



# 2019 ANNUAL HEALTH CARE COST TRENDS REPORT CHARTPACK



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# HOSPITAL UTILIZATION

# KEY FINDINGS

## HOSPITAL UTILIZATION

Massachusetts continues to have higher hospital utilization than the U.S., including inpatient, outpatient, and emergency department (ED) services, but the gap has narrowed in recent years.

After declining sharply from 2011 to 2014, Massachusetts inpatient hospital use has remained fairly stable in recent years, mirroring U.S. use trends; Massachusetts levels remain higher than in the U.S.

While total ED visit rates and rates of avoidable ED visits have declined in recent years, rates were unchanged between 2017 and 2018. The rate of behavioral health-related ED visits has grown since 2013, but also did not change between 2017 and 2018.

Avoidable ED visit rates varied more than two-fold (2.6 times) from highest to lowest across regions in Massachusetts in 2018.

All-payer readmission rates in Massachusetts did not improve in 2017, and even showed a small increase. The gap between Massachusetts' high Medicare readmission rates and the nation's continues to widen.

Between 2010 and 2018, the share of newborn deliveries and commercial discharges that took place at community hospitals declined, with a particularly sharp drop since 2016.

In Massachusetts, both inpatient and outpatient hospital care is increasingly provided by a few large provider systems.

# INTRODUCTION

## HOSPITAL UTILIZATION

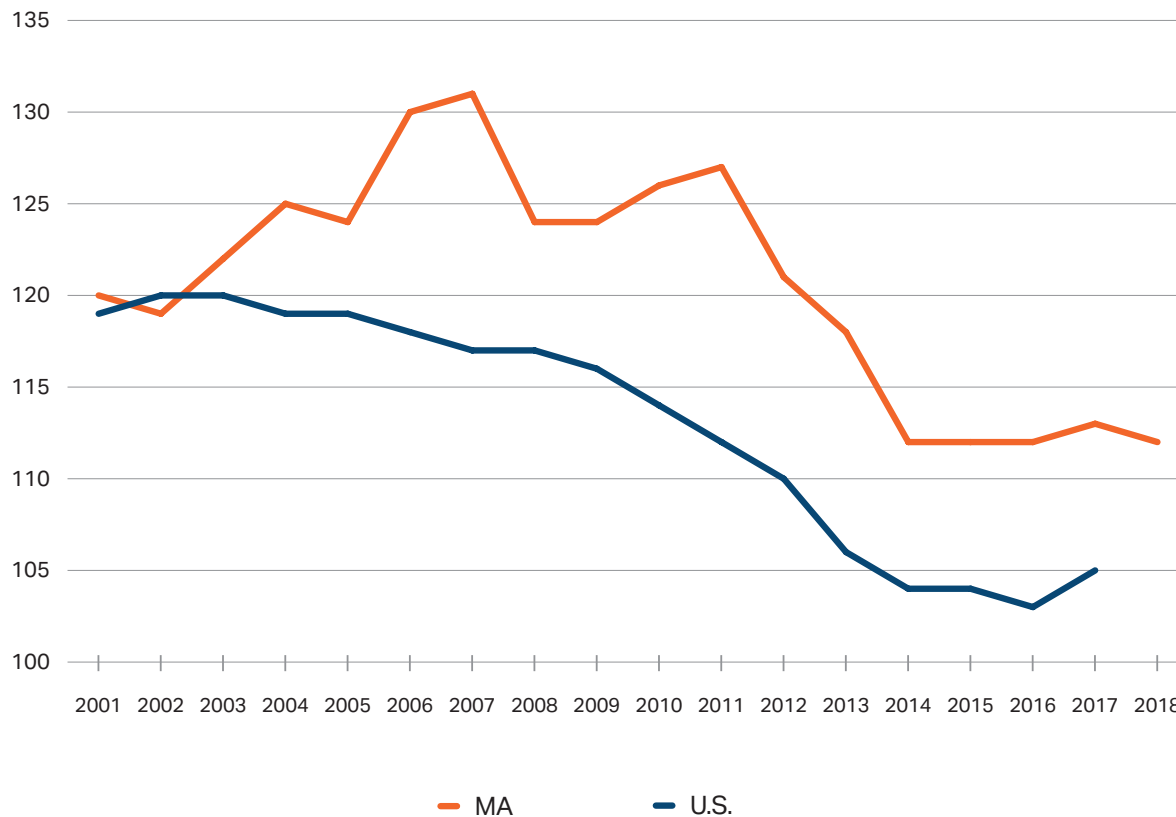
Massachusetts has consistently ranked well compared to other states on metrics such as health care access, but in 2019, Massachusetts ranked 31st in the nation for avoidable hospital use and costs according to the Commonwealth Fund's Scorecard on State Health System Performance, a worsening in rank from the previous year.<sup>1</sup> In previous Cost Trends Reports, the Massachusetts Health Policy Commission (HPC) has shown that hospital use in Massachusetts is higher than the national average, and a larger share of inpatient care is delivered by higher-cost academic medical centers (AMCs). The HPC has recommended action to reduce unnecessary hospital use and shift appropriate inpatient care to lower-cost community hospitals.

