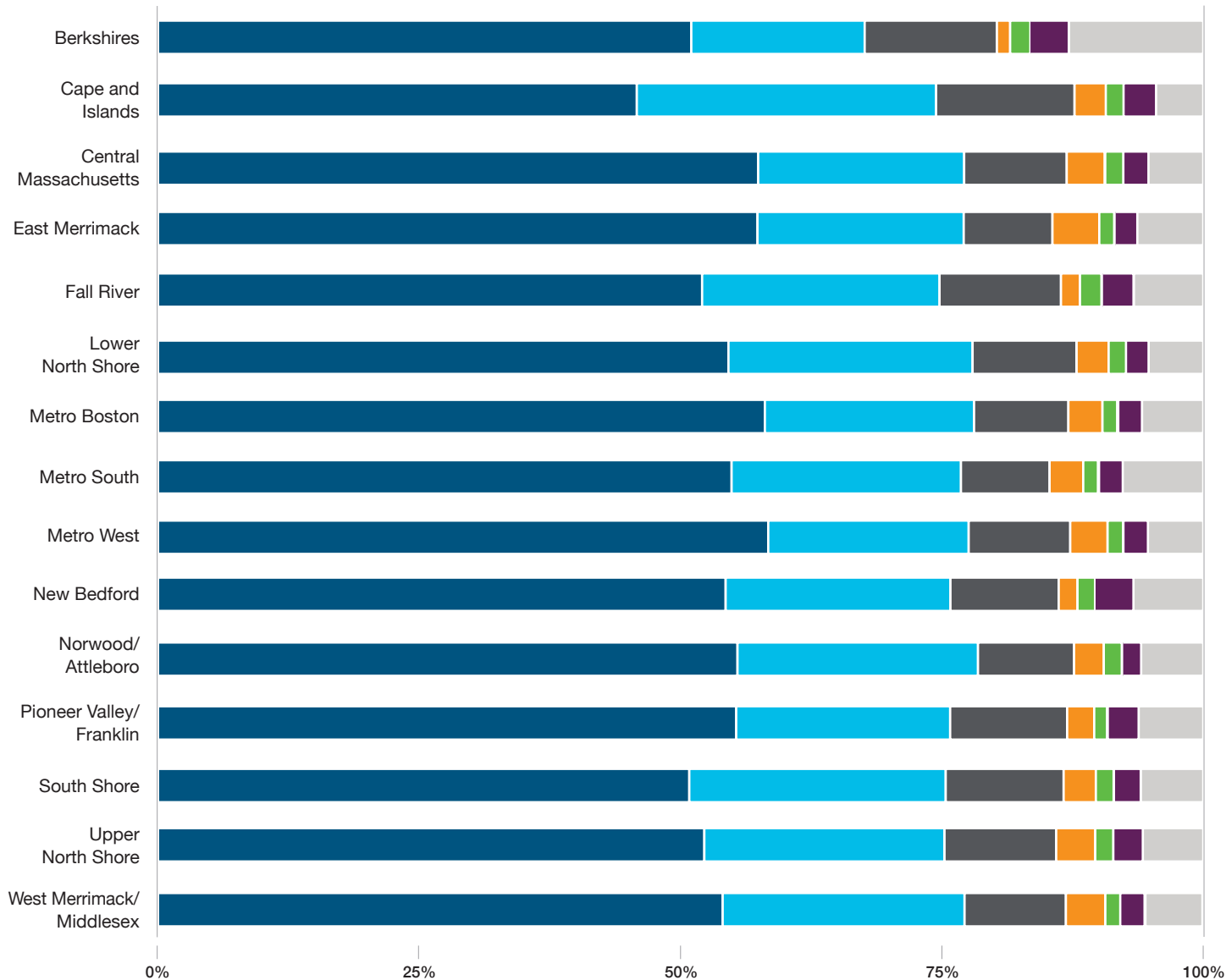


	2016	2017	2018	2019	2020	2021
Home	455,981	441,453	436,711	437,996	405,792	410,239
HHA	147,119	164,547	168,655	166,480	157,048	160,475
SNF	101,606	99,482	97,603	95,924	77,088	72,586
Rehab	24,983	24,817	26,262	25,968	23,812	24,049
Hospice	6,684	7,663	8,323	9,291	10,391	11,070
Expired	15,068	15,787	15,294	16,009	18,642	18,706
Other	44,764	47,647	48,564	49,494	48,285	47,481
Total	796,422	801,418	801,441	801,217	741,074	744,628

Note: Discharge setting was classified into one of five categories: Home, Home with Home Health Agency (HHA), Skilled Nursing Facility (SNF), Rehabilitation (Rehab), Hospice, and Other. Figures for discharge setting may not sum to the total values due to rounding and because they exclude a small number of discharges with missing discharge setting information. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

Hospital Inpatient Discharges by Discharge Setting and Patient Region of Residence, FFY 2021

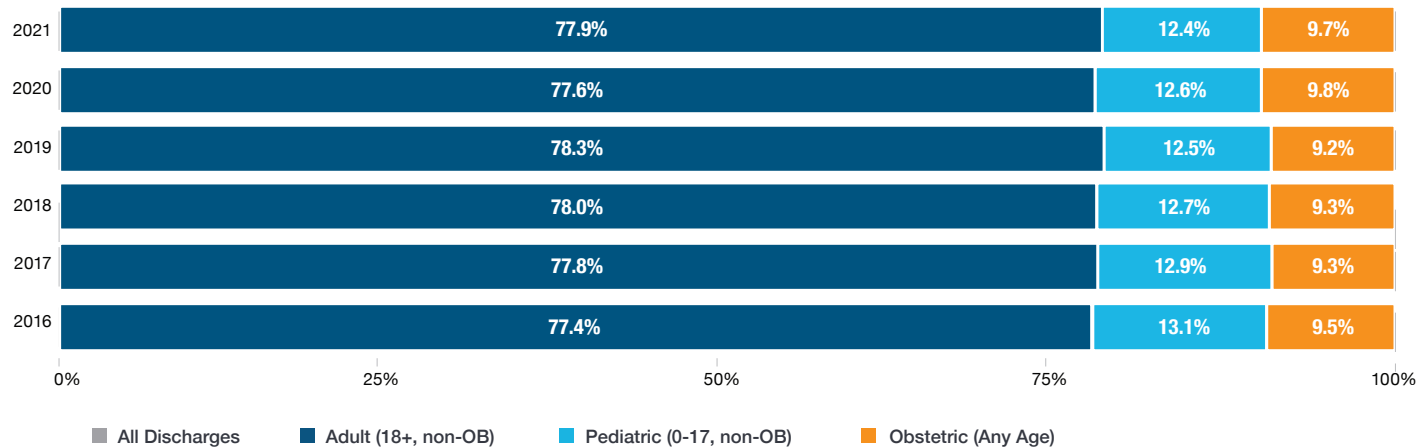
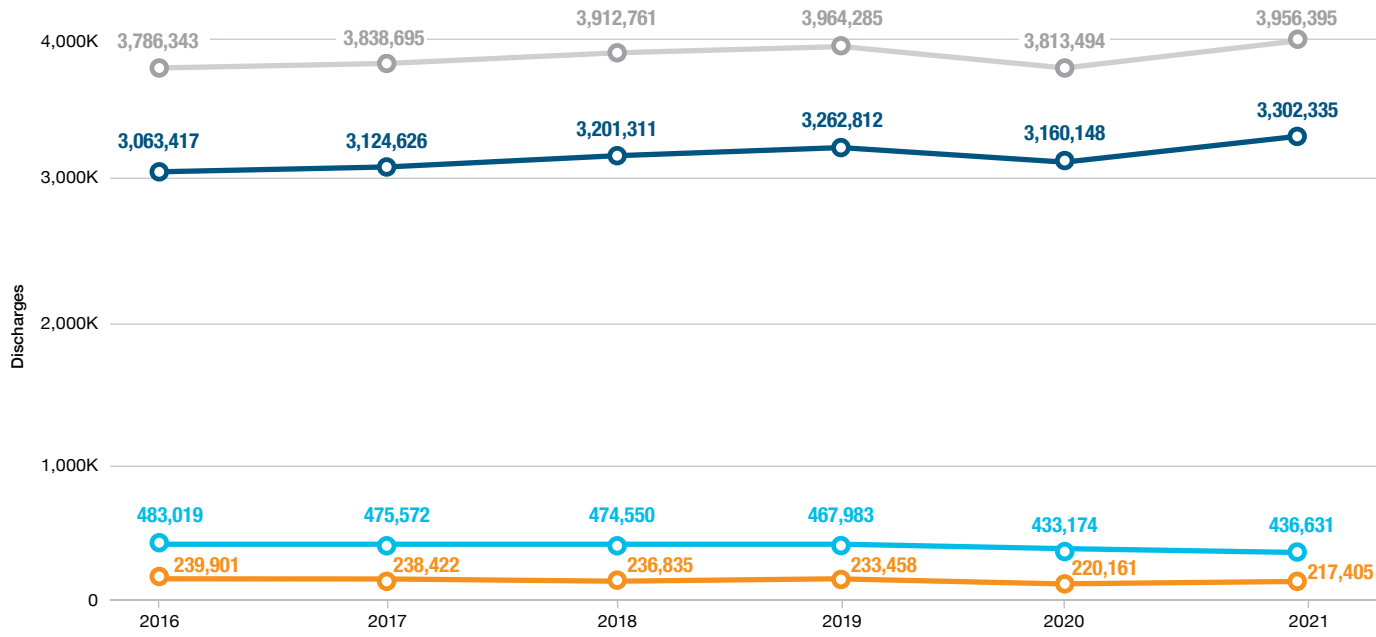


- Key**
- Home
 - HHA
 - SNF
 - Rehab
 - Hospice
 - Expired
 - Other

Note: Discharge setting was classified into one of five categories: Home, Home with Home Health Agency (HHA), Skilled Nursing Facility (SNF), Rehabilitation (or rehab), Hospice, Expired and Other. Figures for discharge setting may not sum to the total values due to rounding and because they exclude a small number of discharges with missing discharge setting information. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

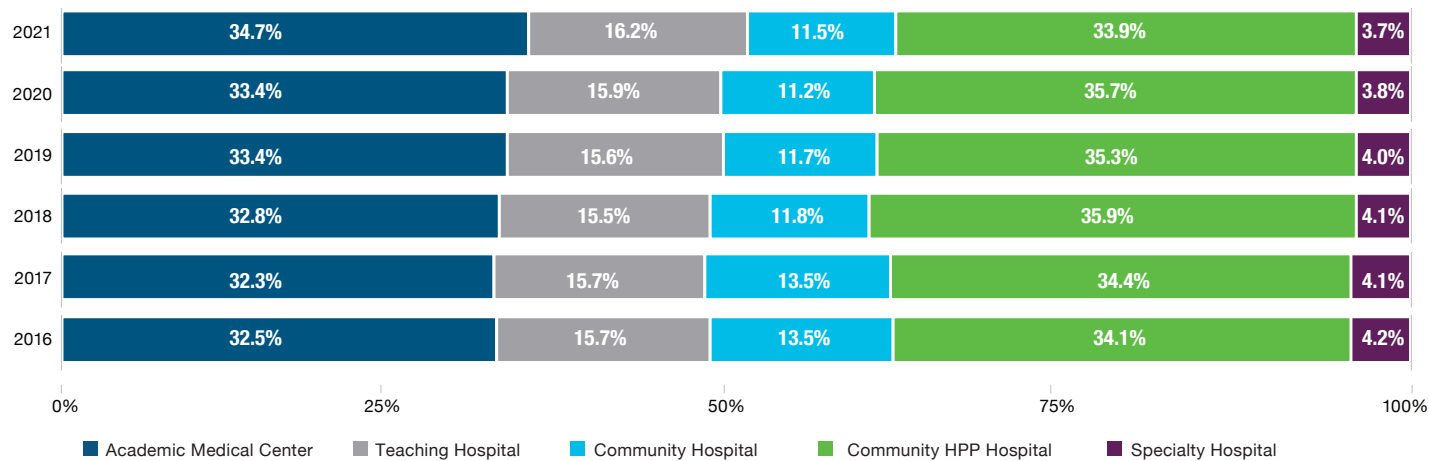
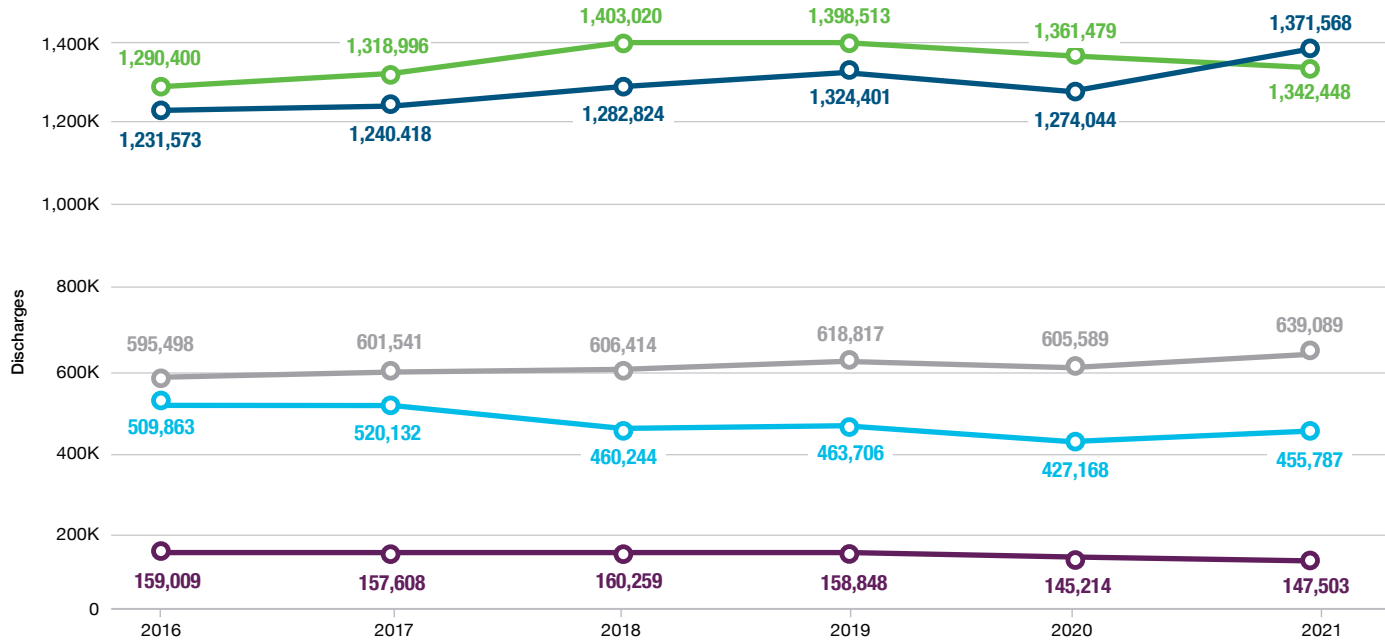
Total Patient Days of Care, FFY 2016-2021



Note: Discharges were grouped into one of three groups: any discharge with an obstetric (OB) primary diagnosis, adult (age 18+) without an OB primary diagnosis and pediatric (age 0-17) without an OB primary diagnosis. Percentages may not sum to 100% due to rounding and because they exclude a small number of discharges with missing data. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

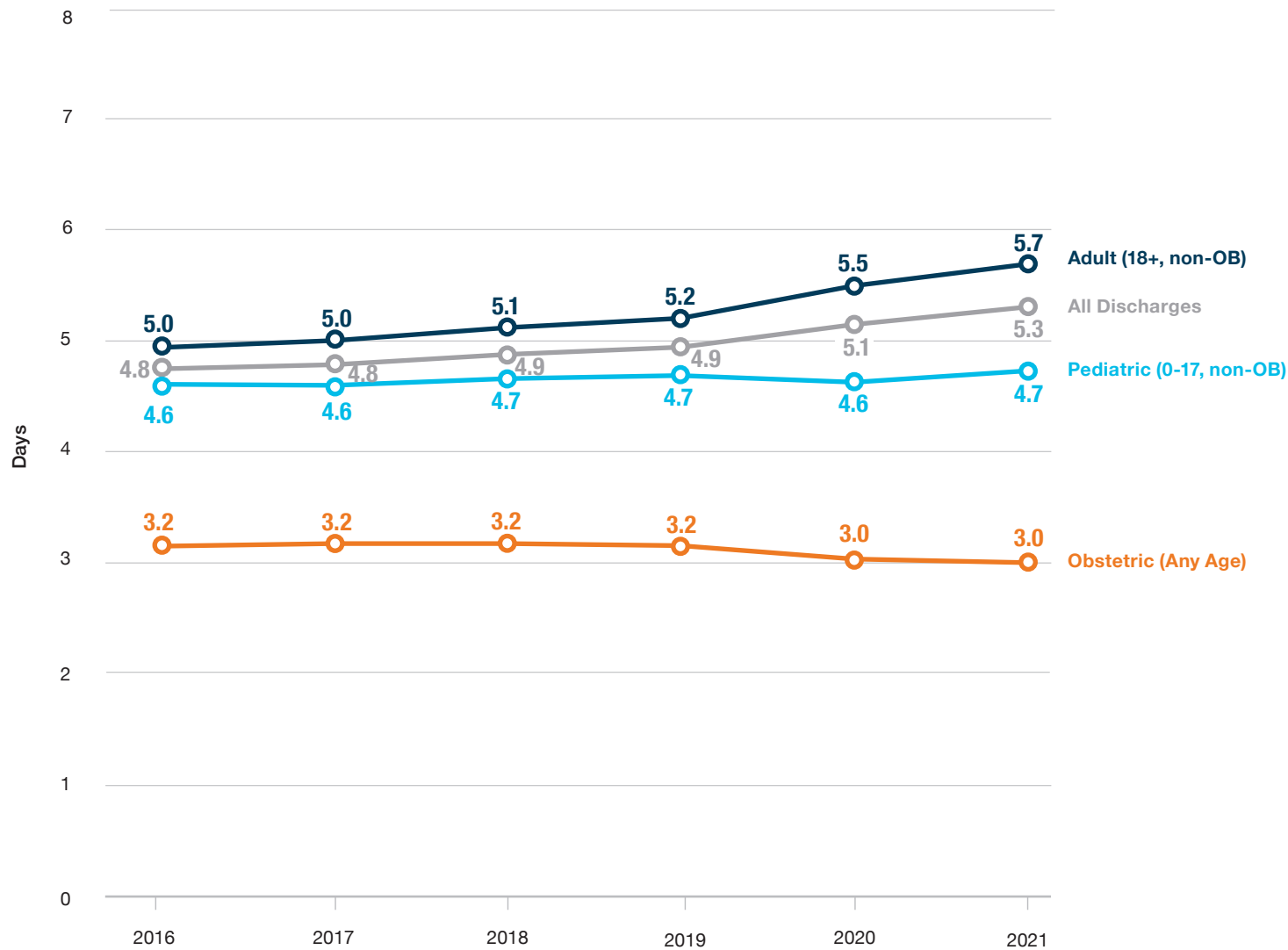
Total Patient Days of Care by Hospital Cohort, FFY 2016-2021



Note: Each acute care hospital is assigned to one of five mutually exclusive hospital groups: Academic Medical Centers (AMCs), teaching hospitals other than AMCs, community-High Public Payer (HPP) hospitals, other community hospitals, and specialty hospitals. Hospital characteristics are assessed at the end of the state fiscal year. Percentages may not sum to 100% due to rounding. Due to incomplete data in FFY 2021, one Community HPP Hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

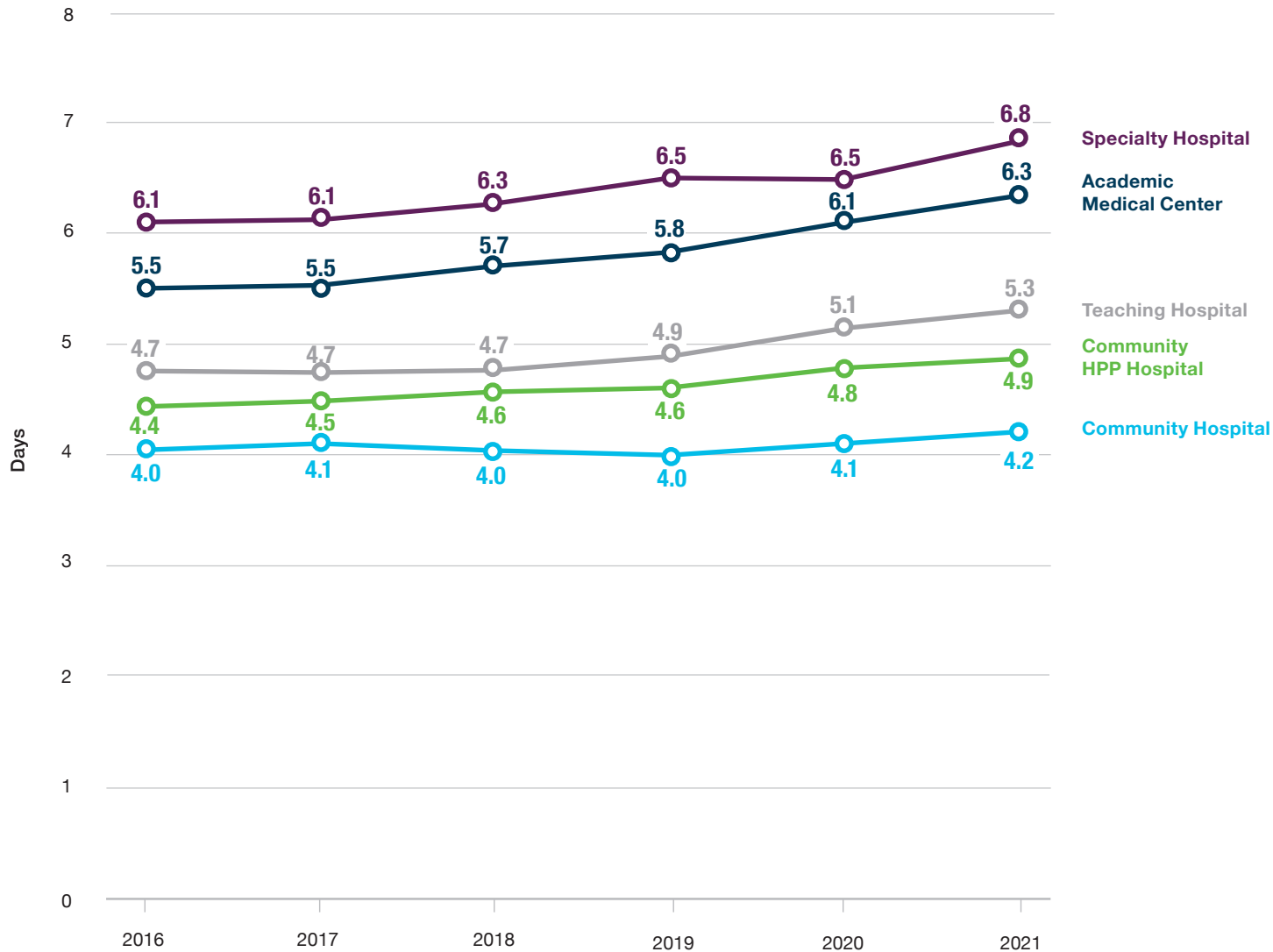
Average Length of Stay, FFY 2016-2021



Note: Discharges were grouped into one of three groups: any discharge with an obstetric (OB) primary diagnosis, adult (age 18+) without an OB primary diagnosis and pediatric (age 0-17) without an OB primary diagnosis. Percentages may not sum to 100% due to rounding and because they exclude a small number of discharges with missing data. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

Average Length of Stay by Hospital Cohort, FFY 2016-2021



Note: Each acute care hospital is assigned to one of five mutually exclusive hospital groups: Academic Medical Centers (AMCs), teaching hospitals other than AMCs, community-High Public Payer (HPP) hospitals, other community hospitals, and specialty hospitals. Hospital characteristics are assessed at the end of the state fiscal year. Percentages may not sum to 100% due to rounding. Due to incomplete data in FFY 2021, one Community HPP Hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

SECTION 3:

Intensive Care Utilization

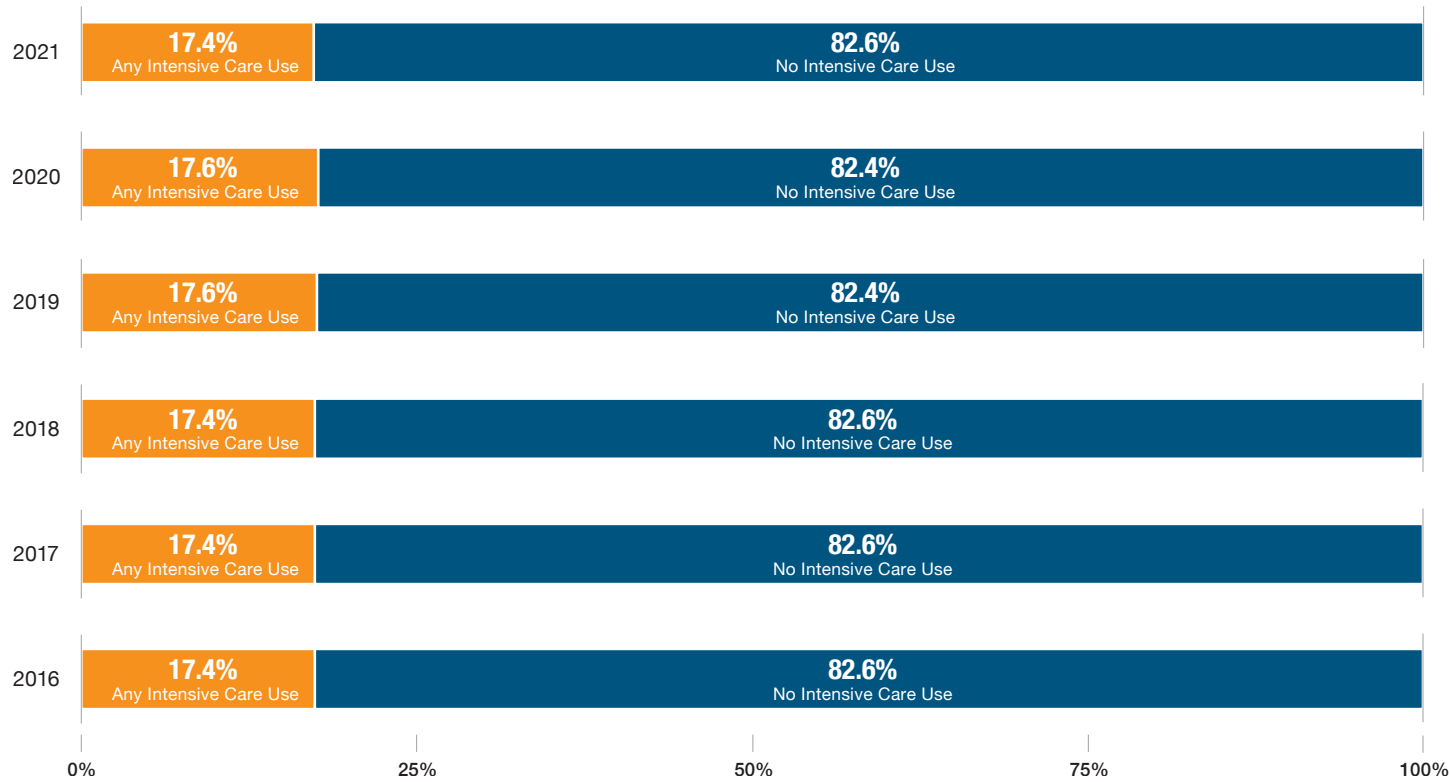
A discharge was indicated as having any intensive care use if there were any charges with a revenue code associated with the Intensive Care Unit (ICU), Cardiac Care Unit (CCU), Pediatric ICU (PICU), Neonatal ICU (NICU), or any other type of intensive care. For a list of relevant revenue centers, see the [technical appendix](#). Unless noted, key findings refer to data year 2021.