The higher utilization of care in intensive and costly settings in Massachusetts may reflect a number of factors such as patient preference or richer benefits and may, in some cases, reflect greater access to necessary care. These data also highlight care that could have been safely delivered in lower intensity settings or prevented entirely. Massachusetts' place in the variation between states warrants attention, given the implications of avoidable use of intensive care settings for patient experience and health system spending.

This section reviews recent trends in hospital use and examines several measures of avoidable hospital utilization, including potentially avoidable emergency department (ED) use and readmissions. It also examines trends in the Commonwealth in community-appropriate inpatient care occurring in community hospitals versus teaching hospitals and AMCs.

<sup>1</sup> Commonwealth Fund's 2019 Scorecard on State Health System Performance. Available at: <https://scorecard.commonwealthfund.org/> Accessed December 2019.

# INPATIENT HOSPITAL DISCHARGES PER 1,000 RESIDENTS IN MASSACHUSETTS AND THE U.S., 2001 – 2018



After declining sharply from 2011 to 2014, Massachusetts inpatient hospital use has remained near 2014 levels through 2018. Rates in the U.S. overall have also been relatively unchanged since 2014, following years of continued decline.

In 2017, the number of inpatient hospital discharges per 1,000 Massachusetts residents was 7.6% higher than the national average.

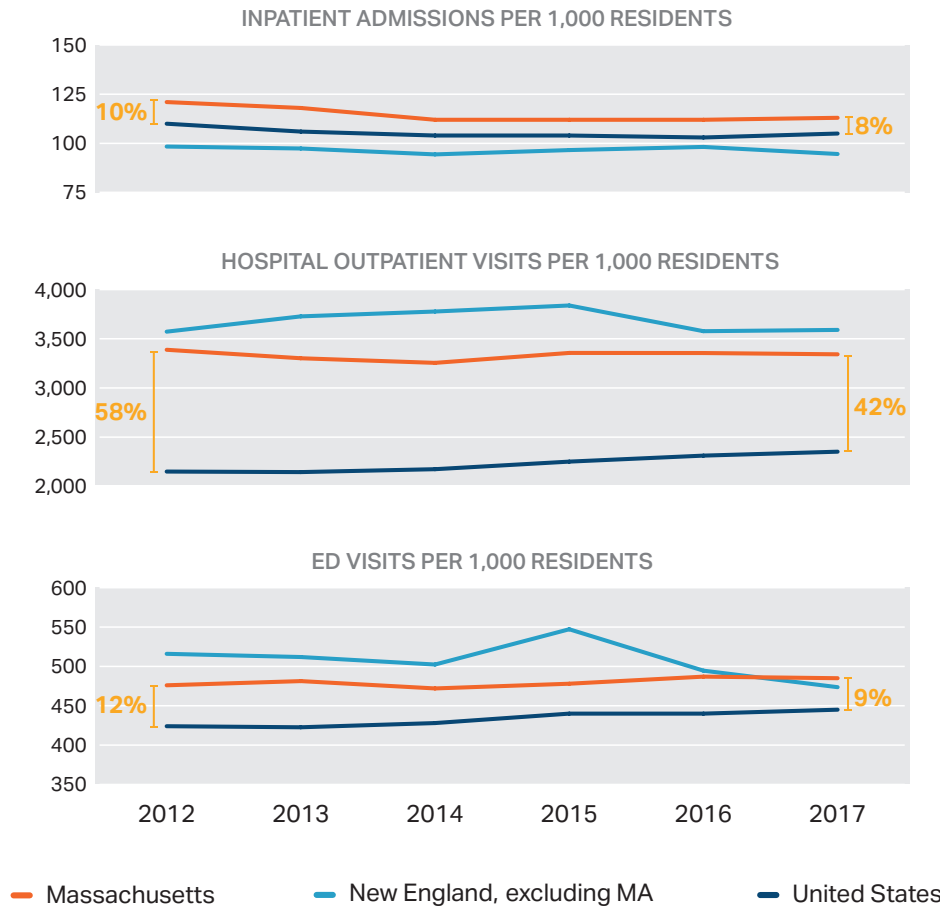
HOSPITAL

NOTES: U.S. data include Massachusetts. Massachusetts' 2017 data is based on HPC's analysis of Center for Health Information and Analysis discharge data.

SOURCES: Kaiser Family Foundation analysis of American Hospital Association data (U.S., 2001-2017), HPC analysis of Center for Health Information and Analysis Hospital Inpatient Database (MA 2018)



# HOSPITAL USE IN MASSACHUSETTS, NEW ENGLAND, AND THE U.S., 2012 – 2017



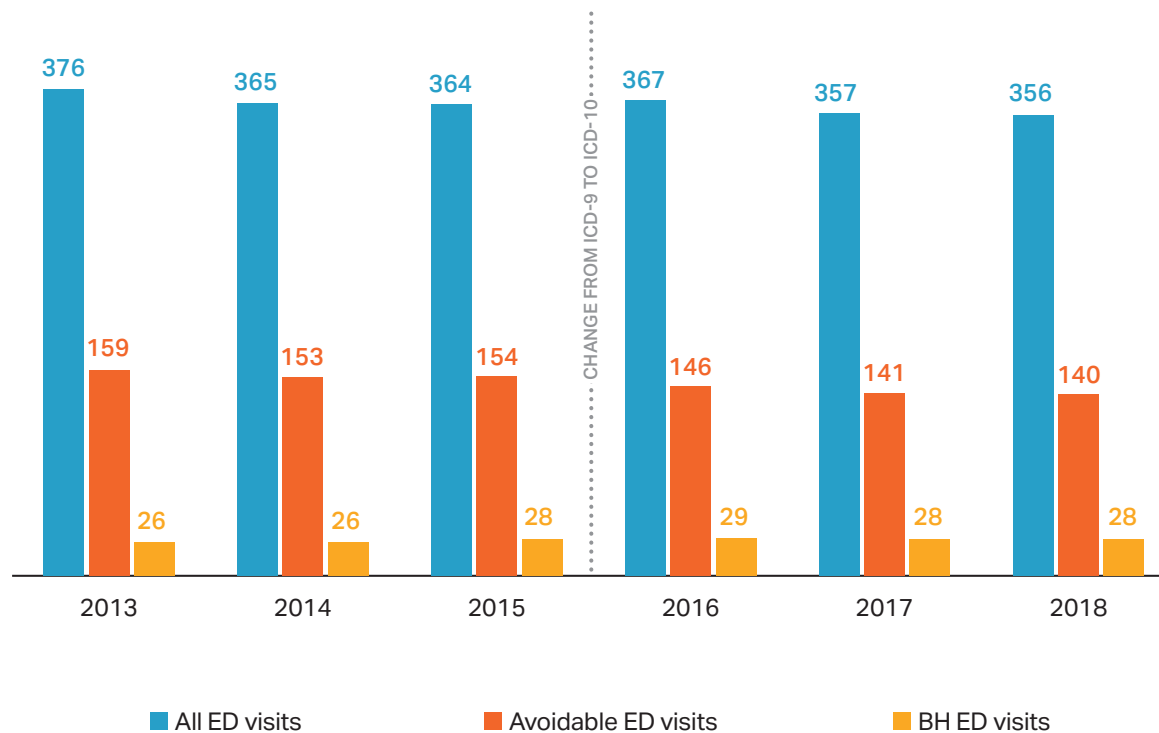
Massachusetts continues to have higher utilization of hospital inpatient, outpatient, and ED services relative to the U.S. However, between 2012 and 2017, the gap between Massachusetts and U.S. rates for each metric narrowed. For hospital outpatient visits, the difference between the Massachusetts and U.S. rates decreased by 16 percentage points over that time period, largely due to an increase in the U.S. rate.

While Massachusetts has somewhat lower utilization of hospital outpatient visits than its regional neighbors, the rate of inpatient admissions remains substantially higher (23% higher in 2012 vs 19% higher in 2017). Rates of ED visits were similar between Massachusetts and rest of New England in 2017, reflecting a decline in recent years in the rest of New England.