- Between 2016 and 2021, the share of hospitalizations with associated intensive care use remained stable at approximately one in six inpatient discharges.
- Over the six-year period, average lengths of stay and total patient days of care for hospitalizations with intensive care use increased by 19.7% and 9.9%,

respectively. The largest increases in the average length of stay for discharges with intensive care use occurred in 2019 and 2021.

- Intensive care use was most common in specialty hospitals (23.5%), AMCs (20.5%), and community hospitals serving a high public payer patient population (19.1%).
- Newborns aged less than one year had the lowest rates of intensive care use, at 9.6%, followed by adults aged 18-44 at 9.8%.
- Intensive care use varied by expected primary payer type, with lower rates of any intensive care use among commercial insurance and Medicaid. ■

Hospital Inpatient Discharges With and Without Use of Intensive Care, FFY 2016-2021

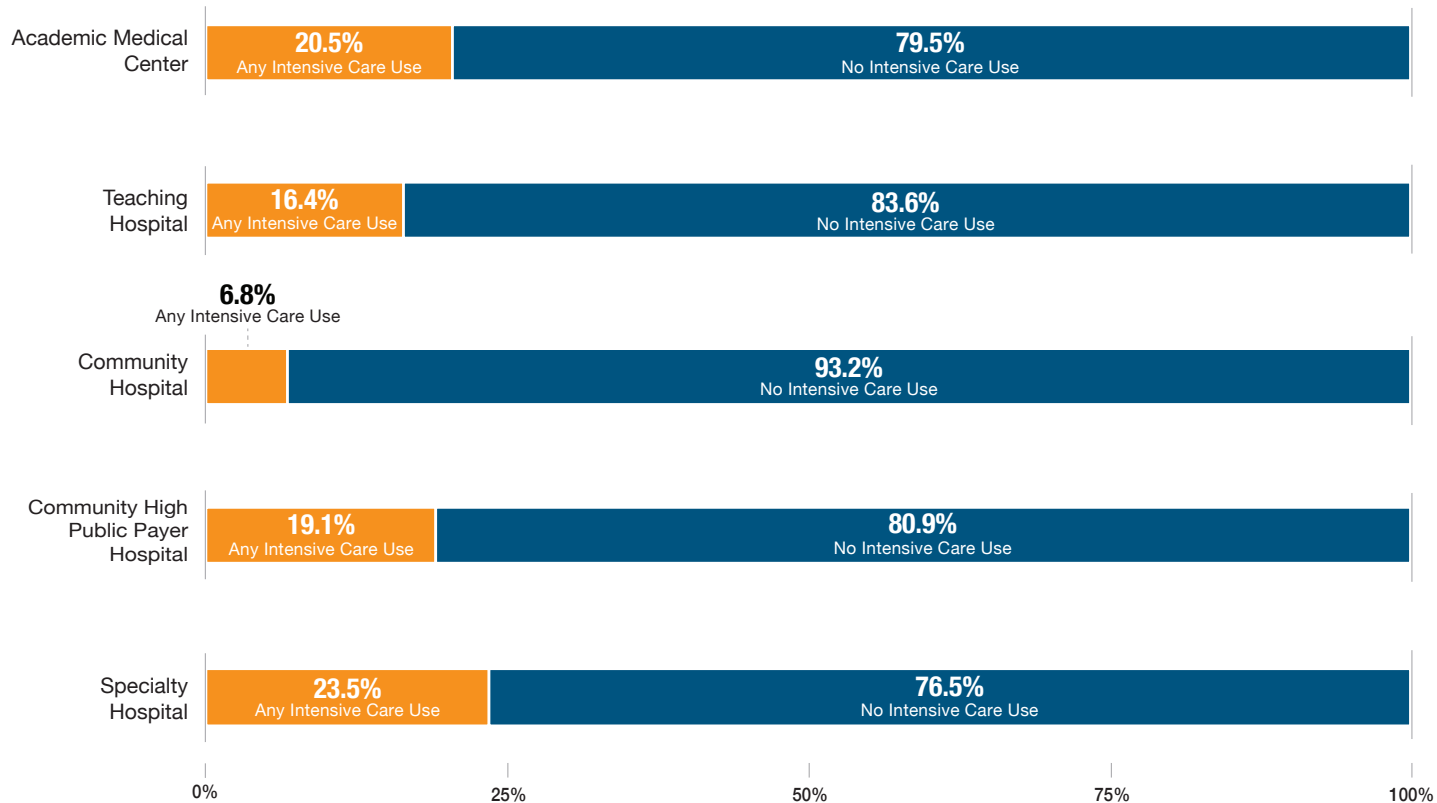


	2016	2017	2018	2019	2020	2021
Any Intensive Care Use	138,602	139,405	139,560	140,667	130,645	129,351
No Intensive Care Use	657,820	662,013	661,881	660,550	610,429	615,277
Total	796,422	801,418	801,441	801,217	741,074	744,628

Note: A discharge was characterized as having intensive care use if the discharge had any non-zero charge for revenue codes associated with intensive care services. These include stays in the Intensive Care Unit (ICU), Coronary Care Unit (CCU), Neonatal Intensive Care Unit (NICU), Pediatric Intensive Care Unit (PICU), and other intensive care use. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

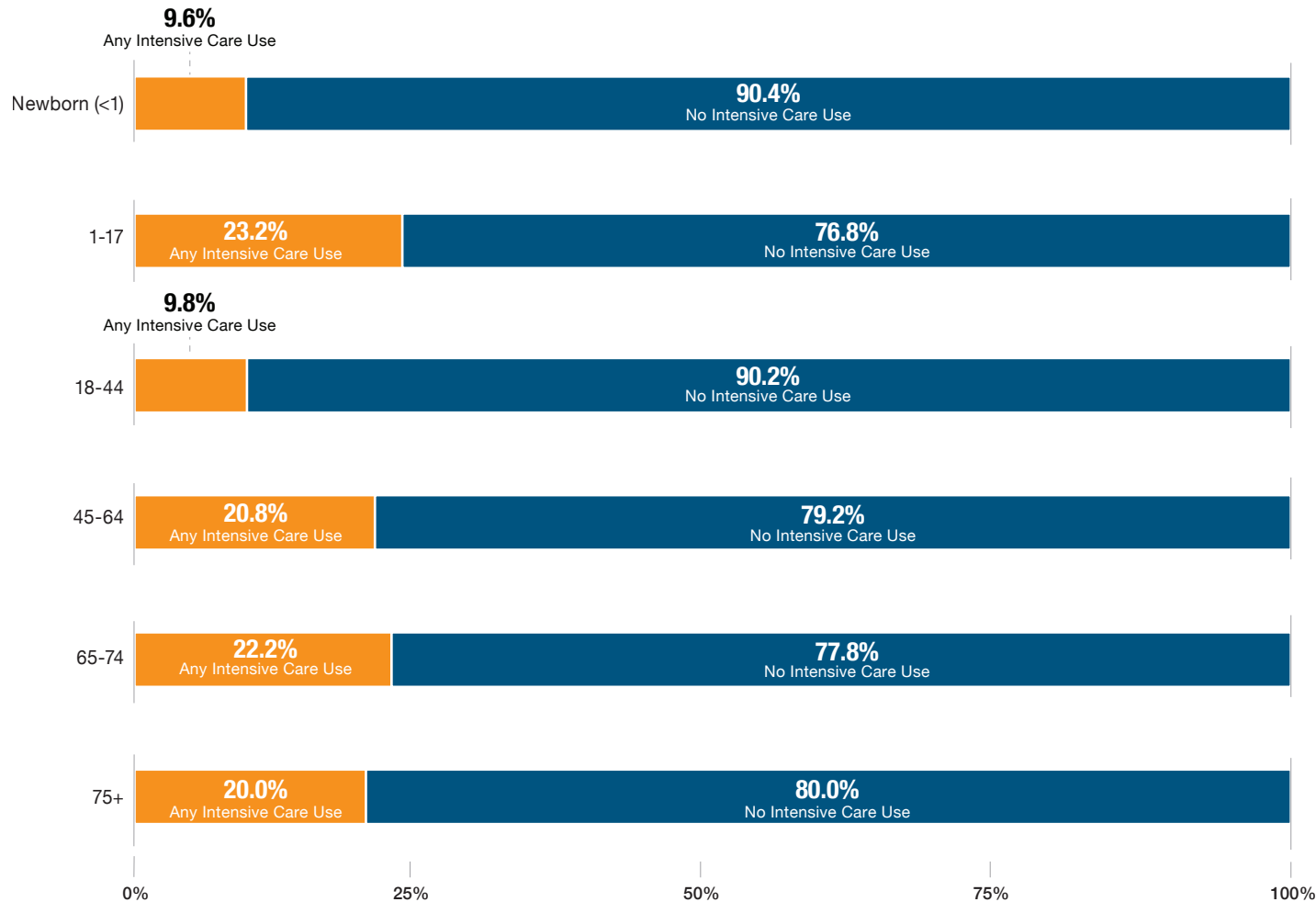
Hospital Inpatient Discharges With and Without Use of Intensive Care by Hospital Cohort, FFY 2021



Note: A discharge was characterized as having intensive care use if the discharge had any non-zero charge for revenue codes associated with intensive care services. These include stays in the Intensive Care Unit (ICU), Coronary Care Unit (CCU), Neonatal Intensive Care Unit (NICU), Pediatric Intensive Care Unit (PICU), and other intensive care use. Due to incomplete data in FFY 2021, one Community HPP Hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

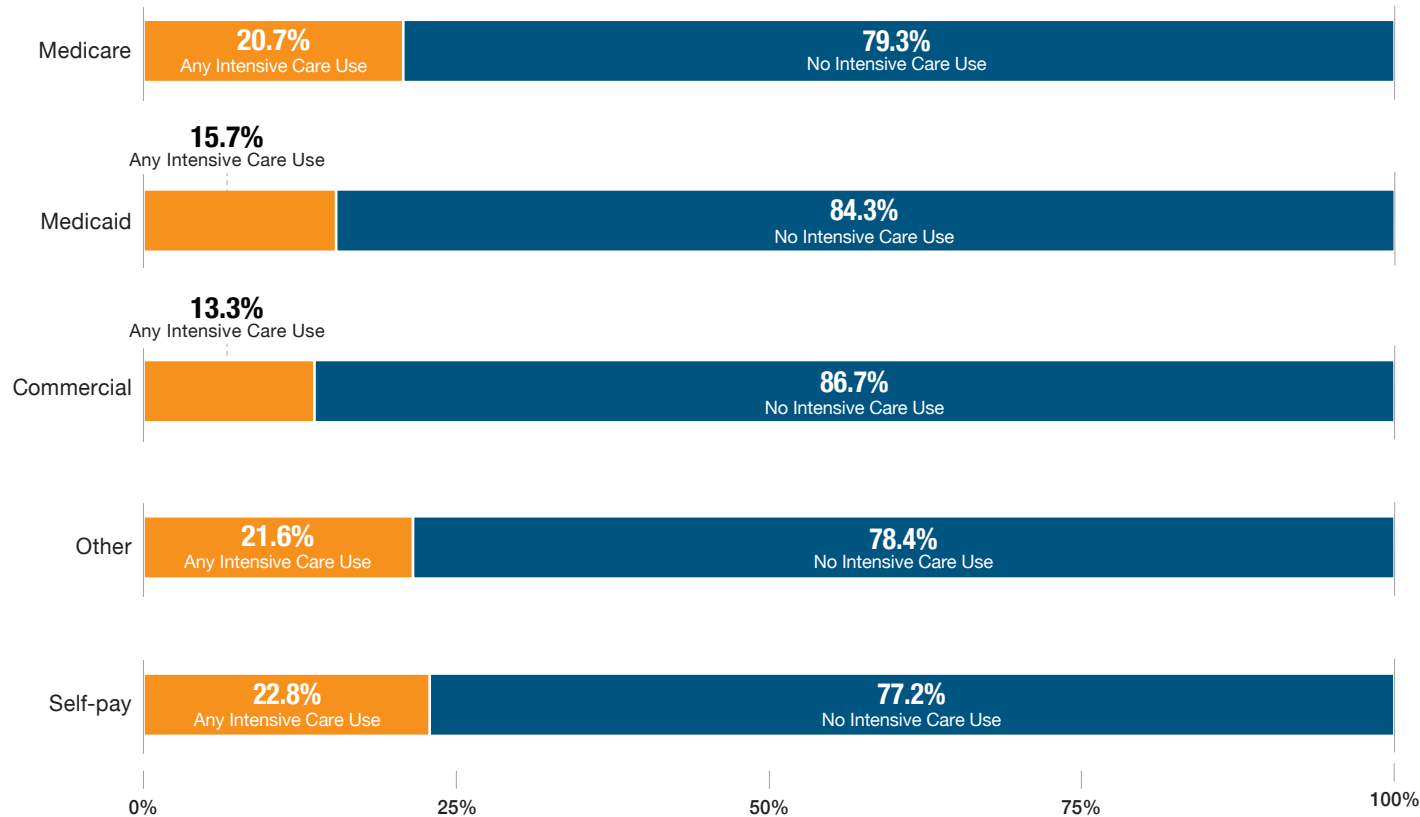
Hospital Inpatient Discharges With and Without Use of Intensive Care by Age Group, FFY 2021



Note: A discharge was characterized as having intensive care use if the discharge had any non-zero charge for revenue codes associated with intensive care services. These include stays in the Intensive Care Unit (ICU), Coronary Care Unit (CCU), Neonatal Intensive Care Unit (NICU), Pediatric Intensive Care Unit (PICU), and other intensive care use. A small number of discharges missing age information are excluded from this analysis. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

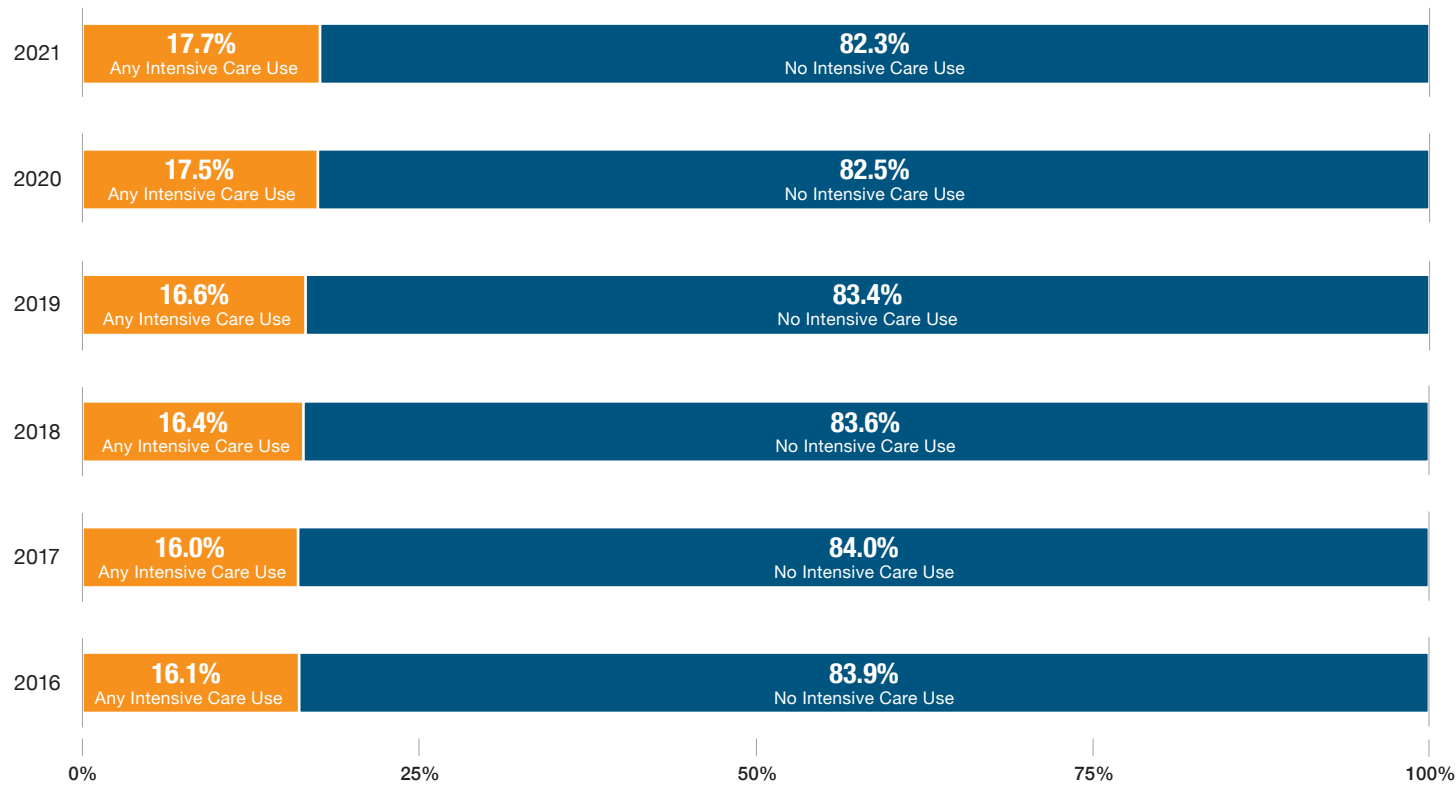
Hospital Inpatient Discharges With and Without Use of Intensive Care by Expected Primary Payer Type, FFY 2021



Note: A discharge was characterized as having intensive care use if the discharge had any non-zero charge for revenue codes associated with intensive care services. These include stays in the Intensive Care Unit (ICU), Coronary Care Unit (CCU), Neonatal Intensive Care Unit (NICU), Pediatric Intensive Care Unit (PICU), and other intensive care use. A small number of discharges with missing expected primary payer type information were excluded from this analysis. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

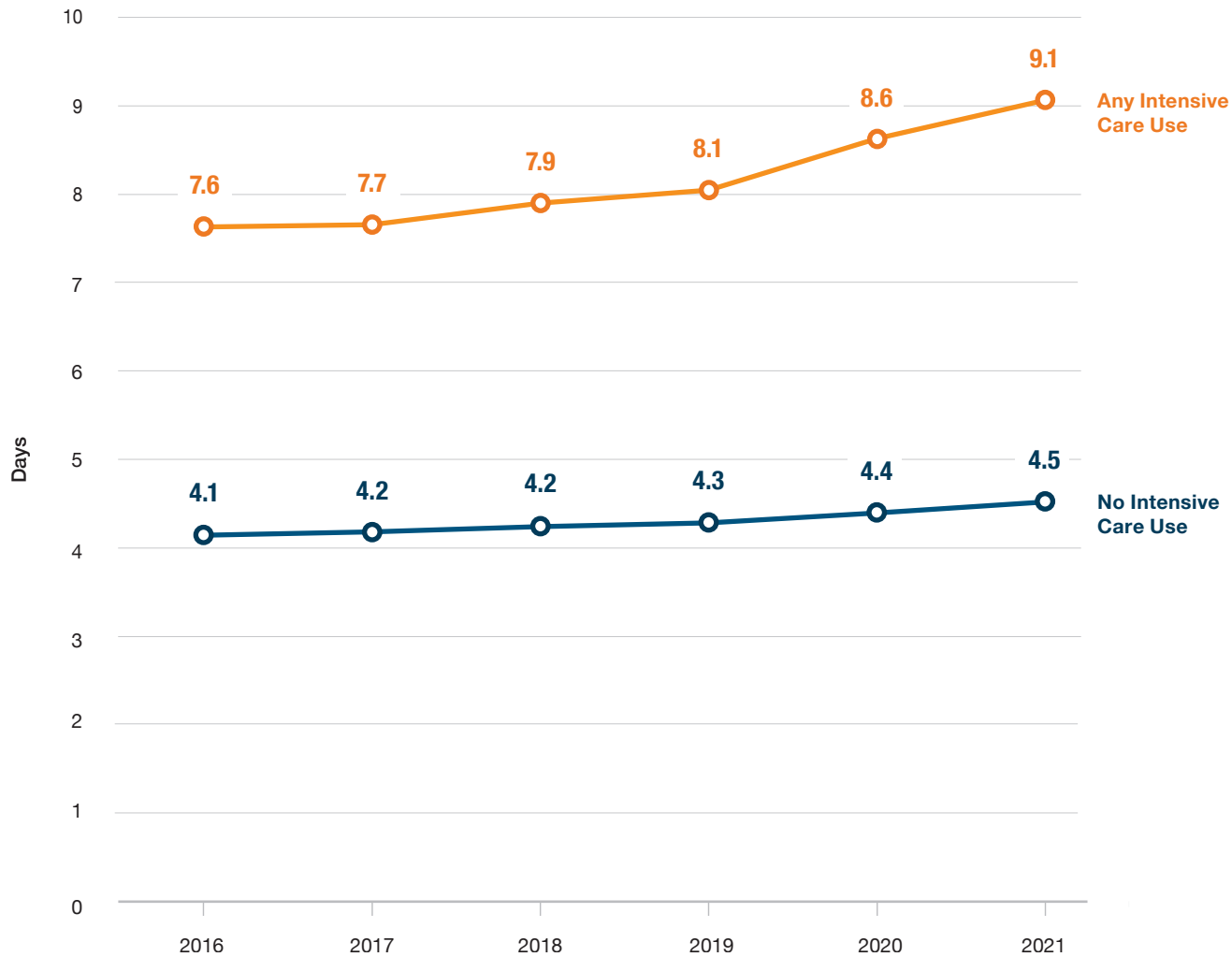
Inpatient Days of Care by Intensive Care Use, FFY 2016-2021



Note: A discharge was characterized as having intensive care use if the discharge had any non-zero charge for revenue codes associated with intensive care services. These include stays in the Intensive Care Unit (ICU), Coronary Care Unit (CCU), Neonatal Intensive Care Unit (NICU), Pediatric Intensive Care Unit (PICU), and other intensive care use. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

Average Length of Stay With and Without Use of Intensive Care, FFY 2016-2021



Note: A discharge was characterized as having intensive care use if the discharge had any non-zero charge for revenue codes associated with intensive care services. These include stays in the Intensive Care Unit (ICU), Coronary Care Unit (CCU), Neonatal Intensive Care Unit (NICU), Pediatric Intensive Care Unit (PICU), and other intensive care use. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

SECTION 4:

Type and Severity of Hospitalization

Hospitalizations were categorized using three classification schemas in this section.