NOTES: Data are for community hospitals as defined by Kaiser Family Foundation, which represent 85% of all hospitals. Federal hospitals, long term care hospitals, psychiatric hospitals, institutions for the intellectually disabled, and alcoholism and other chemical dependency hospitals are not included. New England includes Connecticut, Maine, New Hampshire, Rhode Island and Vermont. Massachusetts is excluded from the New England category.

SOURCES: Kaiser Family Foundation State Health Facts, accessed Nov. 2019

# ALL ED VISITS, POTENTIALLY AVOIDABLE ED VISITS, AND BEHAVIORAL HEALTH ED VISITS PER 1,000 RESIDENTS, 2013 – 2018



Between 2013 and 2018, ED visits per 1,000 residents declined 5%, although rates were fairly constant between 2017 and 2018.

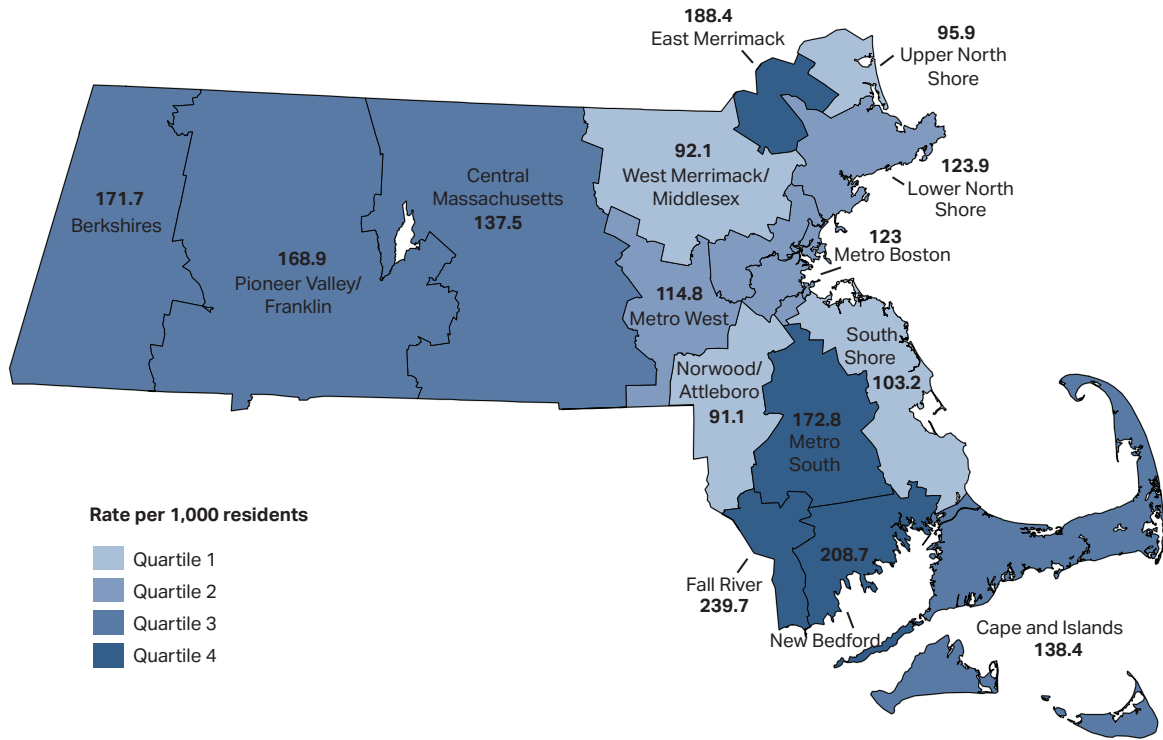
Potentially avoidable ED visits declined 12% between 2013 and 2018, but were similarly constant between 2017 and 2018. The change from ICD-9 to ICD-10 coding systems between 2015 and 2016 may have artificially reduced the rate of avoidable ED visits because more new codes are unclassified.

Behavioral health-related ED visit rates grew 7% between 2013 and 2018, but have remained fairly stable since 2015.

NOTES: Avoidable ED visits are based on the Billings algorithm, which classifies an ED visit into the following categories: Emergent - ED care needed and not avoidable; Emergent - ED care needed but avoidable; Emergent - primary care treatable; and Non-emergent - primary care treatable. "Avoidable" is defined here as ED visits that were emergent - primary care treatable or non-emergent - primary care treatable. Behavioral health ED visits were identified based on a principal diagnosis related to mental health and/or substance use disorder using the Clinical Classifications Software (CCS) diagnostic classifications. See Technical Appendix for details.