- Inpatient discharges were classified into one of five mutually exclusive hospitalization types based on the primary diagnosis for that hospital stay: maternal/neonatal, mental health/substance use, injury, surgical, or medical. These categories are based on a hierarchical classification developed by the Agency for Healthcare Research and Quality (AHRQ; see [technical appendix](#) for details.)
- Discharges were also classified into All-Patient Refined Diagnosis Related Groups (APR-DRGs), a severity and risk-adjusted classification system that provides means of adjusting for patient differences across hospitals. The severity of illness (SOI) is a classification of the functional status of a patient, defined as the

extent of physiologic decomposition or organ system loss of function. Within each APR-DRG, discharges are assigned to one of four severity groups indicating minor, moderate, major, or extreme severity.

- Primary diagnoses and principal procedure codes were grouped into clinically meaningful categories using the Clinical Classifications Software – Refined for ICD-10-CM (CCSR) and Clinical Classifications Software – Refined for ICD-10-PCS (CCSR) tools, respectively (see [technical appendix](#) for more information).

Unless noted, key findings refer to data year 2021.

Hospitalization Type, APR-DRGs, and SOI

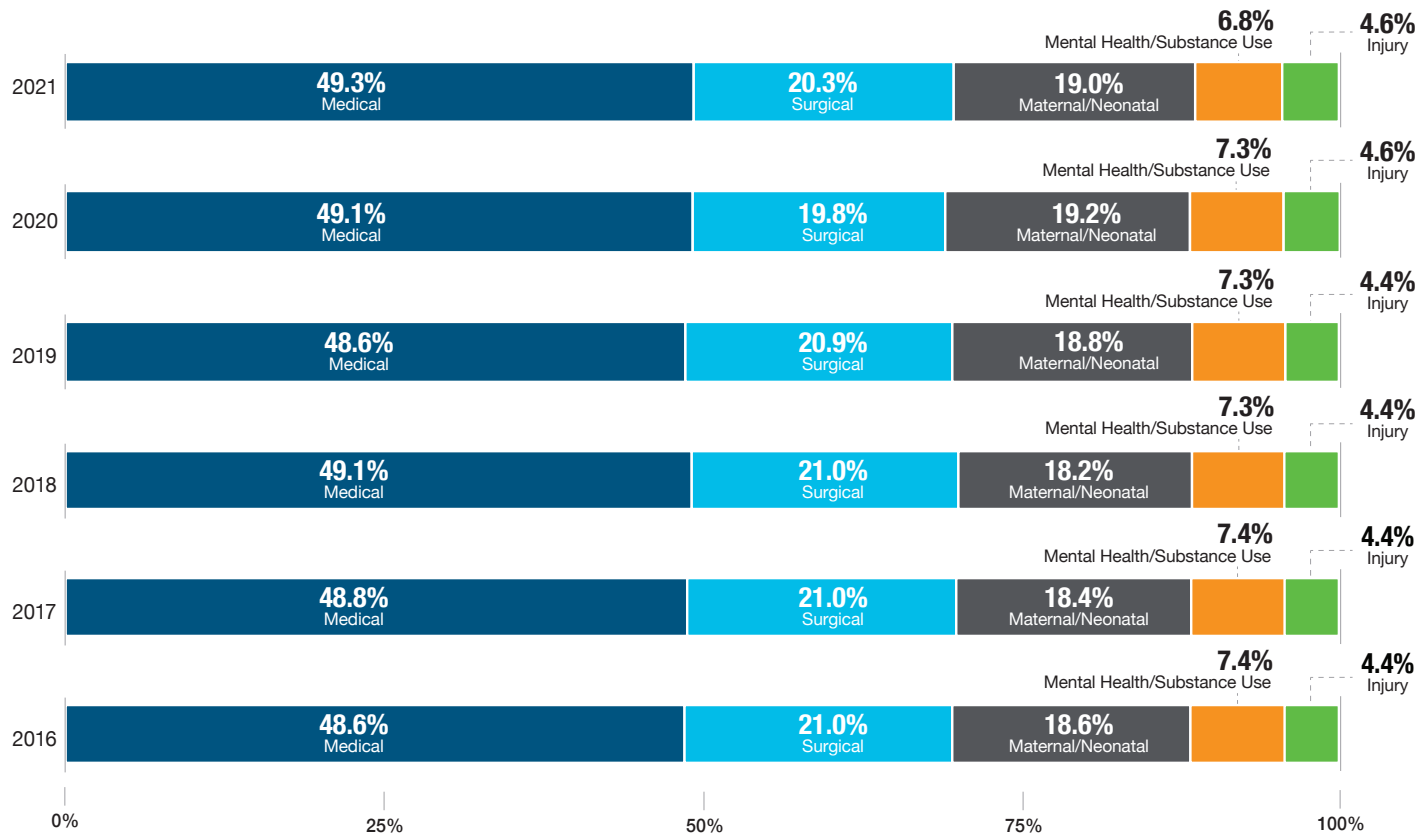
- Over the six-year period, more than two-thirds of hospitalizations were categorized as either surgical or medical.

- Between 2016 and 2021, the share of discharges classified at the highest levels (Major or Extreme) of severity of illness (SOI) increased from 31.7% to 41.9%.
- Three of the ten most common APR-DRGs were associated with childbirth and neonatal care. Other common APR-DRGs include septicemia, major respiratory infections and inflammations (including most discharges associated with COVID-19), and heart failure.
- Among the most common APR-DRGs, septicemia had the longest average length of stay at 6.4 days, followed by major respiratory infections and inflammations at 6.1 days.
- The average length of stay for those with “Extreme” SOI was 12.1 days, followed by “Major” SOI at 5.9 days, “Moderate” SOI at 4.2 days and “Minor” SOI at 2.8 days.

Diagnoses and Procedures

- Pediatric patients were most commonly seen in the inpatient setting during their birth, with “liveborn status” as the most common primary diagnosis among pediatric discharges. Other common pediatric primary diagnoses included depressive disorders, jaundice and epilepsy or convulsions.
- Among the non-obstetric adult population, the most common primary diagnoses include septicemia, heart failure, and COVID-19.
- The most common principal procedure codes were associated with childbirth and neonatal care, including child delivery, C-sections, vaccinations and inoculations, and circumcision.
- Other common principal procedures included potential COVID-19 therapies, transfusion of blood and blood products, substance use detoxification, and hip and knee replacements. ■

Hospital Inpatient Discharges by Hospitalization Type, FFY 2016-2021

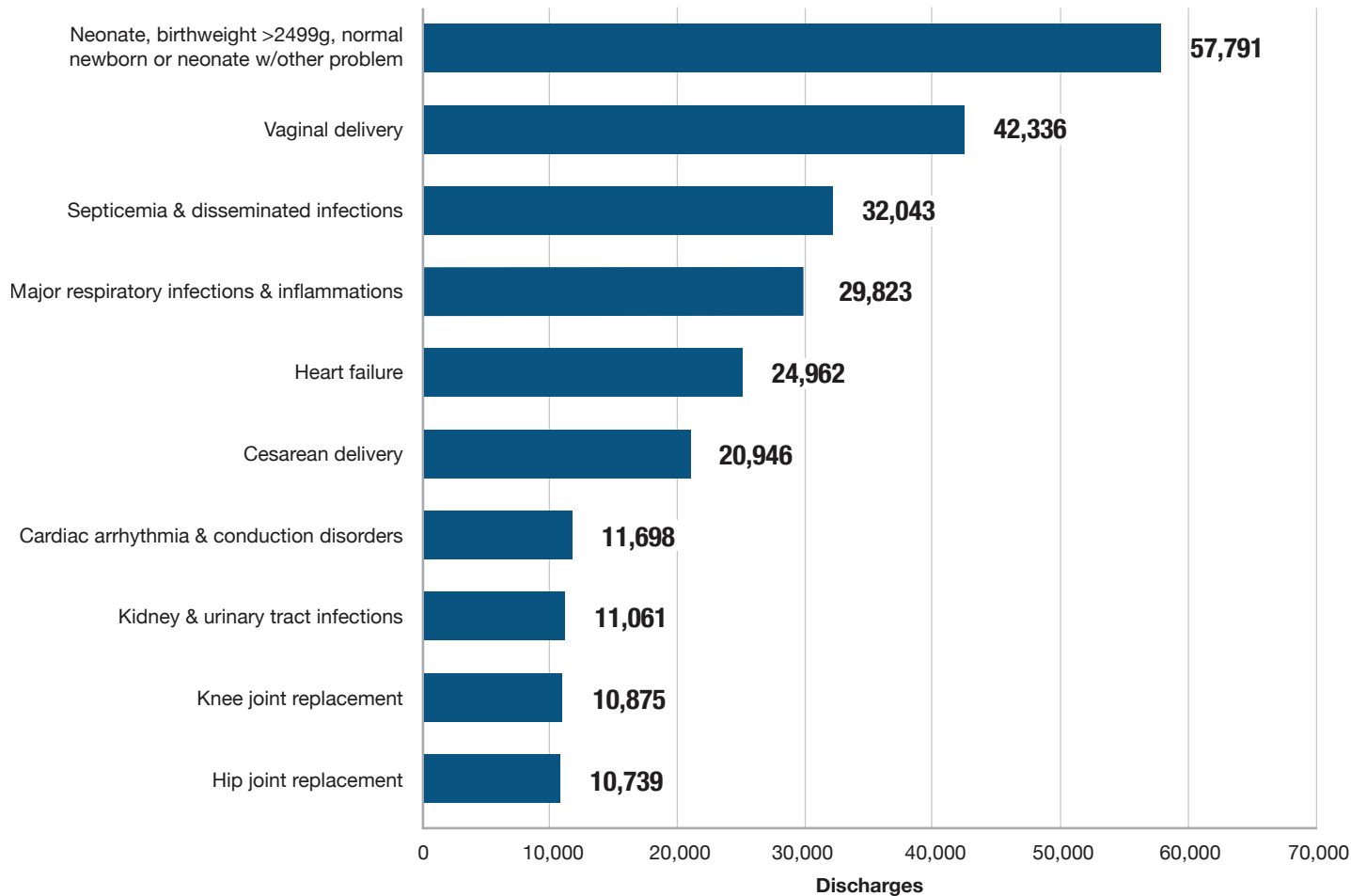


	2016	2017	2018	2019	2020	2021
Medical	386,748	391,076	393,293	389,787	364,224	366,761
Surgical	166,862	168,653	167,944	167,201	146,786	151,234
Maternal/Neonatal	148,324	147,273	146,201	150,619	142,306	141,559
Mental Health/Substance Use	59,212	59,178	58,557	58,240	53,768	50,504
Injury	35,275	35,237	35,445	35,370	33,989	34,562
Total	796,422	801,418	801,441	801,217	741,074	744,628

Note: Each hospitalization was assigned to a single hospitalization type hierarchically using a methodology developed by the Agency for Health Care Quality and Research. The principal diagnosis for the hospital stay was used to categorize all discharges into one of five mutually exclusive hospitalization types in the following order: maternal/neonatal, mental health/substance use, injury, surgical, and medical. Figures may not sum to totals due to rounding and because a small number of discharges missing diagnosis information were excluded. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

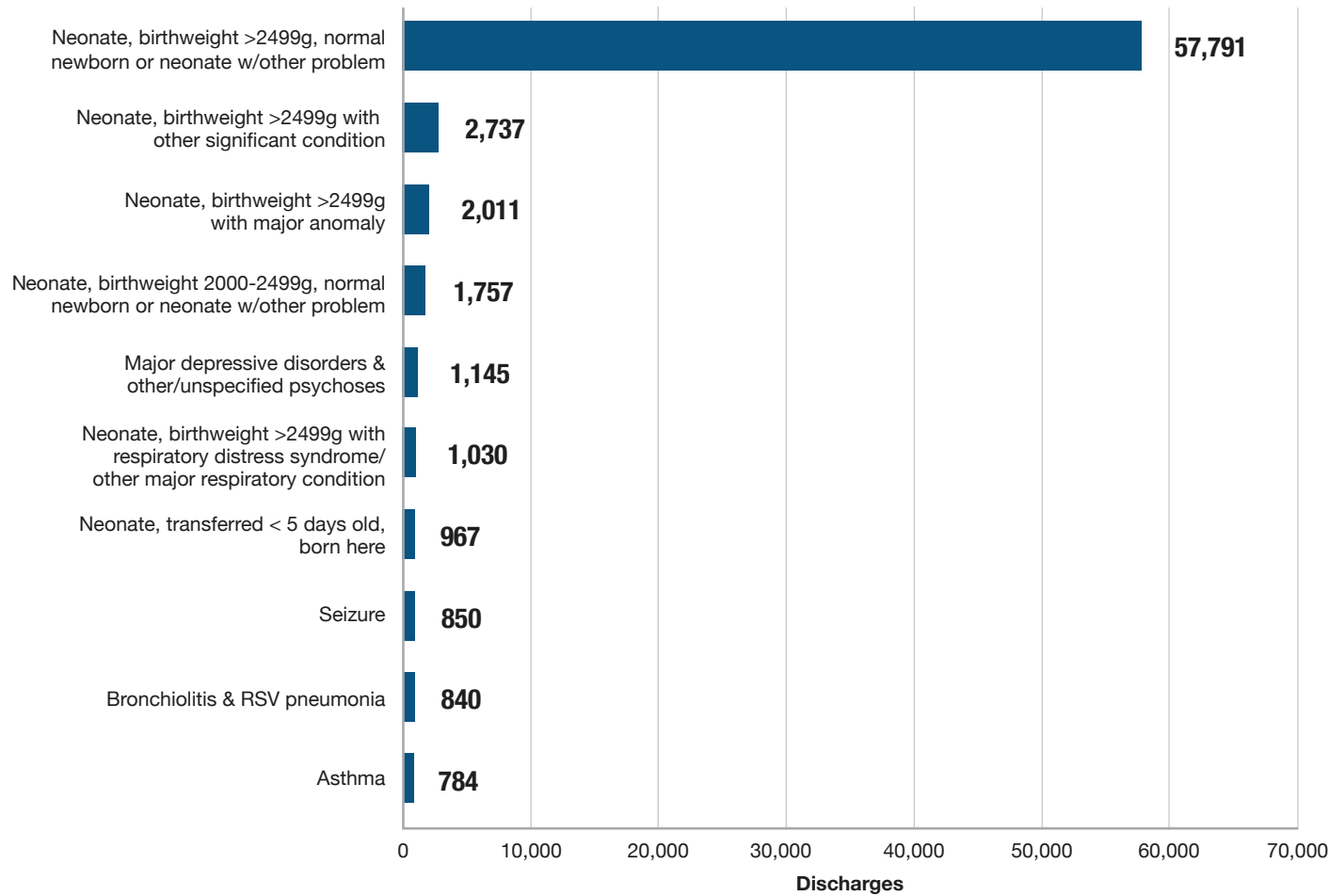
Hospital Inpatient Discharges by Most Common APR-DRGs, FFY 2021



Note: The All Patient Refined–Diagnosis Related Groups (APR-DRGs) are a severity and risk-adjusted classification system that provides means of adjusting for patient differences. The discharge diagnosis classification is based on APR-DRG version 34.0. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

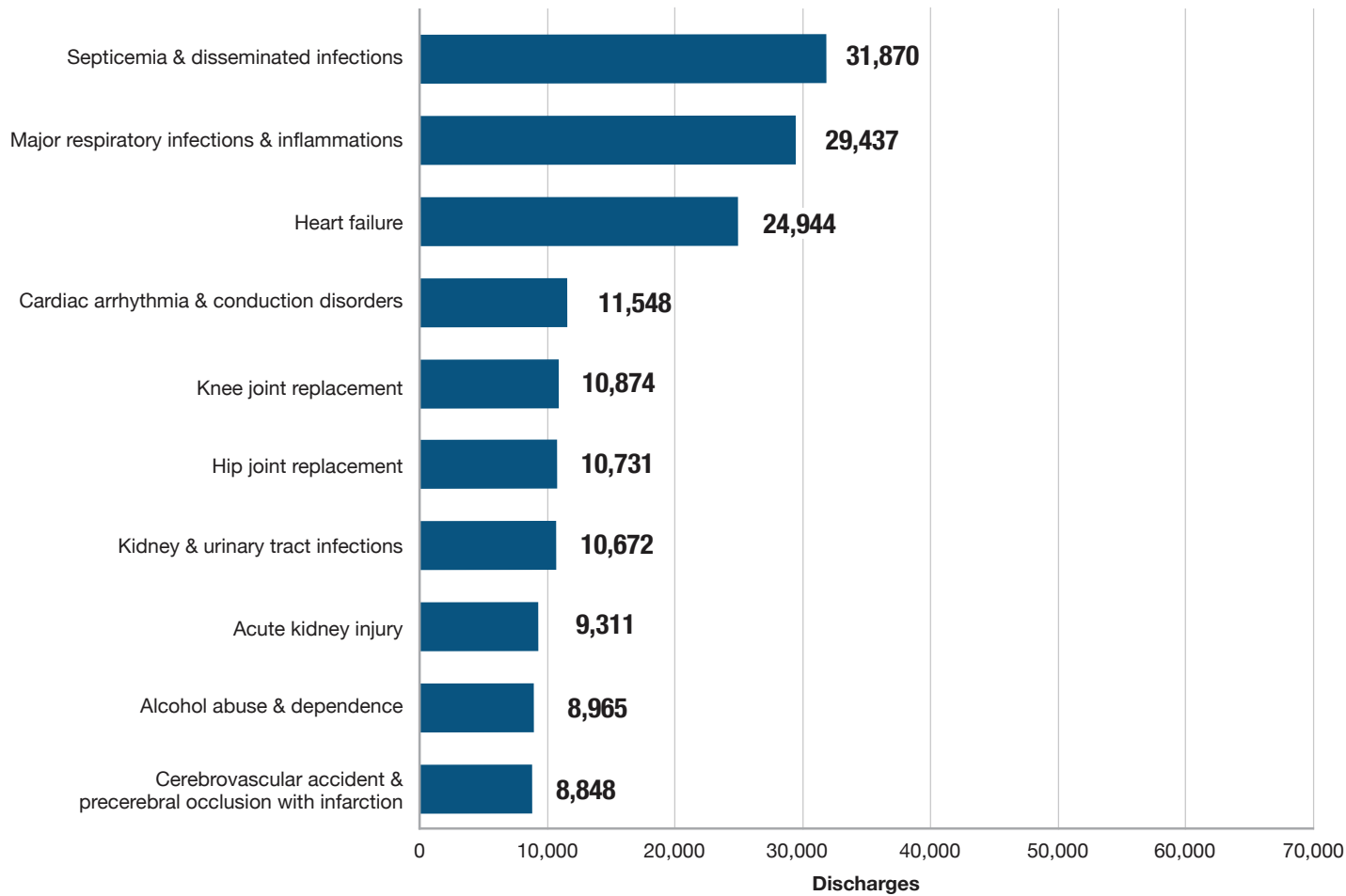
Hospital Inpatient Discharges by Most Common APR-DRGs among Non-Obstetric Pediatric Patients, FFY 2021



Note: The All Patient Refined–Diagnosis Related Groups (APR-DRGs) are a severity and risk-adjusted classification system that provides means of adjusting for patient differences. The discharge diagnosis classification is based on APR-DRG version 34.0. Discharges were grouped into one of three groups: any discharge with an obstetric (OB) primary diagnosis, adult (age 18+) without an OB primary diagnosis and pediatric (age 0-17) without an OB primary diagnosis. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

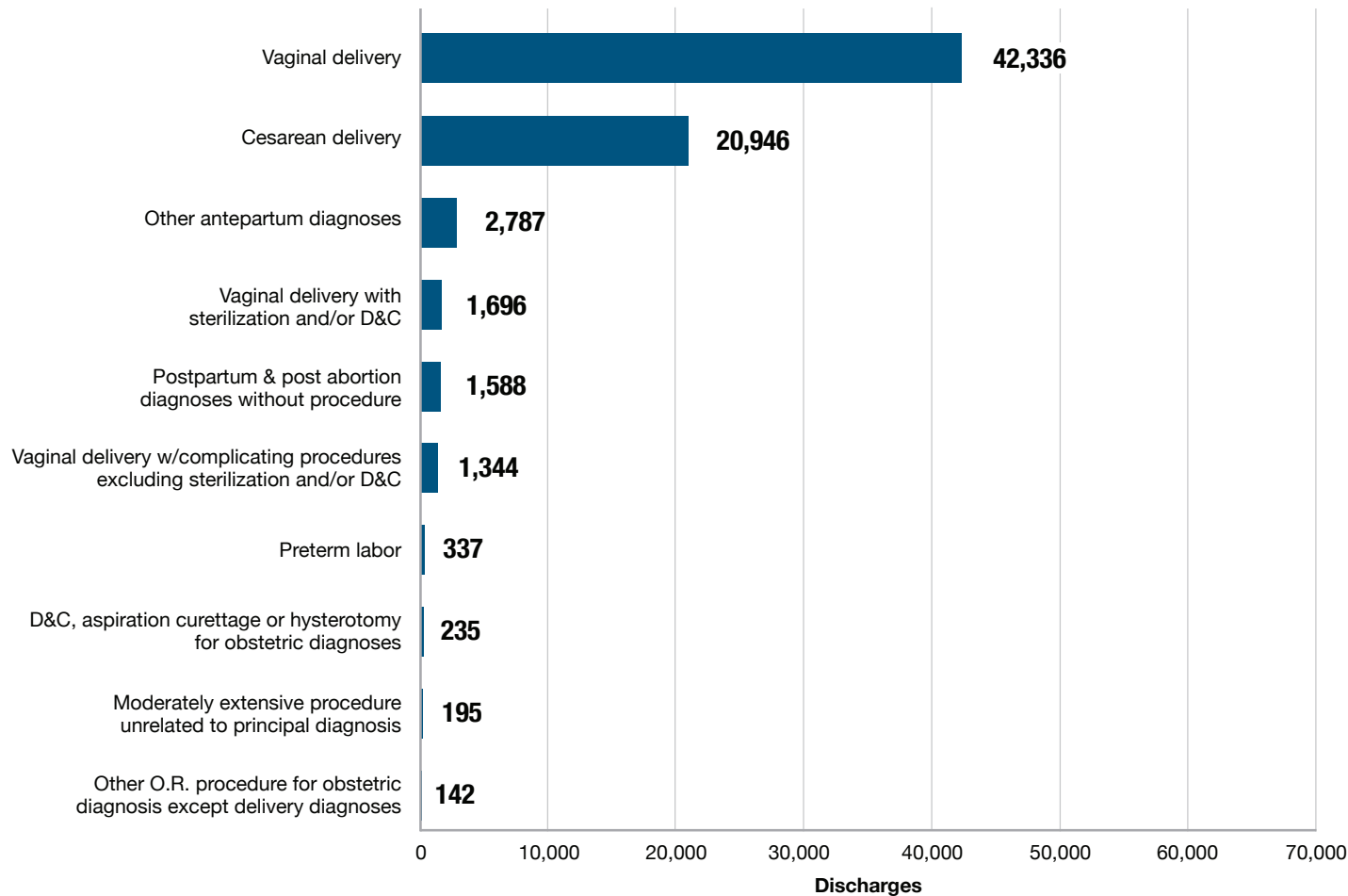
Hospital Inpatient Discharges by Most Common APR-DRGs among Non-Obstetric Patients Aged 18+, FFY 2021



Note: The All Patient Refined–Diagnosis Related Groups (APR-DRGs) are a severity and risk-adjusted classification system that provides means of adjusting for patient differences. The discharge diagnosis classification is based on APR-DRG version 34.0. Discharges were grouped into one of three groups: any discharge with an obstetric (OB) primary diagnosis, adult (age 18+) without an OB primary diagnosis and pediatric (age 0-17) without an OB primary diagnosis. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

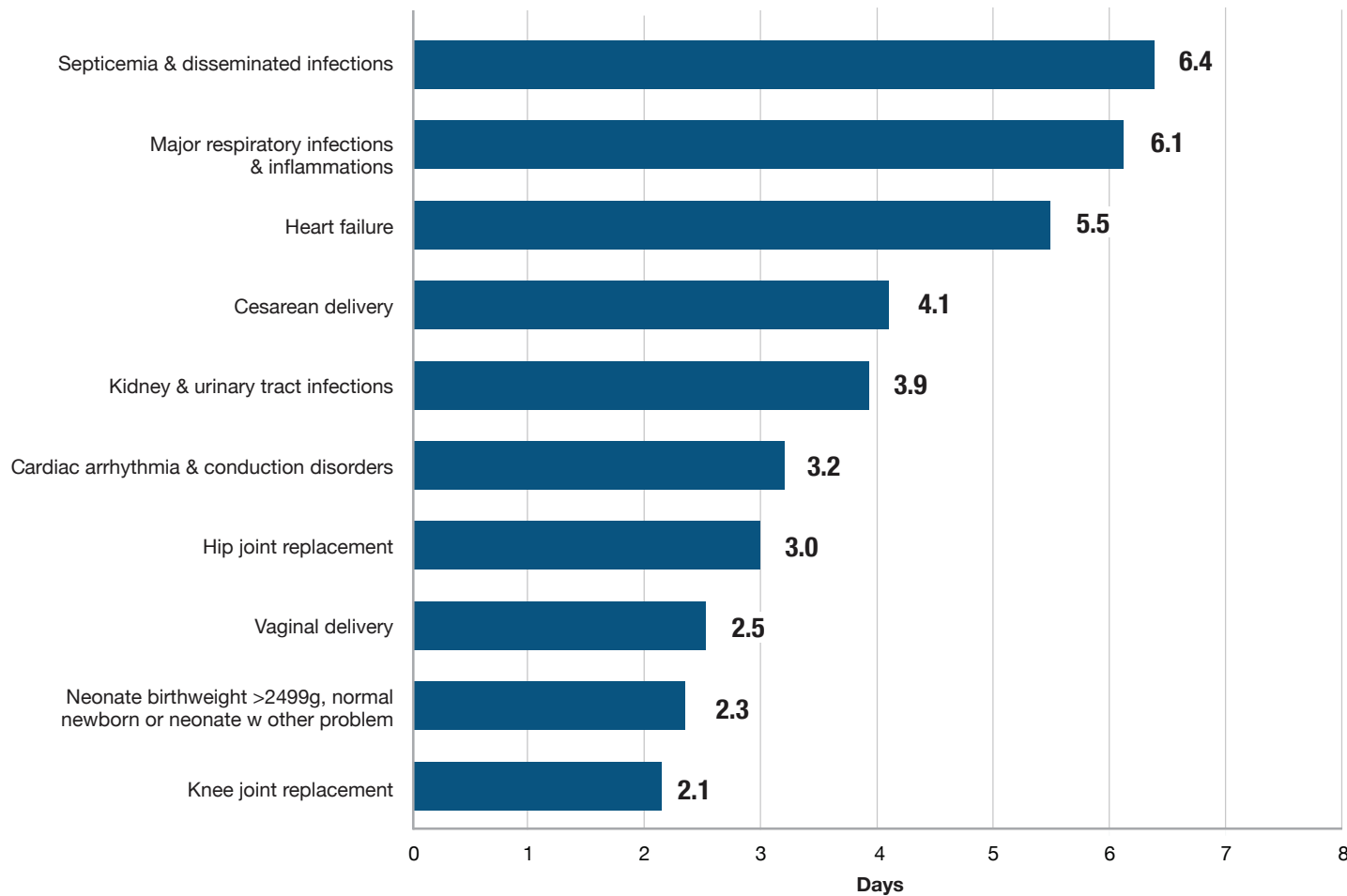
Hospital Inpatient Discharges by Most Common APR-DRGs among All Obstetric Patients, FFY 2021



Note: The All Patient Refined–Diagnosis Related Groups (APR-DRGs) are a severity and risk-adjusted classification system that provides means of adjusting for patient differences. The discharge diagnosis classification is based on APR-DRG version 34.0. Discharges were grouped into one of three groups: any discharge with an obstetric (OB) primary diagnosis, adult (age 18+) without an OB primary diagnosis and pediatric (age 0-17) without an OB primary diagnosis. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

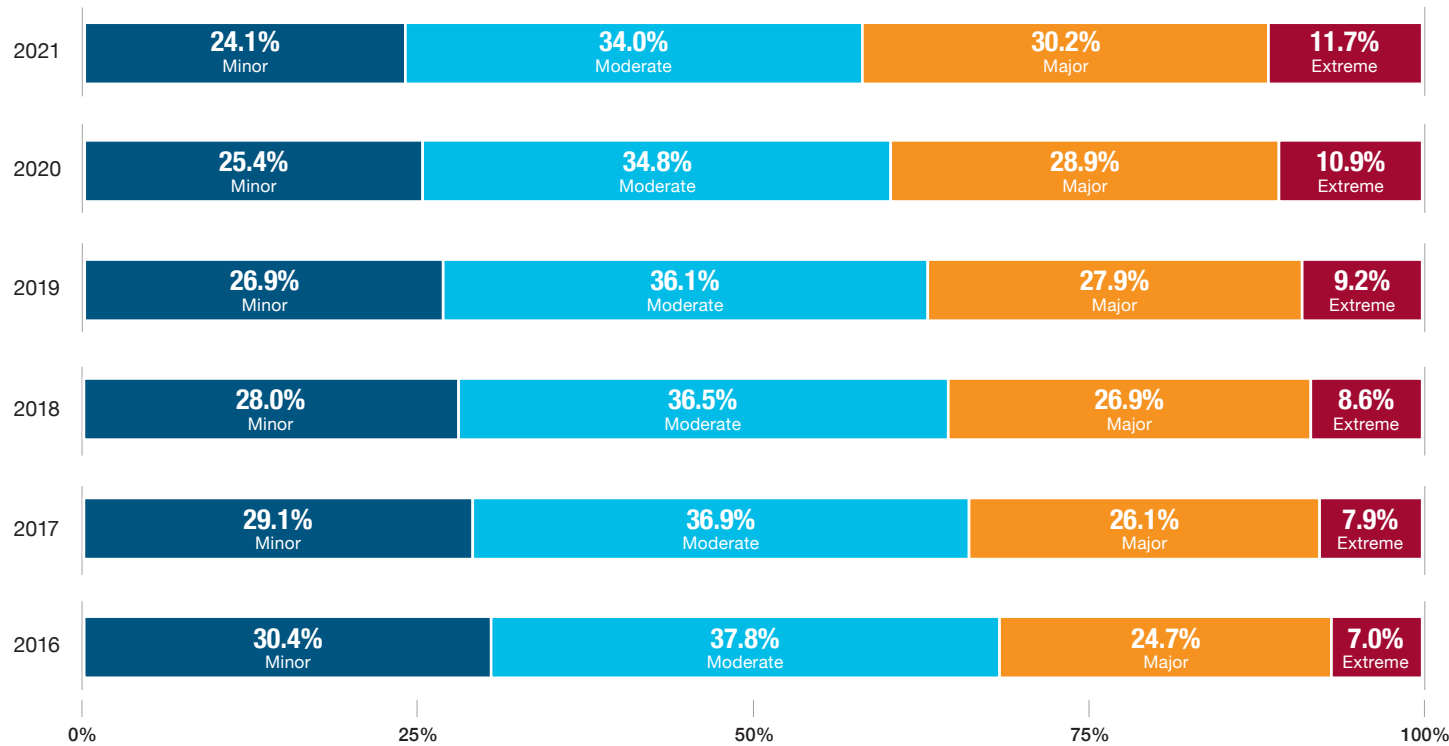
Average Length of Stay by Most Common APR-DRGs, FFY 2021



Note: The All Patient Refined–Diagnosis Related Groups (APR-DRGs) are a severity and risk-adjusted classification system that provides means of adjusting for patient differences. The discharge diagnosis classification is based on APR-DRG version 34.0. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

Hospital Inpatient Discharges by APR-DRG Severity, FFY 2016-2021

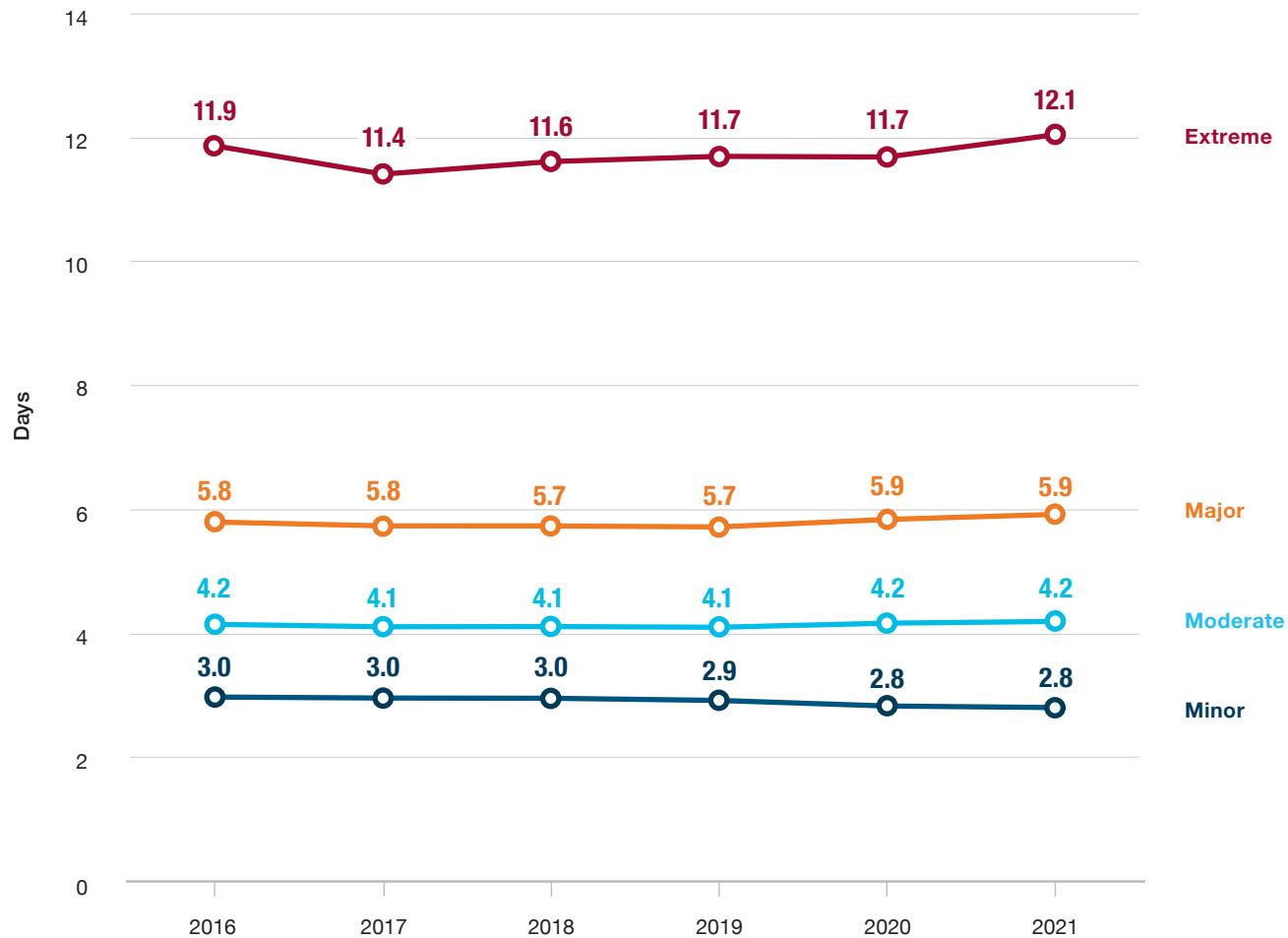


	2016	2017	2018	2019	2020	2021
Minor	242,455	233,197	224,470	215,190	188,182	179,412
Moderate	301,318	295,859	292,617	289,020	257,952	253,184
Major	196,650	208,974	215,701	223,374	214,020	224,902
Extreme	55,911	63,335	68,578	73,515	80,872	87,094
Total	796,422	801,418	801,441	801,217	741,074	744,628

Note: The All Patient Refined-Diagnosis Related Groups (APR-DRGs) are a severity and risk-adjusted classification system that provides a means of adjusting for patient differences. All APR-DRGs have 4 severity of illness subclasses calculated mainly on the patient's provided secondary diagnoses as well as the patient's age and non-operating room procedures (1="Minor", 2="Moderate", 3="Major", and 4="Extreme"). The discharge diagnosis classification is based on APR DRG version 34.0. Percentages may not sum to the total due to rounding and because a small number of discharges missing APR-DRG and SOI information were excluded. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

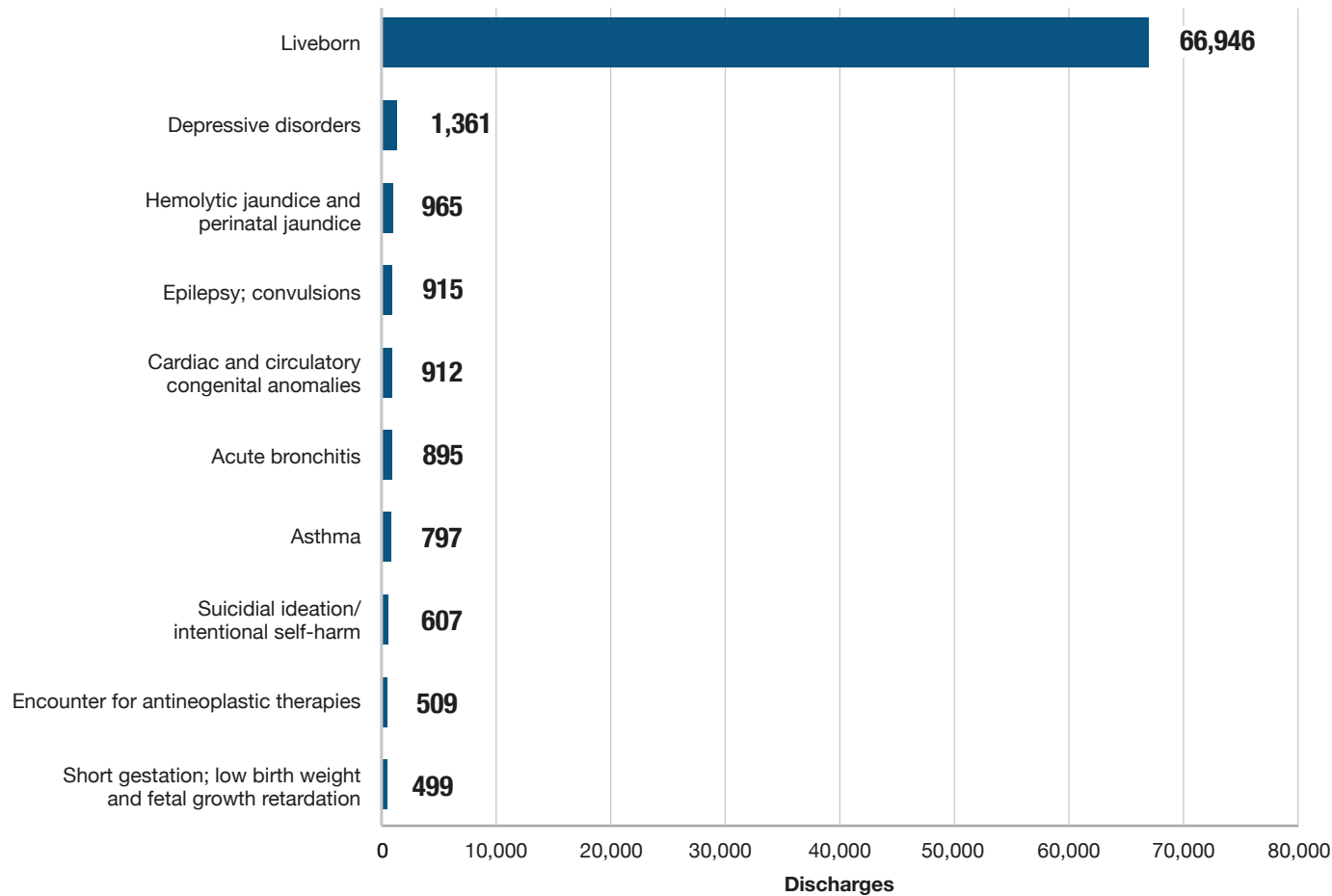
Average Length of Stay by APR-DRG Severity, FFY 2016-2021



Note: The All Patient Refined–Diagnosis Related Groups (APR-DRGs) are a severity and risk-adjusted classification system that provides a means of adjusting for patient differences. All APR-DRGs have 4 severity of illness subclasses calculated mainly on the patient’s provided secondary diagnoses as well as the patient’s age and non-operating room procedures (1=“Minor”, 2=“Moderate”, 3=“Major”, and 4=“Extreme”). The discharge diagnosis classification is based on APR DRG version 34.0. Percentages may not sum to the total due to rounding and because a small number of discharges missing APR-DRG and SOI information were excluded. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

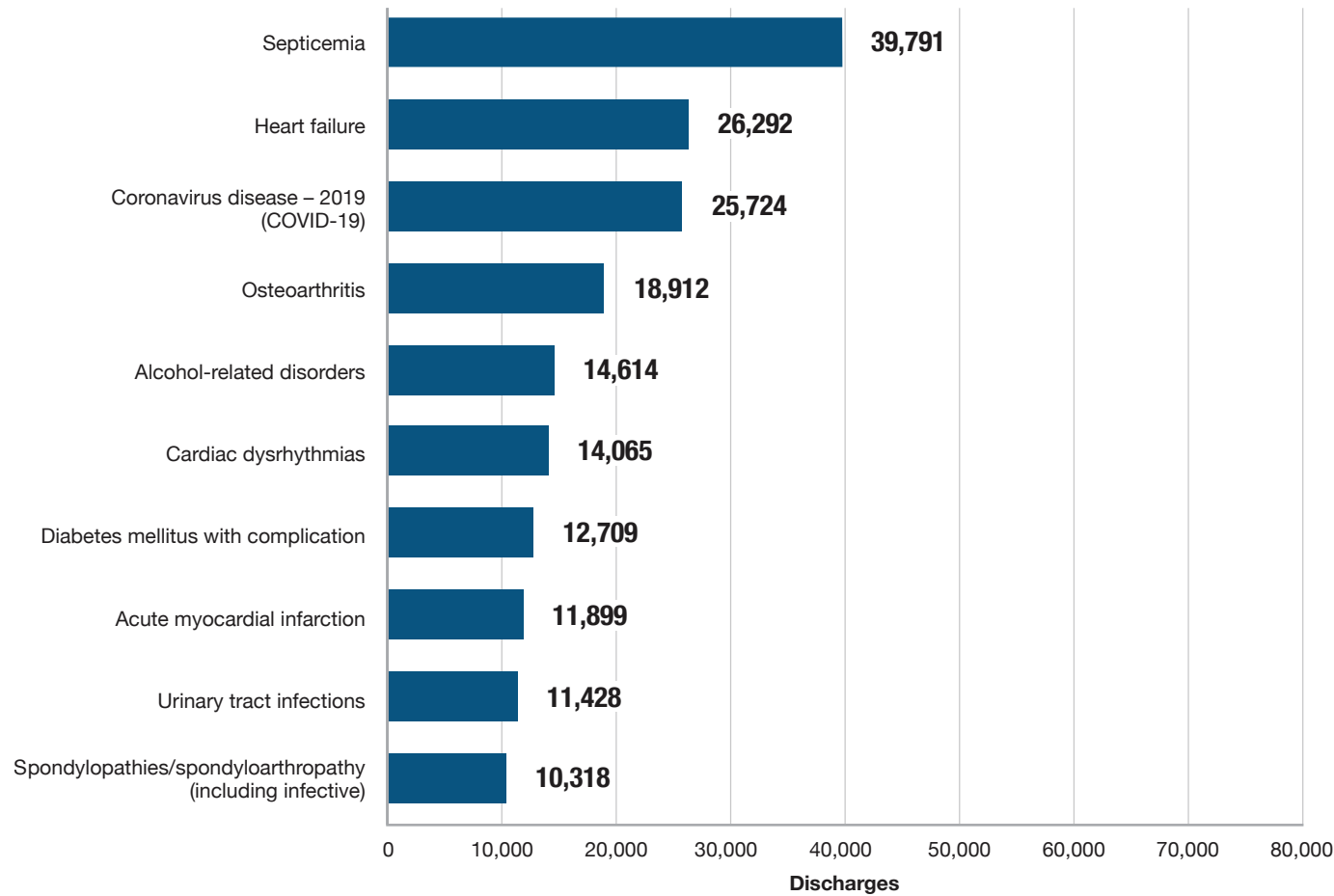
Most Common CCSR Categories for Principal Procedures among Non-Obstetric Pediatric Patients, FFY 2021



Note: Discharges were grouped into one of three groups: any discharge with an obstetric (OB) primary diagnosis, adult (age 18+) without an OB primary diagnosis and pediatric (age 0-17) without an OB primary diagnosis. For this analysis, discharges were categorized into clinically meaningful mutually exclusive categories based on the listed primary diagnosis code using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM diagnoses developed by the Agency for Healthcare Research and Quality (AHRQ). A small number of discharges missing age information were excluded. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

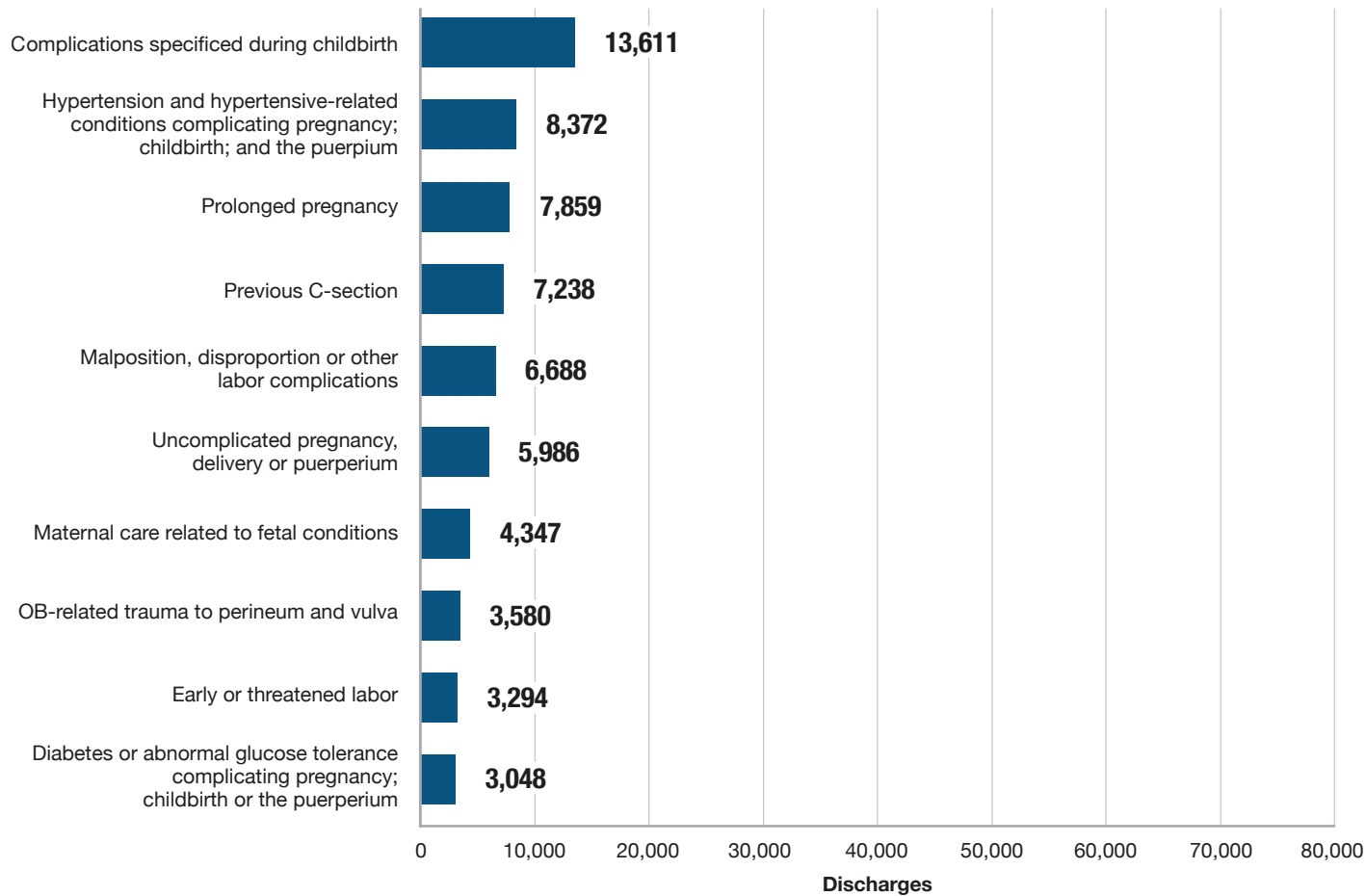
Most Common CCSR Categories for Primary Diagnoses among Non-Obstetric Patients Aged 18+, FFY 2021