SOURCES: HPC analysis of Center for Health Information and Analysis Emergency Department Database, 2013 - 2018

# POTENTIALLY AVOIDABLE ED UTILIZATION BY HPC REGION, 2018



NOTES: Avoidable ED visits are based on the Billings algorithm, which classifies an ED visit into the following categories: Emergent - ED care needed and not avoidable; Emergent - ED care needed but avoidable; Emergent - primary care treatable; and Non-emergent - primary care treatable. Avoidable is defined here as ED visits that were emergent - primary care treatable or non-emergent - primary care treatable. Behavioral health ED visits were identified based on principal diagnosis using the Clinical Classifications Software (CCS) diagnostic classifications. See technical appendix for details.

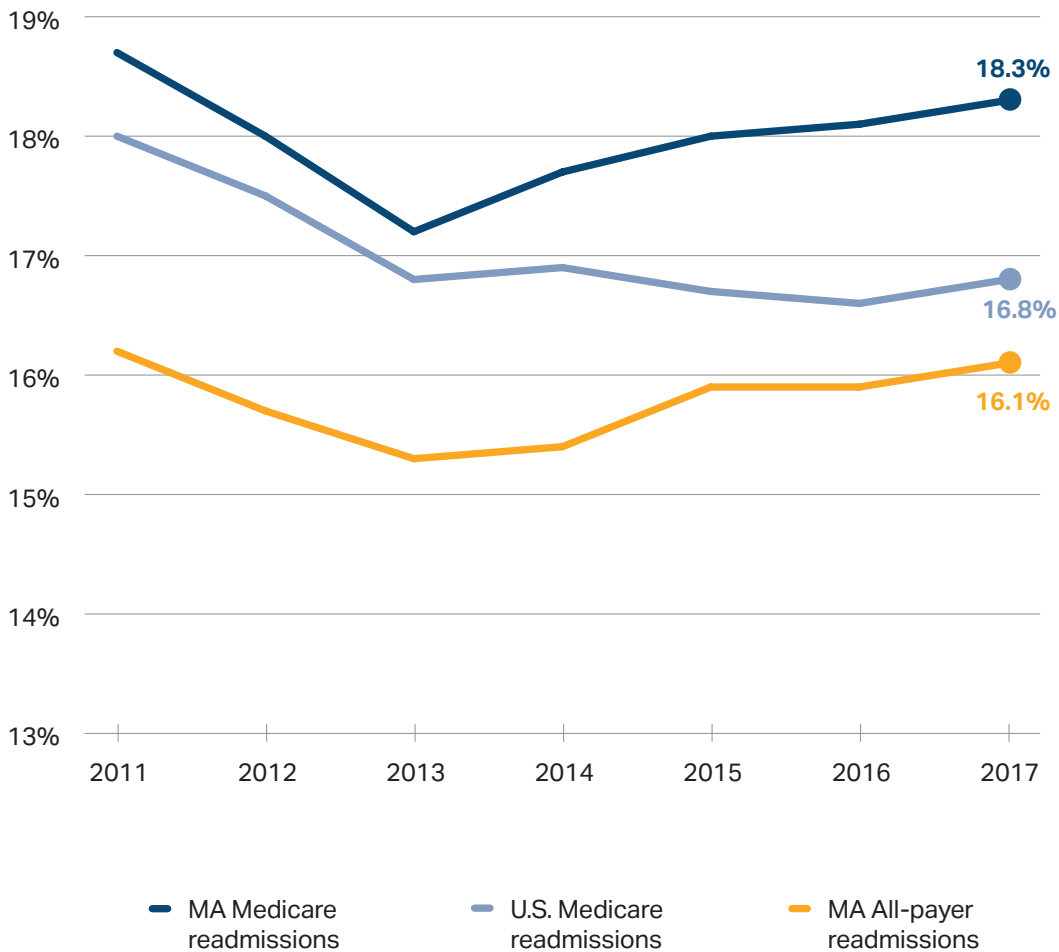
SOURCES: HPC analysis of Center for Health Information and Analysis Hospital Inpatient Discharge Database, 2018

The rate of potentially avoidable ED visits is a key metric of health system efficiency and quality. An avoidable visit signals care that could have been treated by a primary care provider, either at the time of the visit or through prevention. The statewide rate of avoidable ED visits was 140.2 per 1,000 residents in 2018, representing a 3.8% decline in avoidable ED utilization since 2016.