Note: Discharges were grouped into one of three groups: any discharge with an obstetric (OB) primary diagnosis, adult (age 18+) without an OB primary diagnosis and pediatric (age 0-17) without an OB primary diagnosis. For this analysis, discharges were categorized into clinically meaningful mutually exclusive categories based on the listed primary diagnosis code using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM diagnoses developed by the Agency for Healthcare Research and Quality (AHRQ). A small number of discharges missing age information were excluded. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

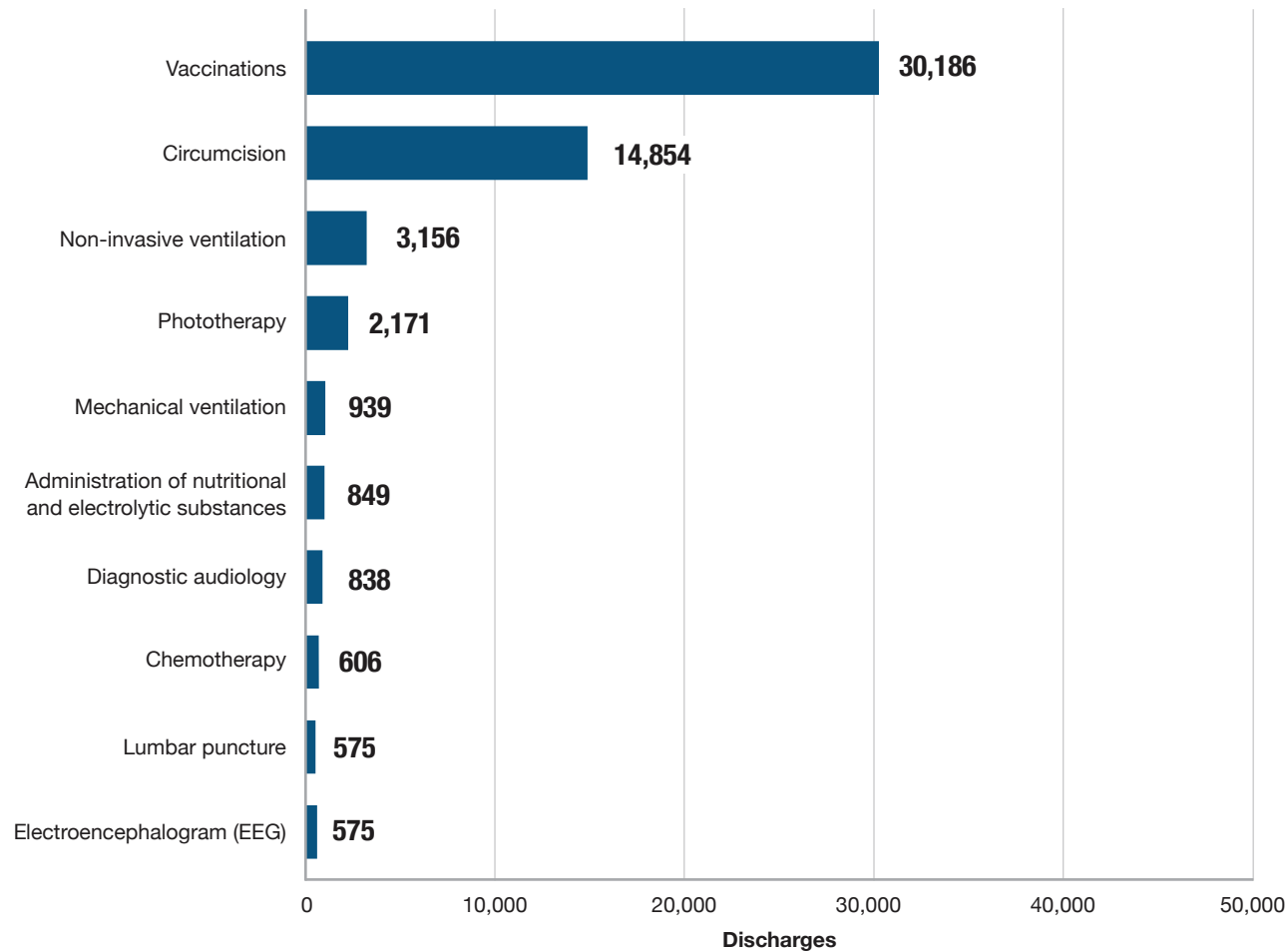
Most Common CCSR Categories for Primary Diagnoses among All Obstetric Patients, FFY 2021



Note: Discharges were grouped into one of three groups: any discharge with an obstetric (OB) primary diagnosis, adult (age 18+) without an OB primary diagnosis and pediatric (age 0-17) without an OB primary diagnosis. For this analysis, discharges were categorized into clinically meaningful mutually exclusive categories based on the listed primary diagnosis code using the Clinical Classifications Software Refined (CCSR) for ICD-10-CM diagnoses developed by the Agency for Healthcare Research and Quality (AHRQ). A small number of discharges missing age information were excluded. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

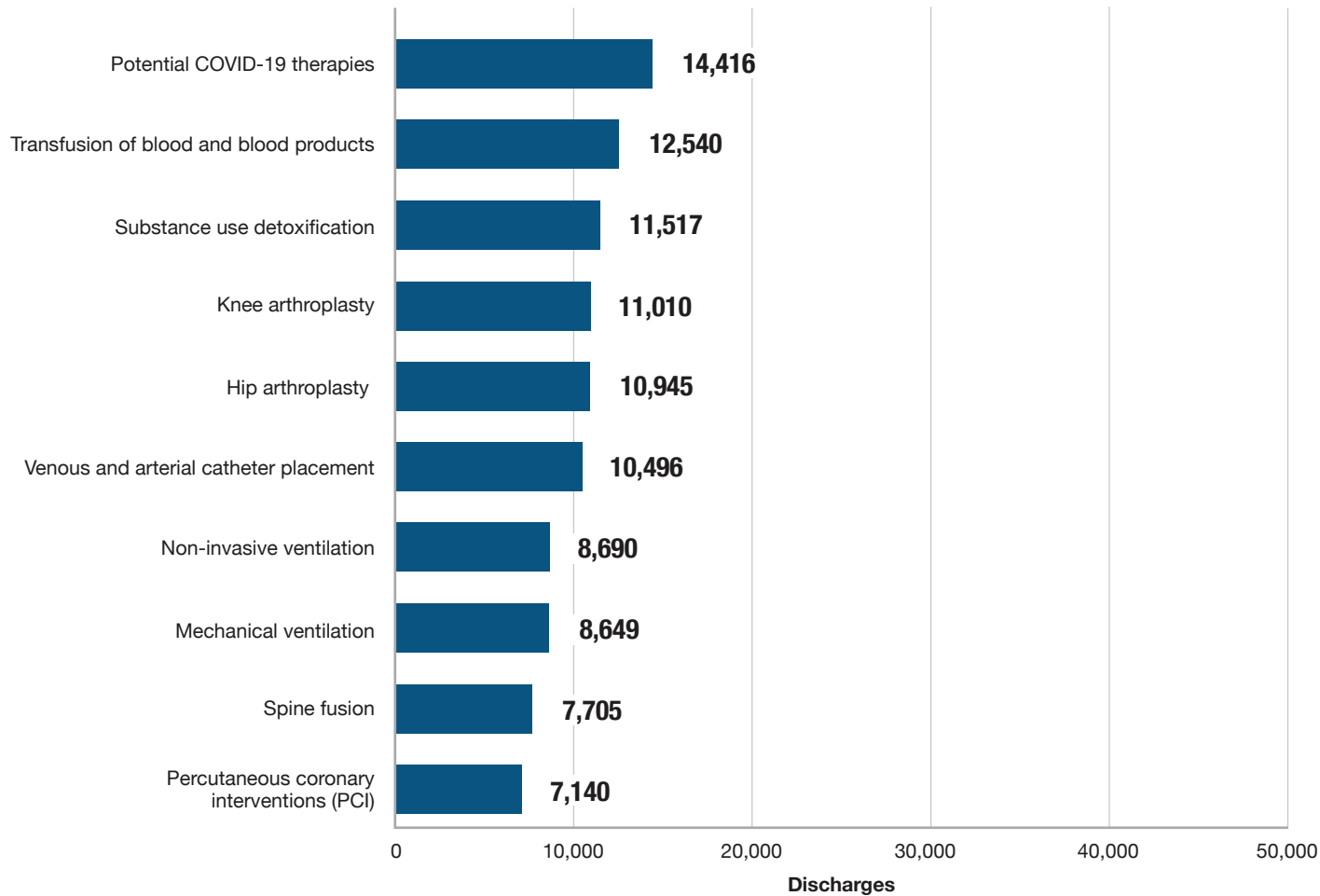
Most Common CCSR Categories for Principal Procedures among Non-Obstetric Pediatric Patients, FFY 2021



Note: Discharges were grouped into one of three groups: any discharge with an obstetric (OB) primary diagnosis, adult (age 18+) without an OB primary diagnosis and pediatric (age 0-17) without an OB primary diagnosis. For this analysis, discharges were categorized into clinically meaningful mutually exclusive categories based on the listed principal procedure code using the Clinical Classifications Software Refined (CCSR) for ICD-10-PCS procedure codes developed by the Agency for Healthcare Research and Quality (AHRQ). This analysis excludes a small number of discharges missing age information. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

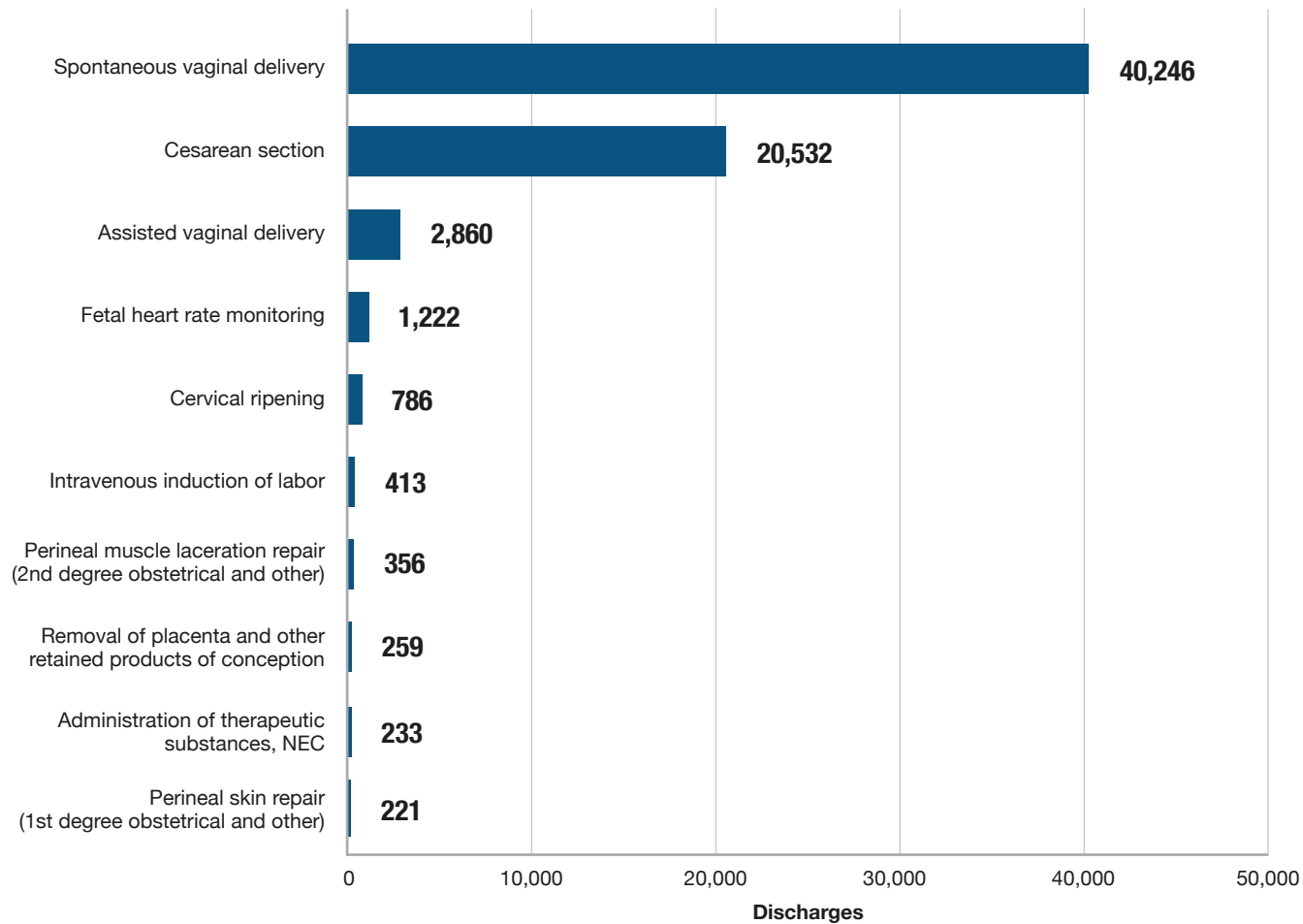
Most Common CCSR Categories for Principal Procedures among Non-Obstetric Patients Aged 18+, FFY 2021



Note: Discharges were grouped into one of three groups: any discharge with an obstetric (OB) primary diagnosis, adult (age 18+) without an OB primary diagnosis and pediatric (age 0-17) without an OB primary diagnosis. For this analysis, discharges were categorized into clinically meaningful mutually exclusive categories based on the listed principal procedure code using the Clinical Classifications Software Refined (CCSR) for ICD-10-PCS procedure codes developed by the Agency for Healthcare Research and Quality (AHRQ). This analysis excludes a small number of discharges missing age information. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

Most Common CCSR Categories for Principal Procedures among All Obstetric Patients, FFY 2021



Note: Discharges were grouped into one of three groups: any discharge with an obstetric (OB) primary diagnosis, adult (age 18+) without an OB primary diagnosis and pediatric (age 0-17) without an OB primary diagnosis. For this analysis, discharges were categorized into clinically meaningful mutually exclusive categories based on the listed principal procedure code using the Clinical Classifications Software Refined (CCSR) for ICD-10-PCS procedure codes developed by the Agency for Healthcare Research and Quality (AHRQ). This analysis excludes a small number of discharges missing age information in FFY 2021. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

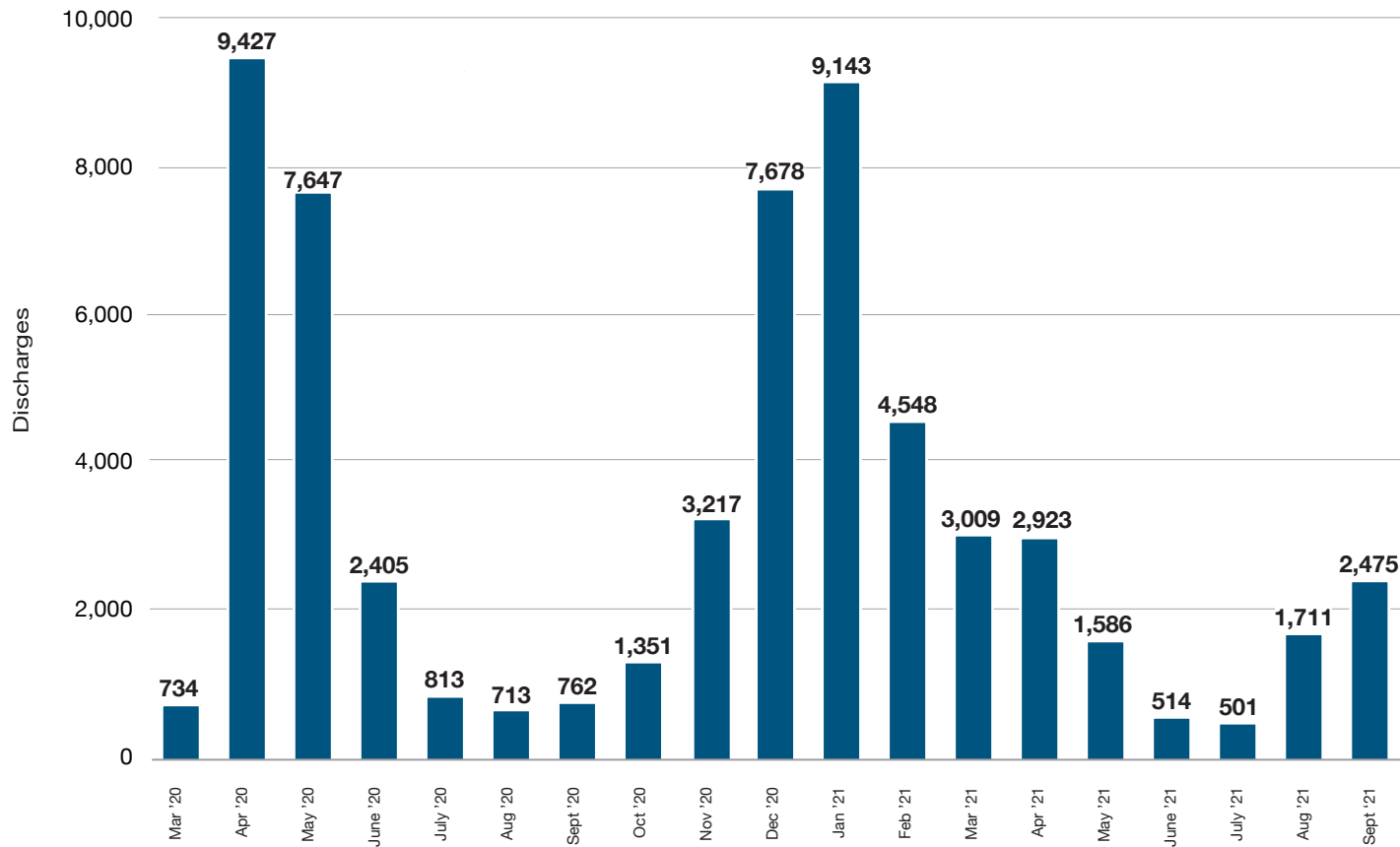
SECTION 5:

COVID-19

This section shows utilization patterns for COVID-19-associated discharges by patient and discharge characteristics, including age group, sex, race/ethnicity, patient region of residence, expected primary payer type, discharge setting, and intensive care use. A discharge was classified as being associated with COVID-19 if it had a primary or secondary ICD-10-CM diagnosis indicating confirmed or suspected COVID-19 and a date of admission on or after April 1, 2020, or a primary or secondary diagnosis of other (not SARS-associated) coronavirus and a date of admission on or before March 31, 2020. Starting January 1, 2021, new ICD-10-CM codes were added related to COVID-19, including J12.82 (Pneumonia due to coronavirus disease 2019).

- Hospitalizations associated with any diagnosis of confirmed or suspected COVID-19 follow the overall trends of positive cases of the virus in Massachusetts, with an initial peak in hospitalizations in April 2020 and a second peak in January 2021.
- Hospitalizations associated with COVID-19 were more common among patients who were aged 65 years and older, Hispanic, or non-white.
- Hospitalizations associated with COVID-19 were most common among patients who resided in the Metro South region.
- COVID-19 hospitalizations were also associated with higher in-hospital mortality, including 19% of all hospitalizations associated with COVID-19 in April 2020.
- COVID-19 hospitalizations were associated with higher proportions of intensive care use compared to those without COVID-19. ■

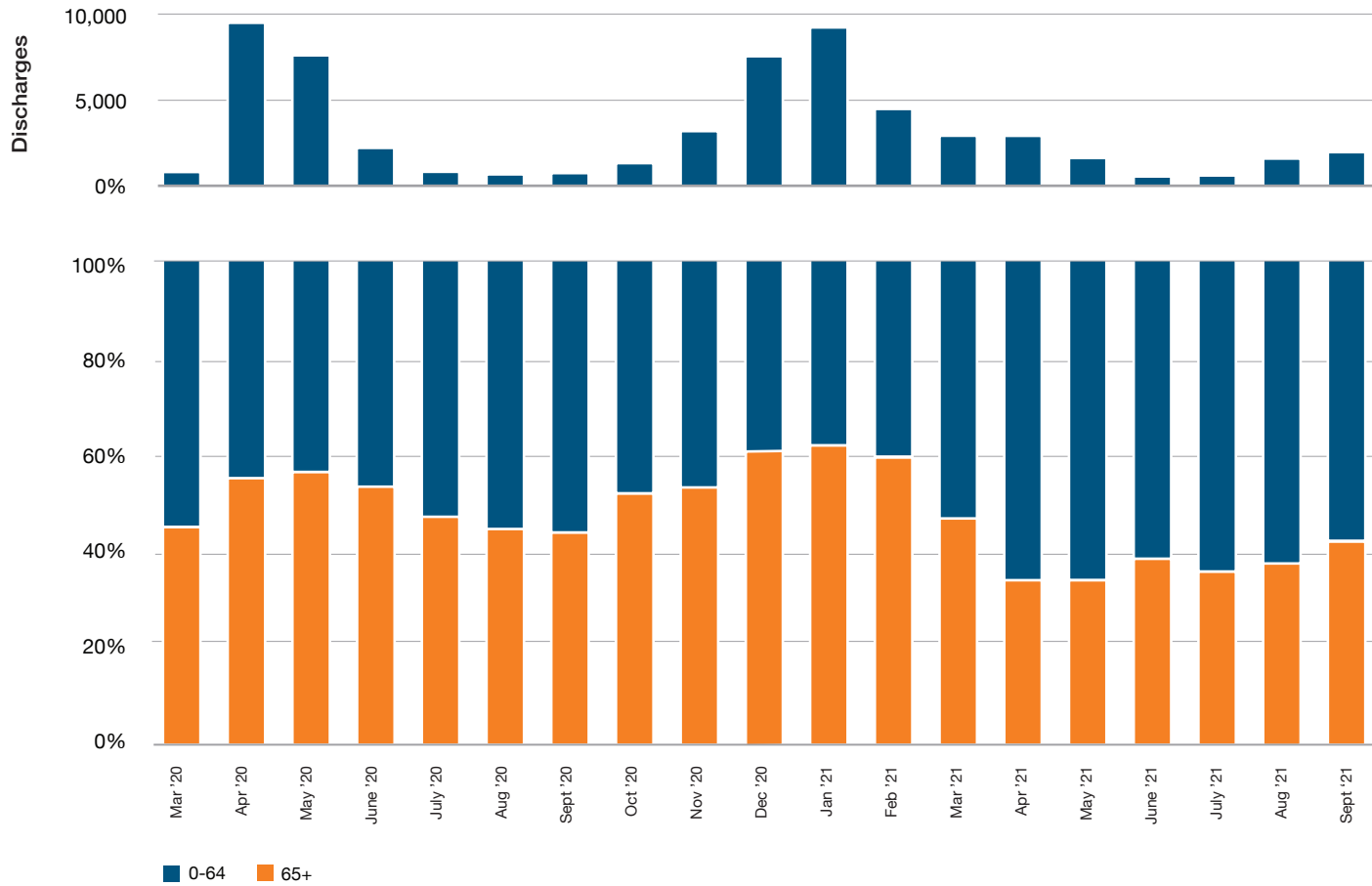
Inpatient Discharges Associated with COVID-19, March 2020-September 2021



Note: A discharge was classified as being associated with COVID-19 if it had a primary or secondary ICD-10-CM diagnosis indicating confirmed or suspected COVID-19. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2020-2021

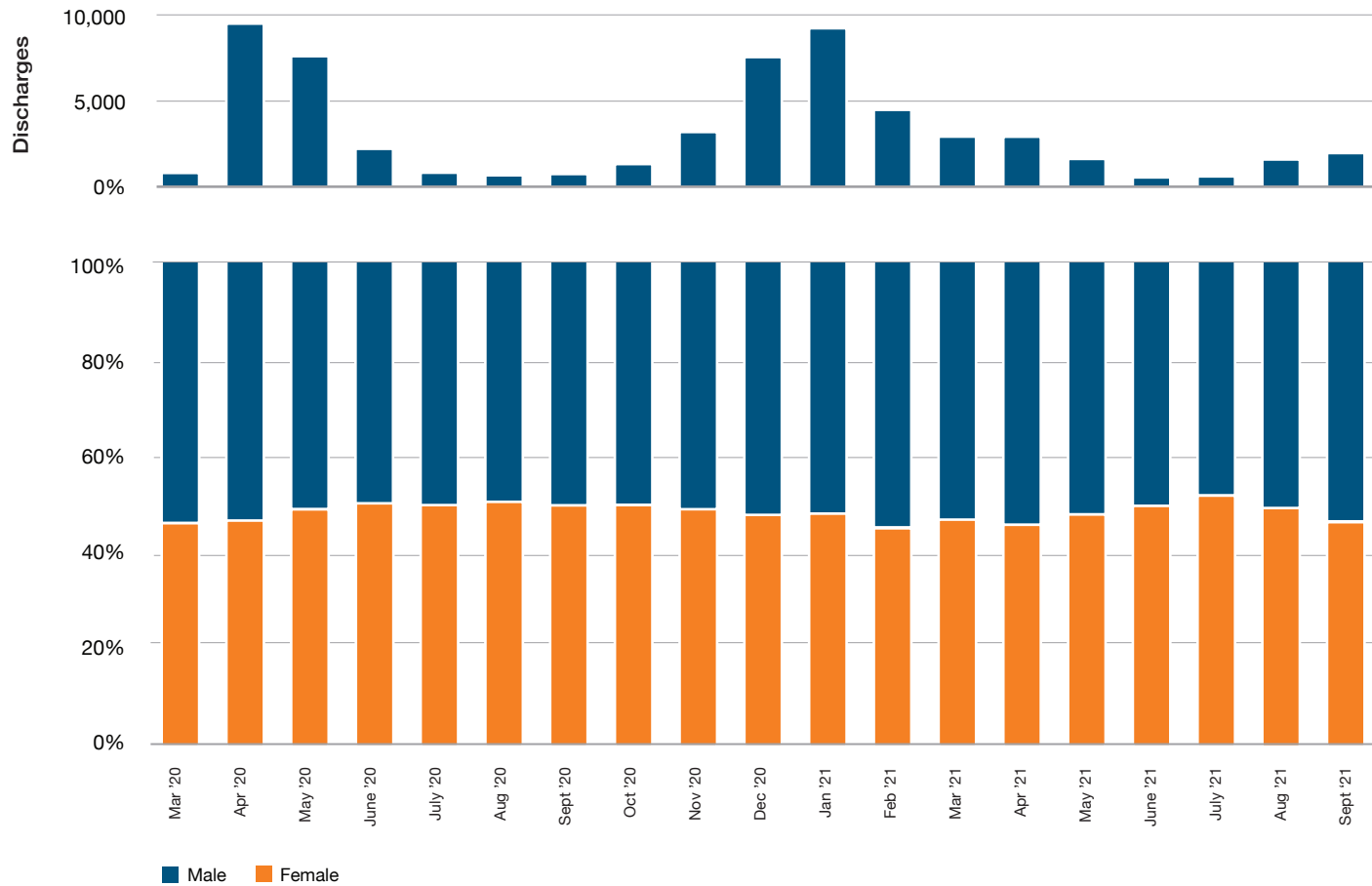
Inpatient Discharges Associated with COVID-19 by Age Group, March 2020-September 2021



Note: A discharge was classified as being associated with COVID-19 if it had a primary or secondary ICD-10-CM diagnosis indicating confirmed or suspected COVID-19. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2020-2021

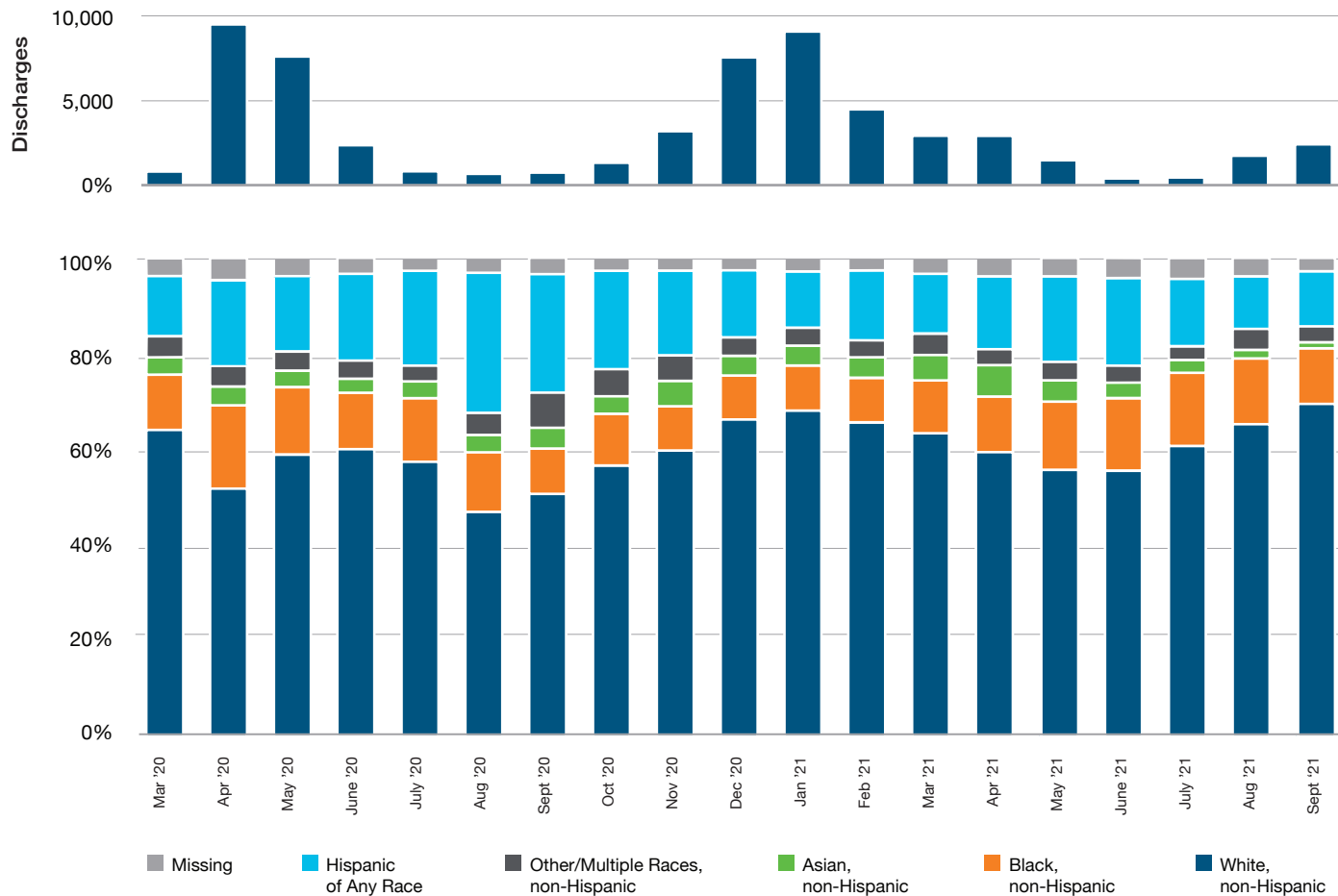
Inpatient Discharges Associated with COVID-19 by Sex, March 2020-September 2021



Note: A discharge was classified as being associated with COVID-19 if it had a primary or secondary ICD-10-CM diagnosis indicating confirmed or suspected COVID-19. This analysis excludes two discharges with Unknown sex from March 2020 to September 2021. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2020-2021

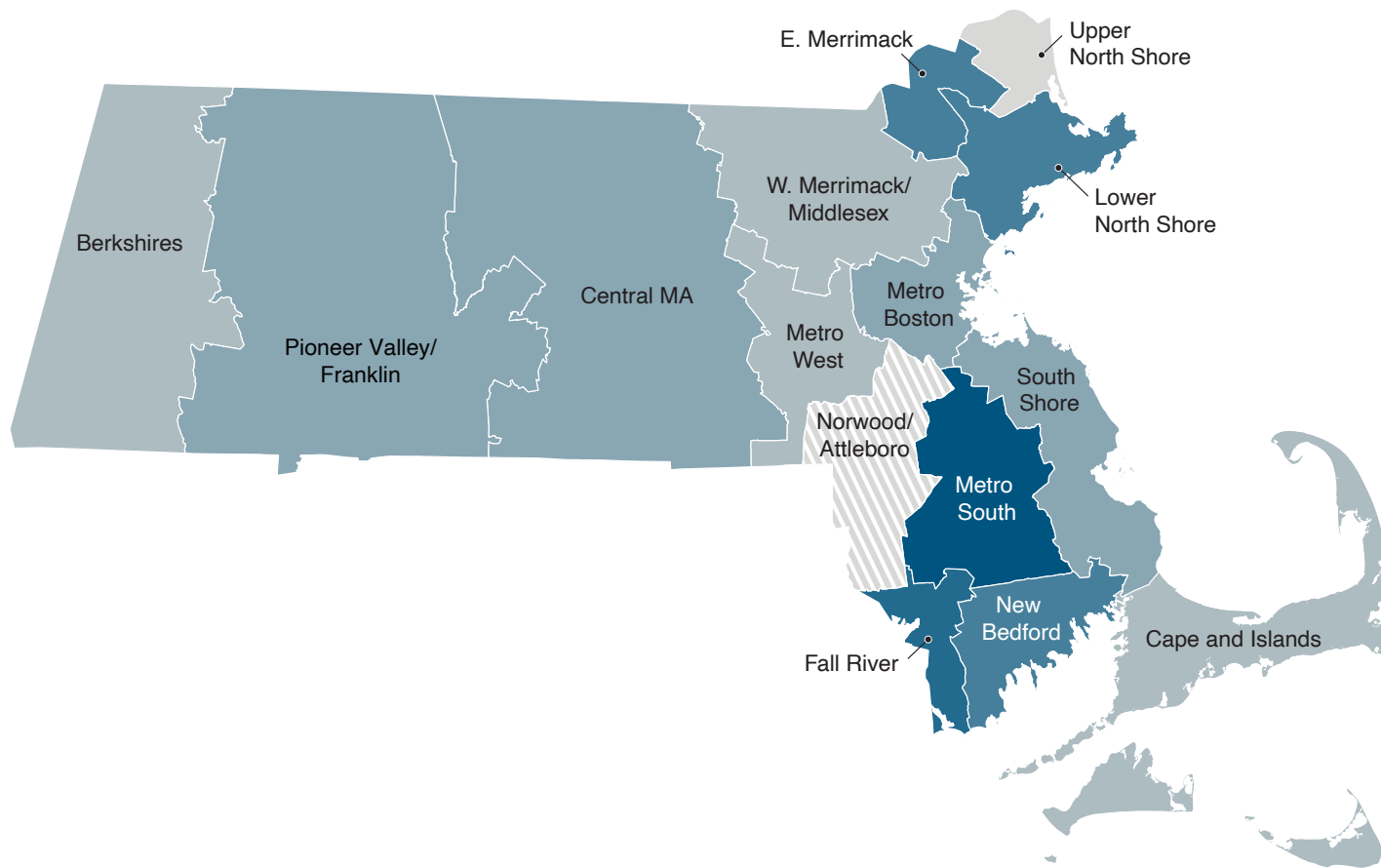
Inpatient Discharges Associated with COVID-19 by Race/Ethnicity, March 2020-September 2021



Note: A discharge was classified as being associated with COVID-19 if it had a primary or secondary ICD-10-CM diagnosis indicating confirmed or suspected COVID-19. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. For more information and more detailed race/ethnicity categories, see [technical appendix](#).

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2020-2021

Inpatient Discharges Associated with COVID-19 by Patient Region of Residence, March 2020-September 2021



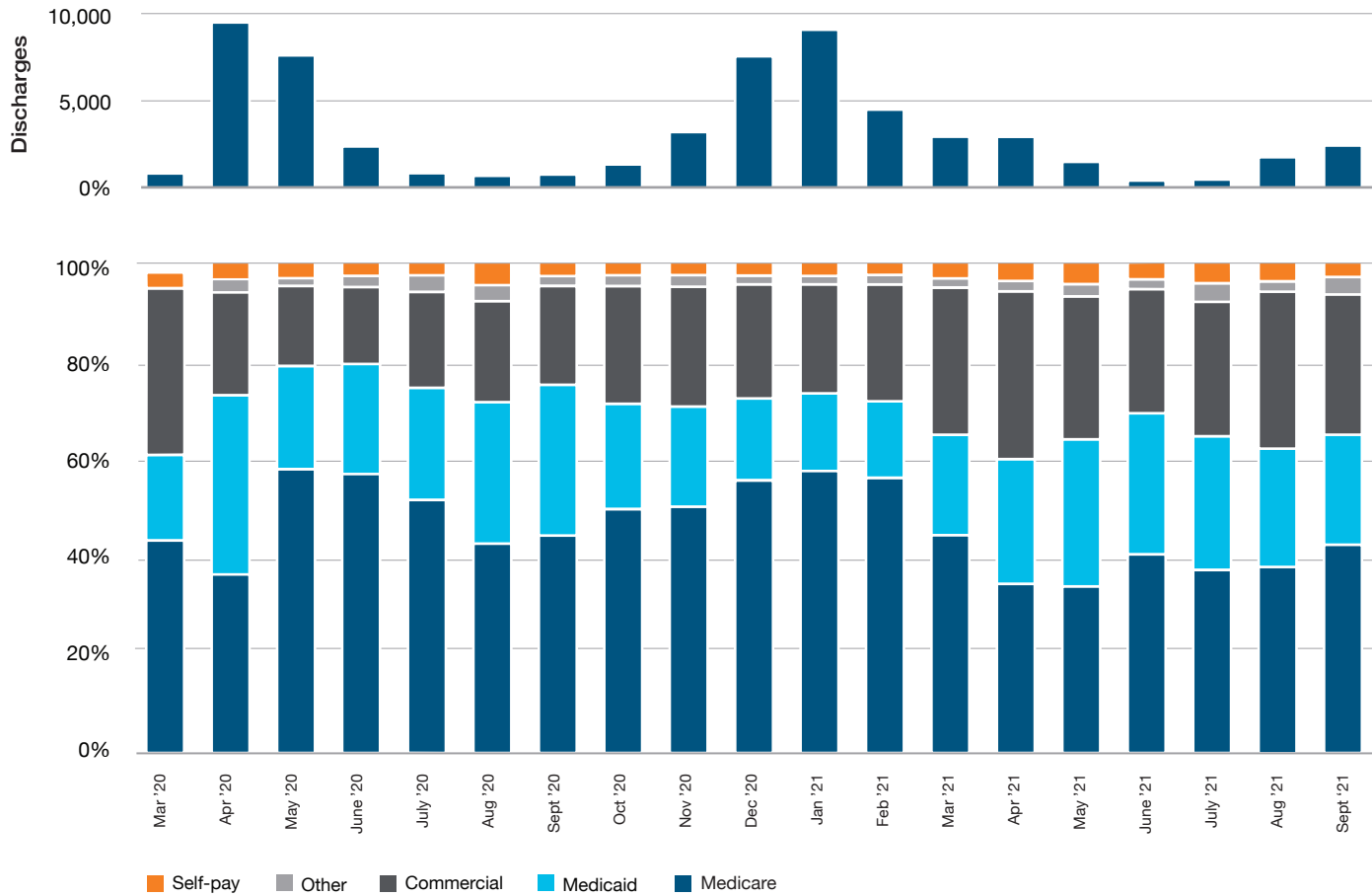
Discharges per 100,000 persons

- <1,000
- 1,000–1,249
- 1,250–1,499
- 1,500–1,7499
- 1,750–1,999
- >=2,000
- Incomplete data

Note: A discharge was classified as being associated with COVID-19 if it had a primary or secondary ICD-10-CM diagnosis indicating confirmed or suspected COVID-19. Discharges for patients with a permanent address in Massachusetts were assigned by ZIP code to one of 15 regions defined by the Health Policy Commission (HPC). 3,430 COVID-related discharges from March 2020 to September 2021 with a permanent patient address outside Massachusetts or with unknown address location were excluded. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. As this hospital made up about one in four discharges in the Norwood/Attleboro region, the data for this region have been suppressed. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2020-2021

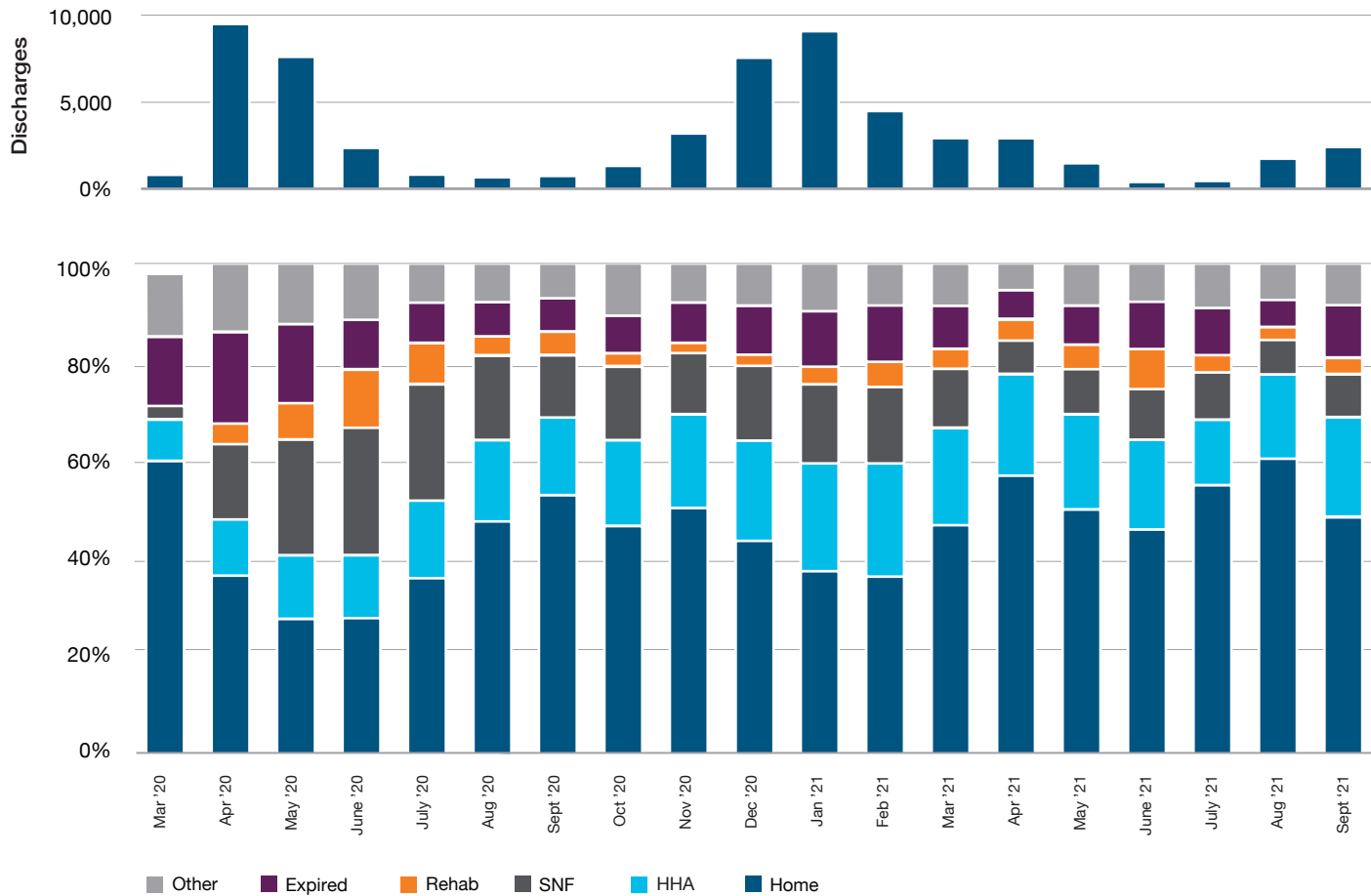
Inpatient Discharges Associated with COVID-19 by Expected Primary Payer Type, March 2020-September 2021



Note: A discharge was classified as being associated with COVID-19 if it had a primary or secondary ICD-10-CM diagnosis indicating confirmed or suspected COVID-19. Analysis includes information on expected primary payer type as provided by the hospital and does not include information on secondary or supplemental payer information. Other insurance includes Worker's Compensation, Other Government Payment, Auto Insurance, and Dental Plans. This analysis excludes a small number of discharges between March 2020 and September 2021 missing expected primary payer type information. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2020-2021

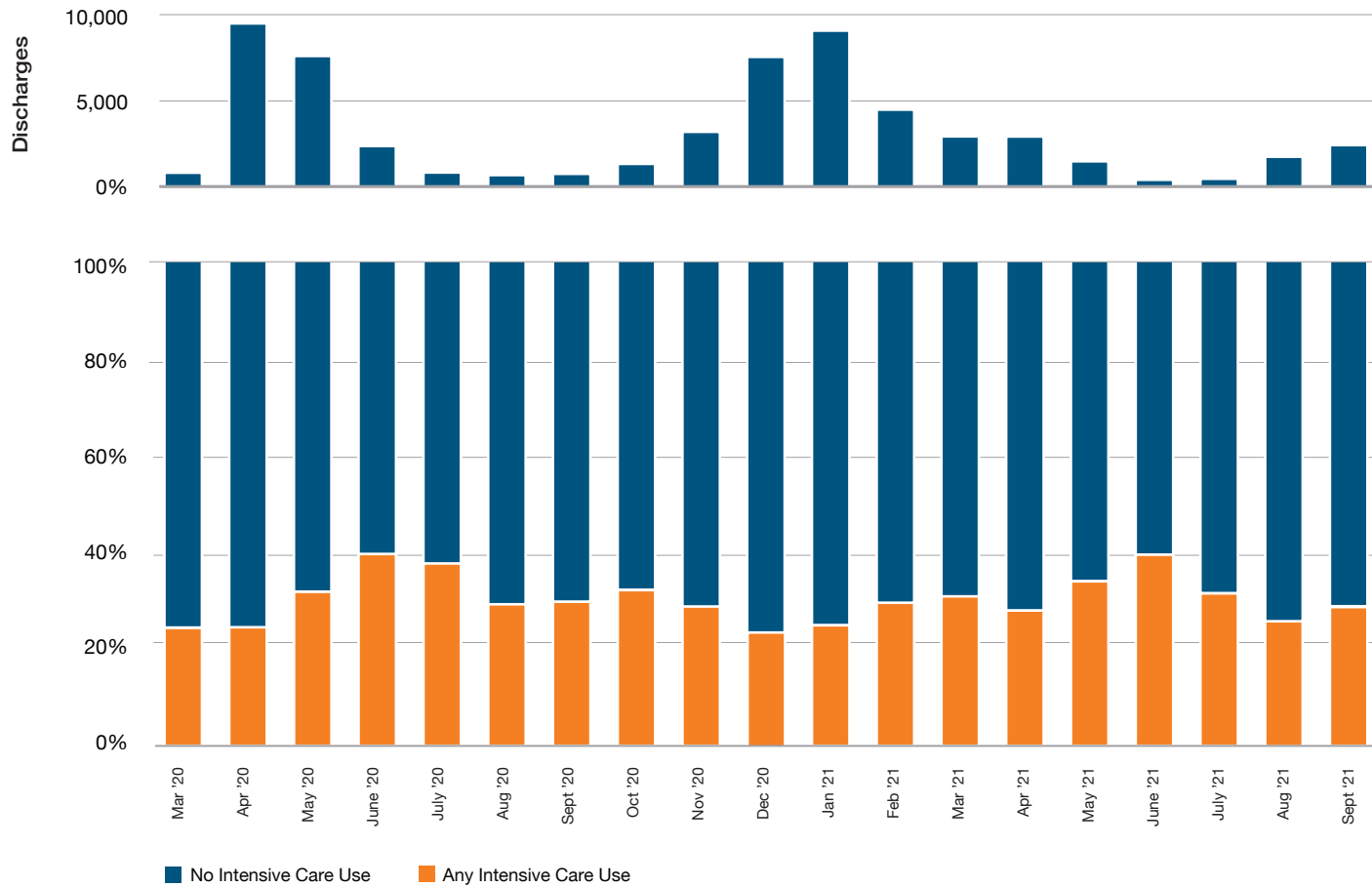
Inpatient Discharges Associated with COVID-19 by Discharge Setting, March 2020-September 2021



Note: A discharge was classified as being associated with COVID-19 if it had a primary or secondary ICD-10-CM diagnosis indicating confirmed or suspected COVID-19. Discharge setting was classified into one of five categories: Home, Home with Home Health Agency (HHA), Skilled Nursing Facility (SNF), Rehabilitation (or Rehab), Hospice, Expired, and Other. This analysis excludes a small number of discharges between March 2020 and September 2021 missing discharge setting information. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2020-2021

Inpatient Discharges Associated with COVID-19 by Intensive Care Use, March 2020-September 2021



Note: A discharge was classified as being associated with COVID-19 if it had a primary or secondary ICD-10-CM diagnosis indicating confirmed or suspected COVID-19. A discharge was characterized as having intensive care use if the discharge had any non-zero charge for revenue codes associated with intensive care services. These include stays in the Intensive Care Unit (ICU), Coronary Care Unit (CCU), Neonatal Intensive Care Unit (NICU), Pediatric Intensive Care Unit (PICU), and other intensive care use. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2020-2021

SECTION 6:

Behavioral Health

This section presents analyses of inpatient discharges associated with behavioral health conditions, which include mental health conditions and substance use disorders. Only inpatient discharges for patients aged two years or older were included in the analyses for this section.

Discharges were categorized into clinical meaningful independent behavioral health categories based on the listed primary and secondary ICD-10-CM diagnosis codes using all CCSR categories defined by AHRQ as related to behavioral health. A discharge may be associated with more than one behavioral health category because all primary and secondary diagnoses on the discharge record were considered and because ICD-10-CM diagnoses may be associated with more than one CCSR category. For some analyses in this section, inpatient discharges were classified as either only being associated with mental health conditions, only being associated with substance

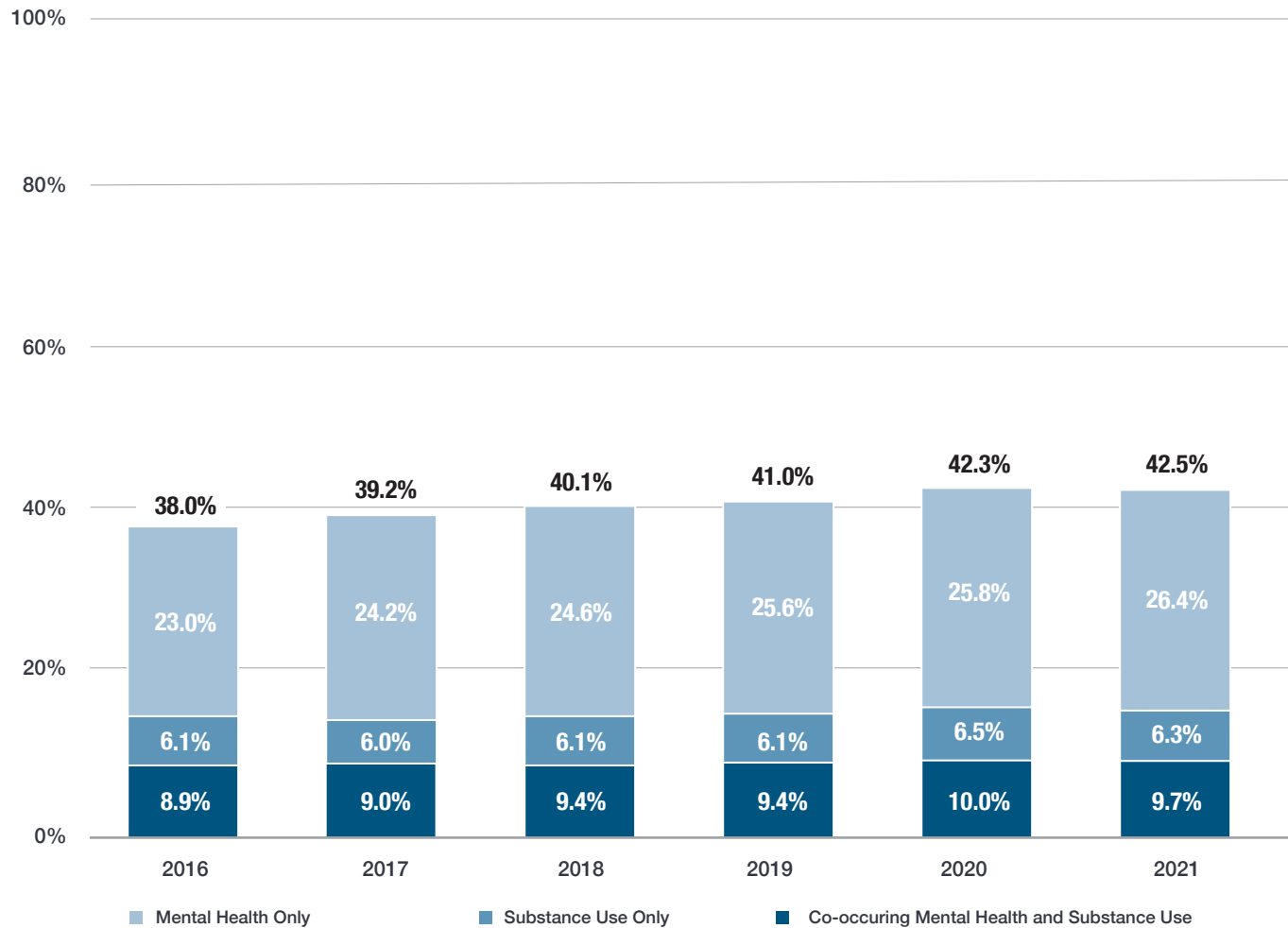
use disorders, or being associated with both a mental health and substance use disorder. For more information, please see the [technical appendix](#). Unless noted, key findings refer to data year 2021.

- The prevalence of behavioral health conditions among inpatient discharges increased steadily over the six-year period from 38.0% in 2016 to 42.5% in 2021.
- Over one in three (36.1%) hospitalizations were associated with a mental health condition and one in six (16.0%) with a substance use disorder. This includes 9.7% with co-occurring mental health and substance use conditions.
- The most common mental health conditions were mood and anxiety disorders (20.8% and 19.7%, respectively). The most common substance use disorders were for alcohol (8.5%) and opioids (4.7%).

- Over half of discharges for patients aged 45-64 had an associated behavioral health condition (54.6%).
- Discharges among female patients had a higher prevalence of associated mental health conditions, whereas discharges among male patients had a higher prevalence of associated substance use disorders.

- Over half (53.0%) of discharges with an expected primary payer type of Medicaid were associated with a behavioral health condition.
- Patients with a primary residence in the Berkshires region had the highest share of inpatient discharges associated with a behavioral health condition, closely followed by the Lower North Shore and Fall River regions. ■

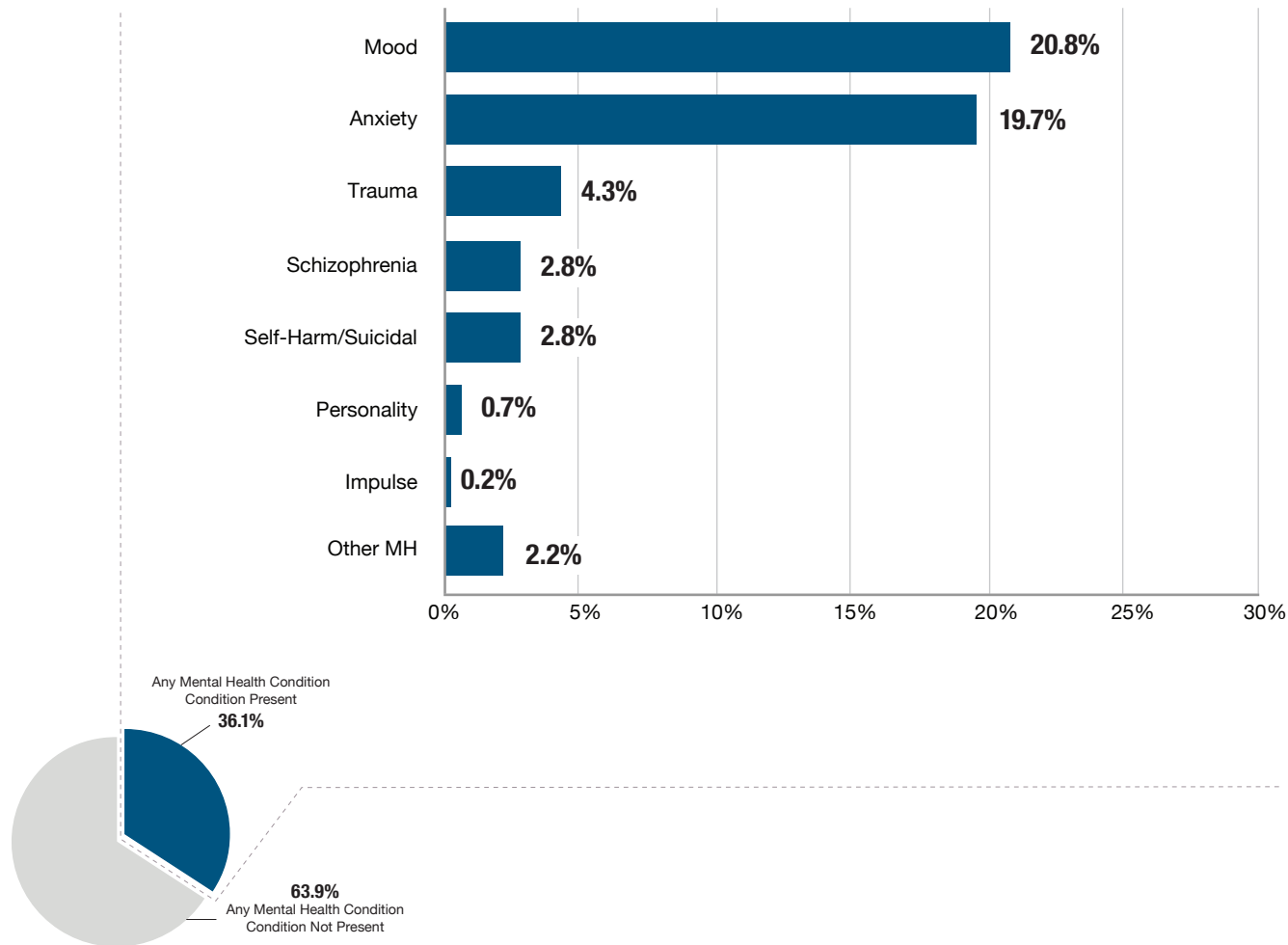
Inpatient Discharges Associated with Behavioral Health Conditions, FFY 2016-2021



Note: For this analysis, discharges were categorized into clinically meaningful independent behavioral health categories based on the listed primary and secondary diagnosis codes using the CCSR categories for ICD-10-CM diagnoses as related to behavioral health. A discharge may be associated with more than one behavioral health category because all primary and secondary diagnoses on the discharge record were considered and because ICD-10-CM diagnoses may be associated with more than one CCSR category. Discharges were classified into mutually exclusive groups: one or more mental health conditions associated with the discharge, but no substance use disorder, one or more substance use disorders associated with the discharge but no mental health condition, and co-occurring mental health and substance use conditions. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information and detailed behavioral health category definitions.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2016-2021

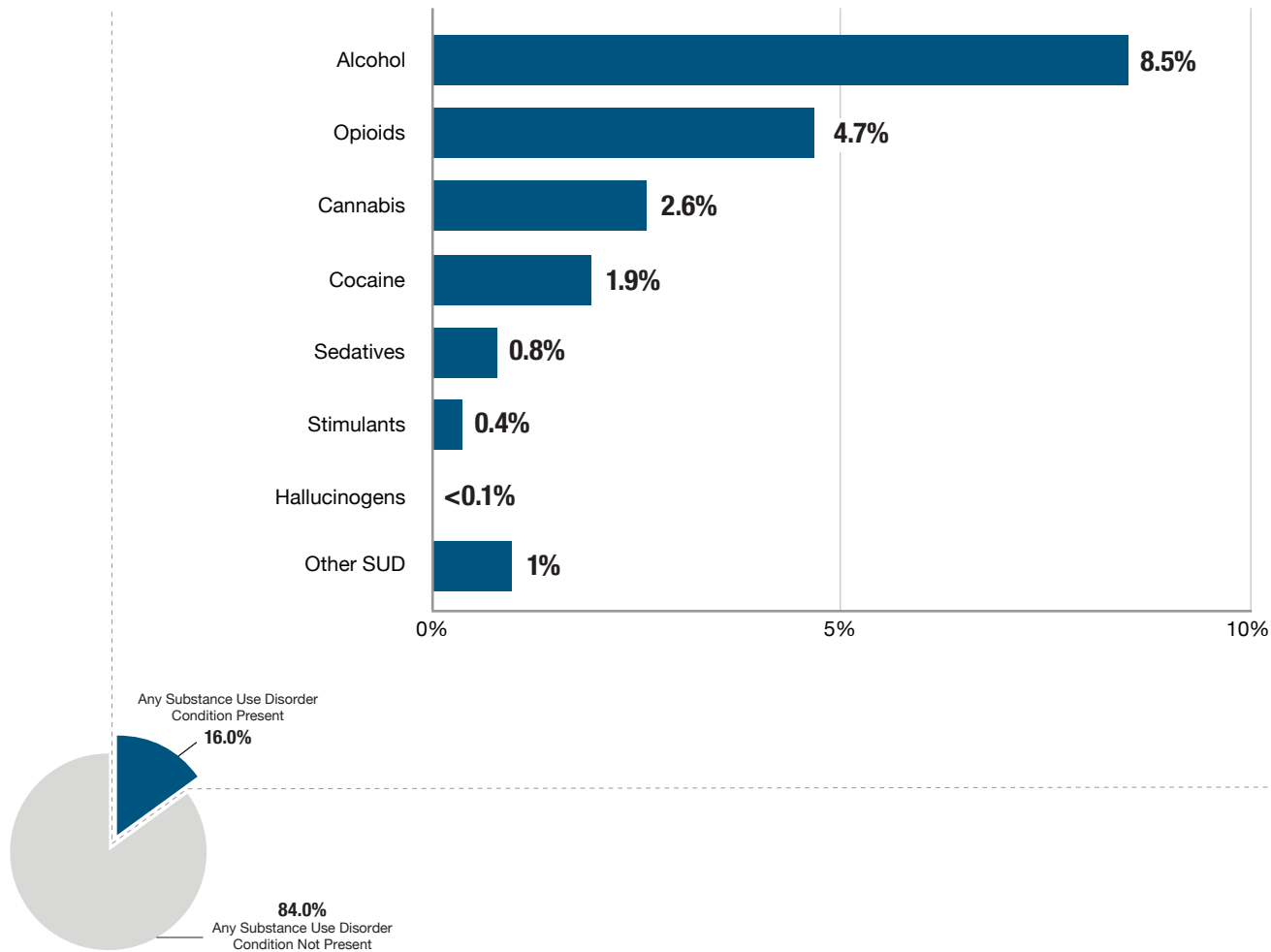
Mental Health Conditions among Inpatient Discharges, FFY 2021



Note: For this analysis, discharges were categorized into clinically meaningful independent behavioral health categories based on the listed primary and secondary diagnosis codes using the CCSR categories for ICD-10-CM diagnoses as related to behavioral health. A discharge may be associated with more than one behavioral health category because all primary and secondary diagnoses on the discharge record were considered and because ICD-10-CM diagnoses may be associated with more than one CCSR category. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information and detailed behavioral health category definitions.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

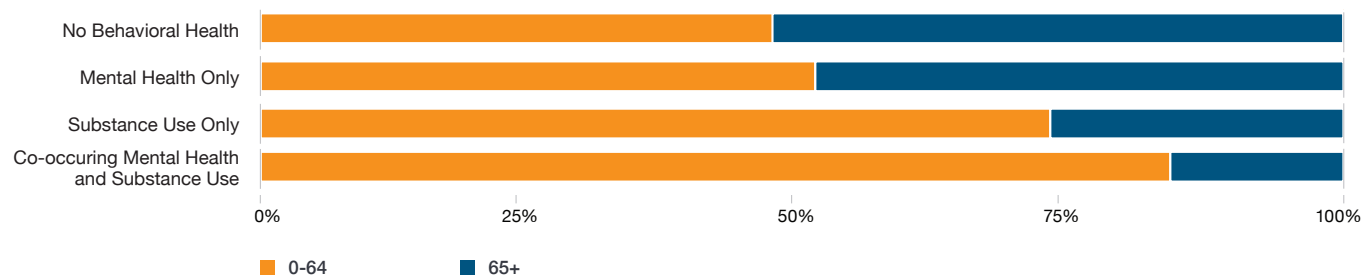
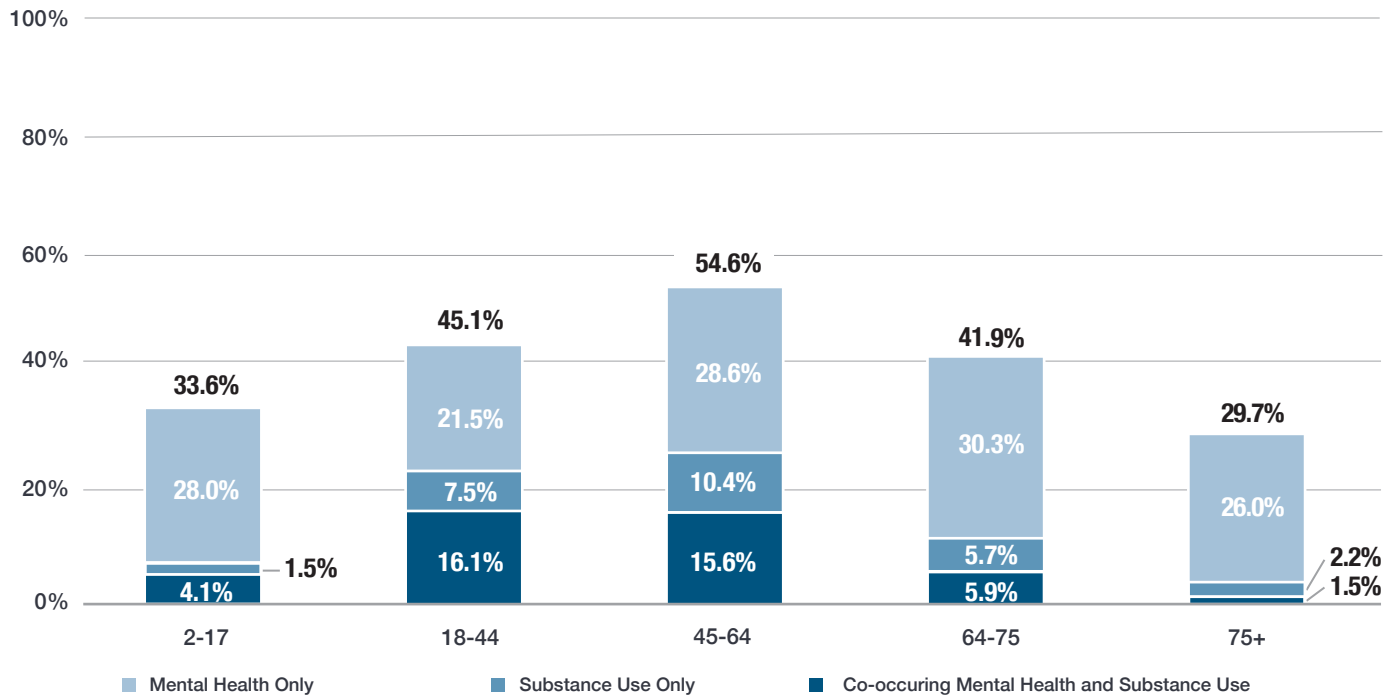
Substance Use Disorders among Inpatient Discharges, FFY 2021



Note: For this analysis, discharges were categorized into clinically meaningful independent behavioral health categories based on the listed primary and secondary diagnosis codes using the CCSR categories for ICD-10-CM diagnoses as related to behavioral health. A discharge may be associated with more than one behavioral health category because all primary and secondary diagnoses on the discharge record were considered and because ICD-10-CM diagnoses may be associated with more than one CCSR category. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information and detailed behavioral health category definitions.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

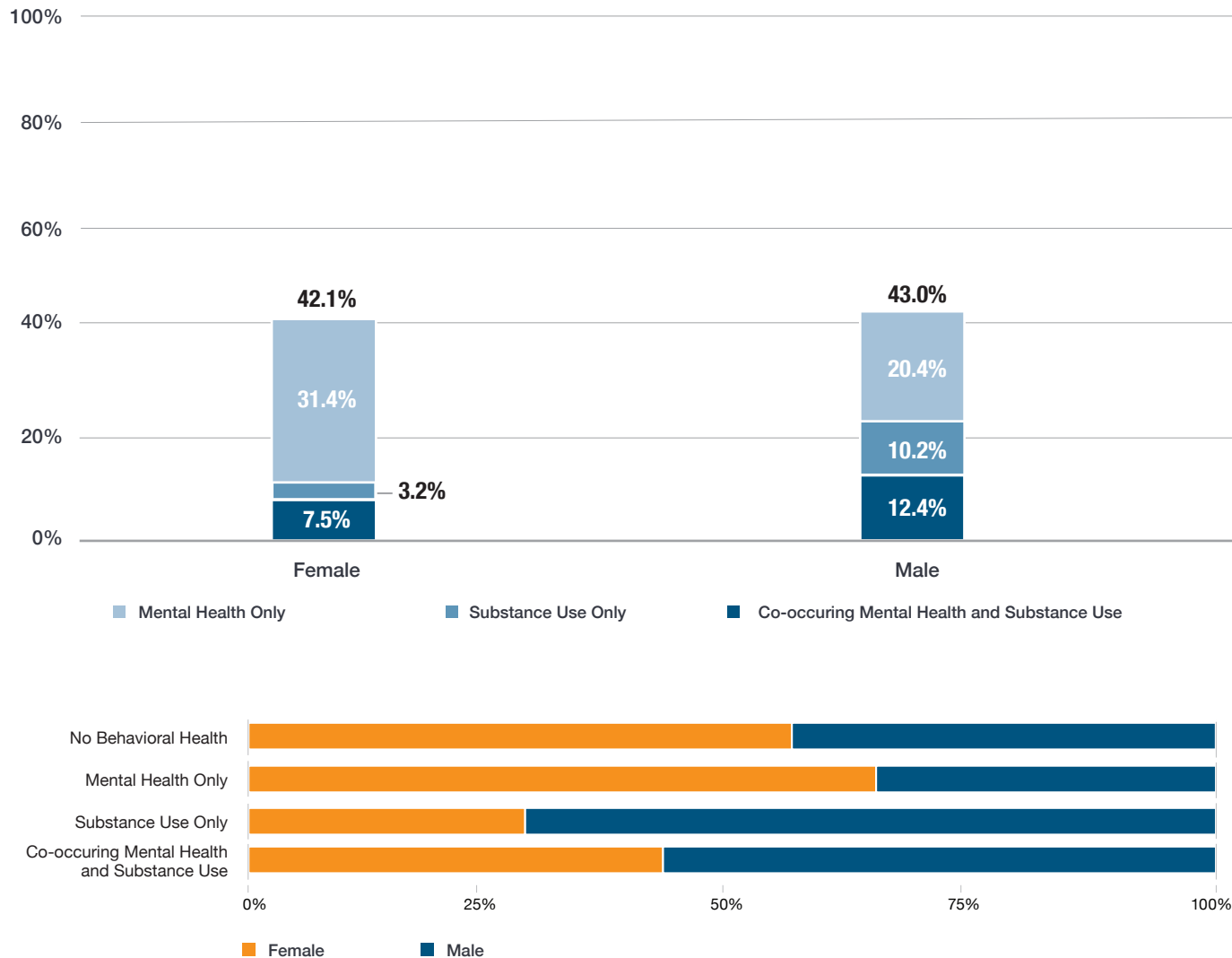
Inpatient Discharges Associated with Behavioral Health Conditions by Age Group, FFY 2021



Note: For this analysis, discharges were categorized into clinically meaningful independent behavioral health categories based on the listed primary and secondary diagnosis codes using the CCSR categories for ICD-10-CM diagnoses as related to behavioral health. A discharge may be associated with more than one behavioral health category because all primary and secondary diagnoses on the discharge record were considered and because ICD-10-CM diagnoses may be associated with more than one CCSR category. Discharges were classified into mutually exclusive groups: one or more mental health conditions associated with the discharge, but no substance use disorder, one or more substance use disorders associated with the discharge but no mental health condition, and co-occurring mental health and substance use conditions. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information and detailed behavioral health category definitions.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

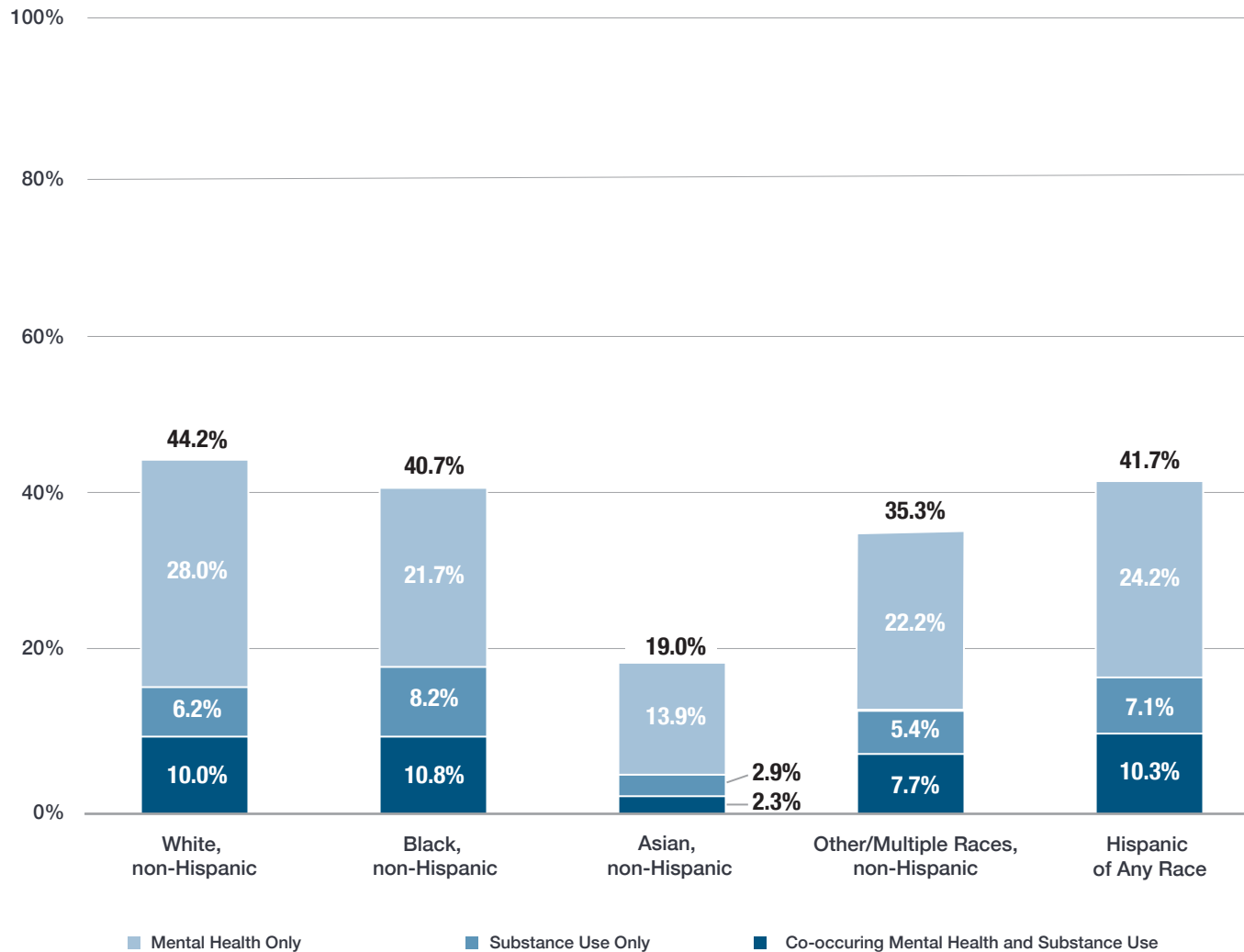
Inpatient Discharges Associated with Behavioral Health Conditions by Sex, FFY 2021



Note: For this analysis, discharges were categorized into clinically meaningful independent behavioral health categories based on the listed primary and secondary diagnosis codes using the CCSR categories for ICD-10-CM diagnoses as related to behavioral health. A discharge may be associated with more than one behavioral health category because all primary and secondary diagnoses on the discharge record were considered and because ICD-10-CM diagnoses may be associated with more than one CCSR category. Discharges were classified into mutually exclusive groups: one or more mental health conditions associated with the discharge, but no substance use disorder, one or more substance use disorders associated with the discharge but no mental health condition, and co-occurring mental health and substance use conditions. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information and detailed behavioral health category definitions.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

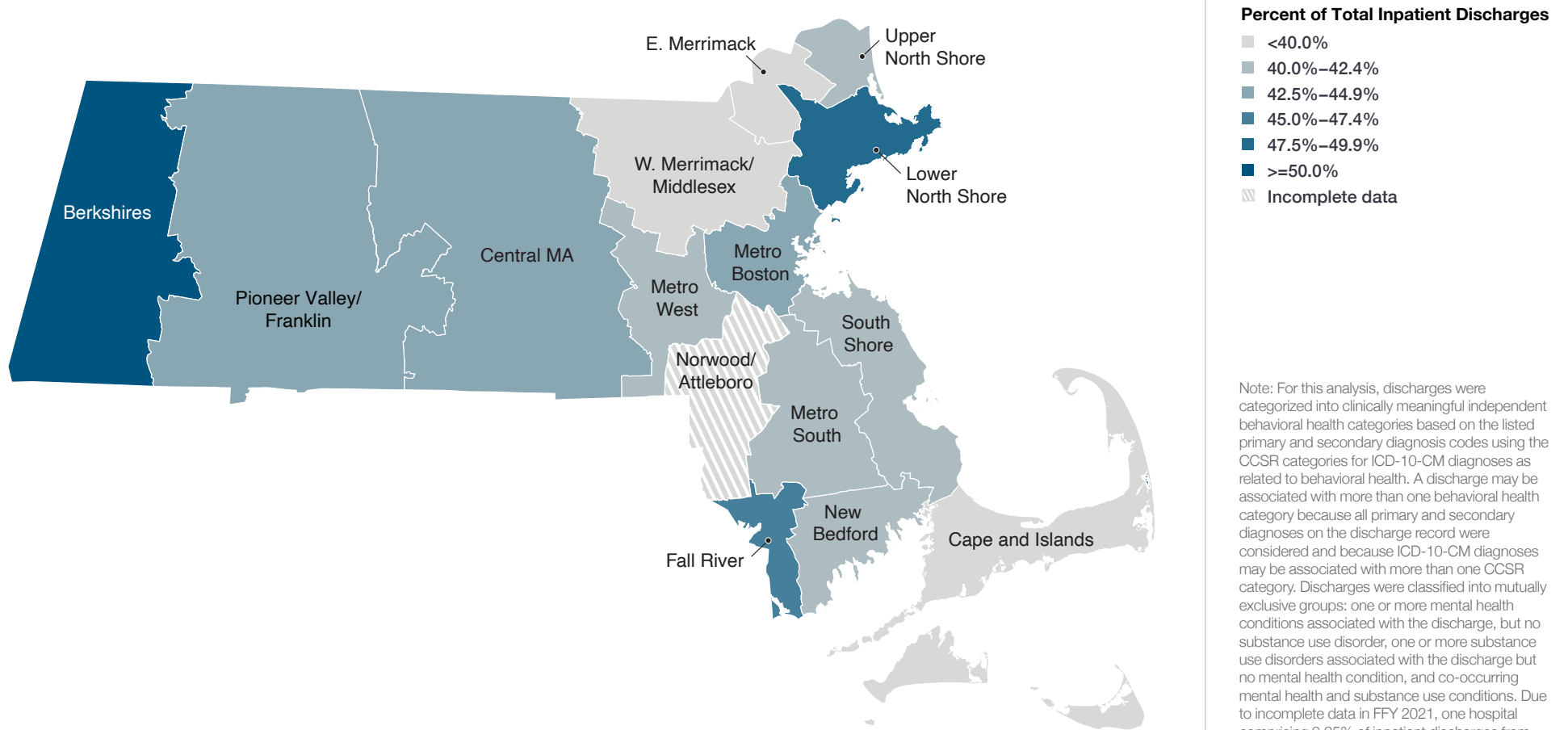
Inpatient Discharges Associated with Behavioral Health Conditions by Race/Ethnicity, FFY 2021



Note: For this analysis, discharges were categorized into clinically meaningful independent behavioral health categories based on the listed primary and secondary diagnosis codes using the CCSR categories for ICD-10-CM diagnoses as related to behavioral health. A discharge may be associated with more than one behavioral health category because all primary and secondary diagnoses on the discharge record were considered and because ICD-10-CM diagnoses may be associated with more than one CCSR category. Discharges were classified into mutually exclusive groups: one or more mental health conditions associated with the discharge, but no substance use disorder, one or more substance use disorders associated with the discharge but no mental health condition, and co-occurring mental health and substance use conditions. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information and more detailed behavioral health and race/ethnicity category definitions.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

Inpatient Discharges Associated with any Behavioral Health Condition by Patient Region of Residence, FFY 2021



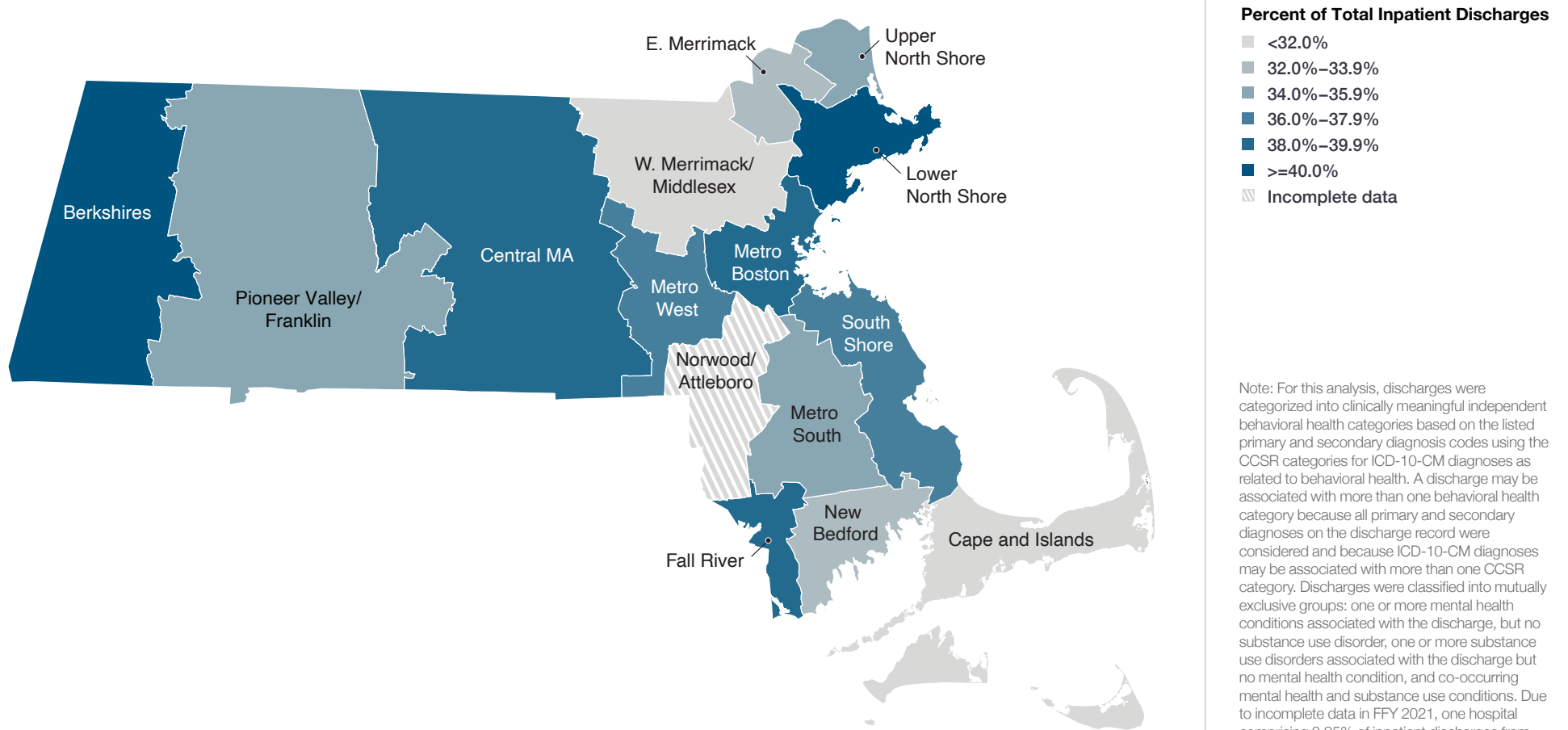
Percent of Total Inpatient Discharges

- <40.0%
- 40.0%–42.4%
- 42.5%–44.9%
- 45.0%–47.4%
- 47.5%–49.9%
- >=50.0%
- ▨ Incomplete data

Note: For this analysis, discharges were categorized into clinically meaningful independent behavioral health categories based on the listed primary and secondary diagnosis codes using the CCSR categories for ICD-10-CM diagnoses as related to behavioral health. A discharge may be associated with more than one behavioral health category because all primary and secondary diagnoses on the discharge record were considered and because ICD-10-CM diagnoses may be associated with more than one CCSR category. Discharges were classified into mutually exclusive groups: one or more mental health conditions associated with the discharge, but no substance use disorder, one or more substance use disorders associated with the discharge but no mental health condition, and co-occurring mental health and substance use conditions. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. As this hospital made up about one in four discharges in the Norwood/Attleboro region the data for this region has been suppressed. See [technical appendix](#) for more information and detailed behavioral health category definitions.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

Inpatient Discharges Associated with any Mental Health Condition by Patient Region of Residence, FFY 2021



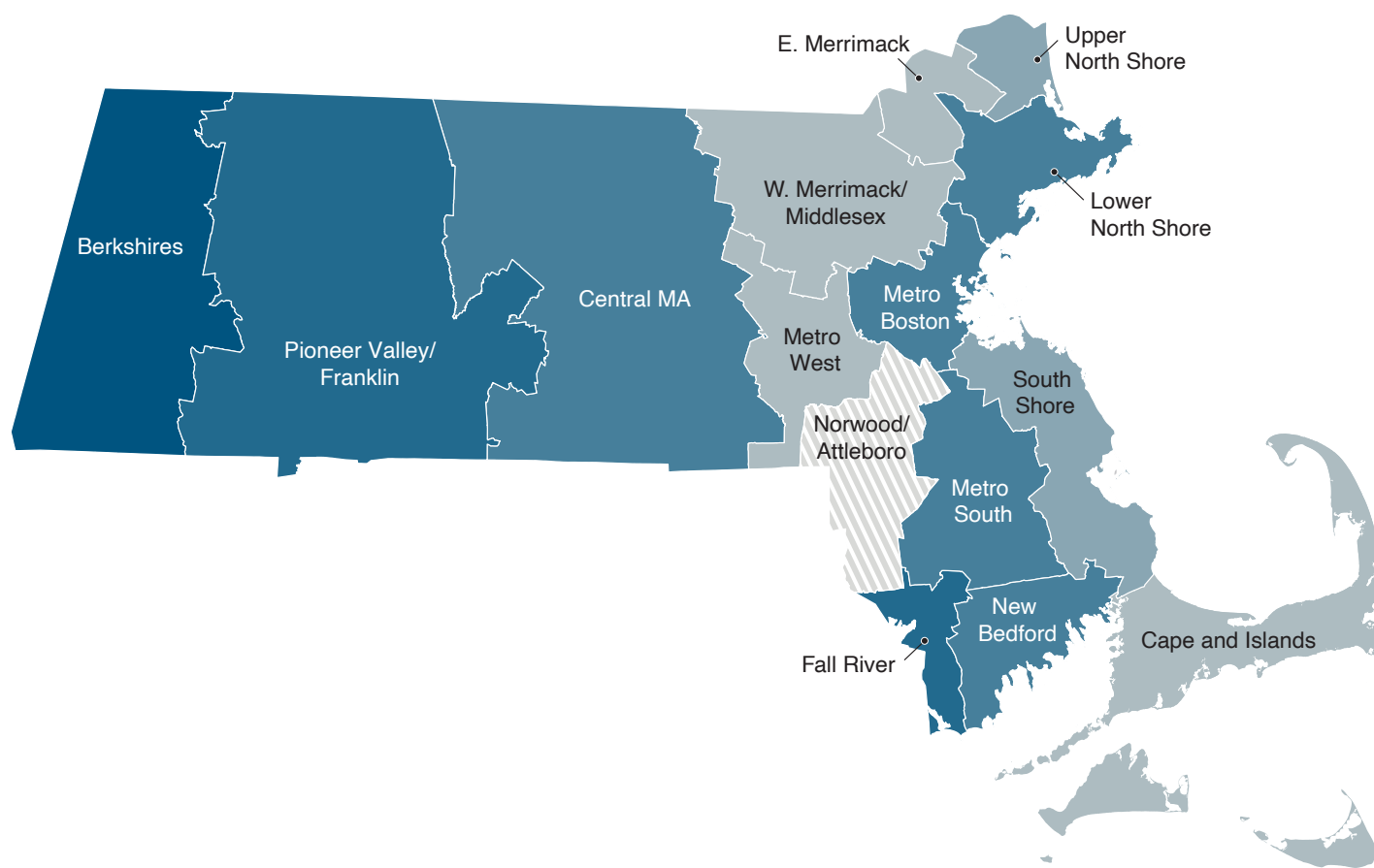
Percent of Total Inpatient Discharges

- <32.0%
- 32.0%–33.9%
- 34.0%–35.9%
- 36.0%–37.9%
- 38.0%–39.9%
- >=40.0%
- ▨ Incomplete data

Note: For this analysis, discharges were categorized into clinically meaningful independent behavioral health categories based on the listed primary and secondary diagnosis codes using the CCSR categories for ICD-10-CM diagnoses as related to behavioral health. A discharge may be associated with more than one behavioral health category because all primary and secondary diagnoses on the discharge record were considered and because ICD-10-CM diagnoses may be associated with more than one CCSR category. Discharges were classified into mutually exclusive groups: one or more mental health conditions associated with the discharge, but no substance use disorder, one or more substance use disorders associated with the discharge but no mental health condition, and co-occurring mental health and substance use conditions. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. As this hospital made up about one in four discharges in the Norwood/Attleboro region the data for this region has been suppressed. See [technical appendix](#) for more information and detailed behavioral health category definitions.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

Inpatient Discharges Associated with any Substance Use Disorder by Patient Region of Residence, FFY 2021



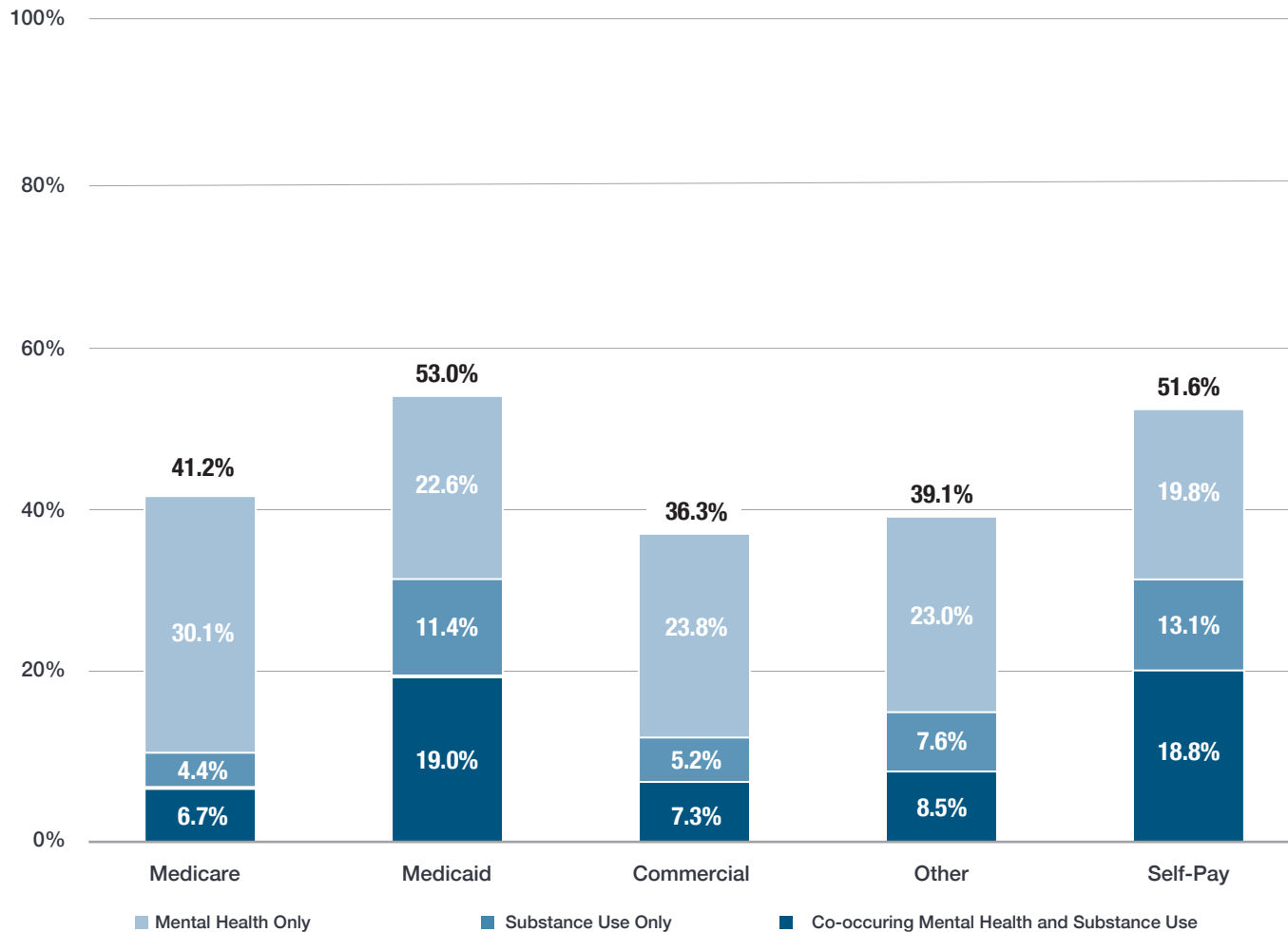
Percent of Total Inpatient Discharges

- <12.0%
- 12.0%–13.9%
- 14.0%–15.9%
- 16.0%–17.9%
- 18.0%–19.9%
- >=20.0%
- ▨ Incomplete data

For this analysis, discharges were categorized into clinically meaningful independent behavioral health categories based on the listed primary and secondary diagnosis codes using the CCSR categories for ICD-10-CM diagnoses as related to behavioral health. A discharge may be associated with more than one behavioral health category because all primary and secondary diagnoses on the discharge record were considered and because ICD-10-CM diagnoses may be associated with more than one CCSR category. Discharges were classified into mutually exclusive groups: one or more mental health conditions associated with the discharge, but no substance use disorder, one or more substance use disorders associated with the discharge but no mental health condition, and co-occurring mental health and substance use conditions. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. As this hospital made up about one in four discharges in the Norwood/Attleboro region the data for this region has been suppressed. See [technical appendix](#) for more information and detailed behavioral health category definitions.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

Inpatient Discharges Associated with Behavioral Health Conditions by Expected Primary Payer Type, FFY 2021



Note: For this analysis, discharges were categorized into clinically meaningful independent behavioral health categories based on the listed primary and secondary diagnosis codes using the CCSR categories for ICD-10-CM diagnoses as related to behavioral health. A discharge may be associated with more than one behavioral health category because all primary and secondary diagnoses on the discharge record were considered and because ICD-10-CM diagnoses may be associated with more than one CCSR category. Discharges were classified into mutually exclusive groups: one or more mental health conditions associated with the discharge, but no substance use disorder, one or more substance use disorders associated with the discharge but no mental health condition, and co-occurring mental health and substance use conditions. Due to incomplete data in FFY 2021, one hospital comprising 0.95% of inpatient discharges from FFY 2016 to 2020 was excluded from analyses in all years in this report. See [technical appendix](#) for more information and detailed behavioral health category definitions.

Data source: Massachusetts Acute Hospital Case Mix Hospital Inpatient Discharge Databases (HIDD), 2021

Notes

1 MassGIS, “MassGIS Data: Acute Care Hospitals,” date last modified October 20, 2020, <https://docs.digital.mass.gov/dataset/massgis-data-acute-care-hospitals>.

2 See note 1.

3 U.S. Census Bureau, “ACS Demographic and Housing Estimates,” 2015-2019 American Community Survey 5-Year Estimates (Massachusetts), Explore Census <https://data.census.gov/>.



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