Despite the overall drop in statewide rates, there is considerable variation by region. Rates varied more than two-fold, from 239.7 avoidable ED visits per 1,000 residents in Fall River to 91.1 per 1,000 residents in Norwood/Attleboro.

Several regions showed notable declines (more than 10%) in the rate of avoidable ED visits between 2016 and 2018 including Cape Cod and Islands, Metro Boston, and Central Massachusetts. The only region with an increase during this time was Pioneer Valley/Franklin (2.4%).

# 30-DAY READMISSION RATES, MASSACHUSETTS AND THE U.S., 2011 – 2017



Hospital readmissions represent potentially avoidable hospital use and are a measure of health system performance.

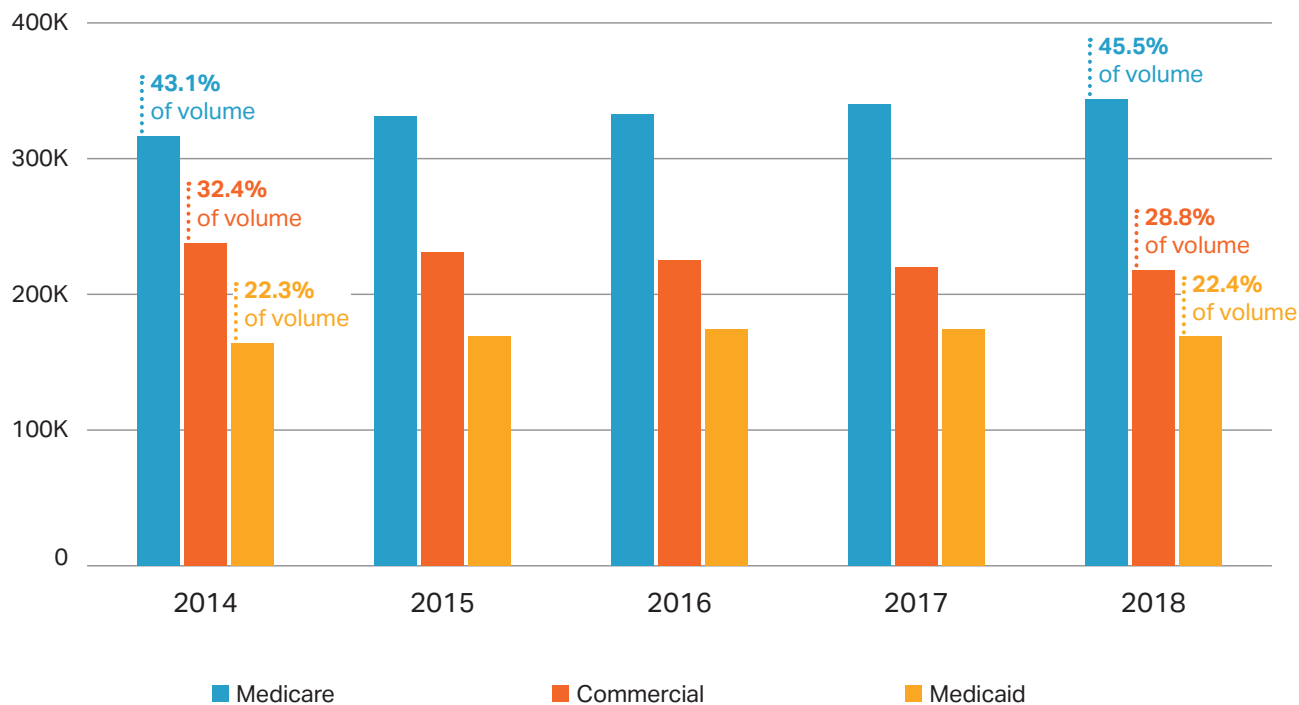
After near convergence with U.S. rates in 2013, Massachusetts' Medicare readmission rates have continued to trend upward. National Medicare readmission rates ticked up in 2017 after trending downward since 2014.

All-payer readmission rates in Massachusetts showed no improvement in 2016, and a small increase in 2017.

HOSPITAL

SOURCES: Centers for Medicare and Medicaid Services (U.S. and MA Medicare), 2011-2017; Center for Health Information and Analysis (all-payer MA), 2011-2017

# TOTAL INPATIENT HOSPITAL DISCHARGES BY PAYER, 2014 – 2018



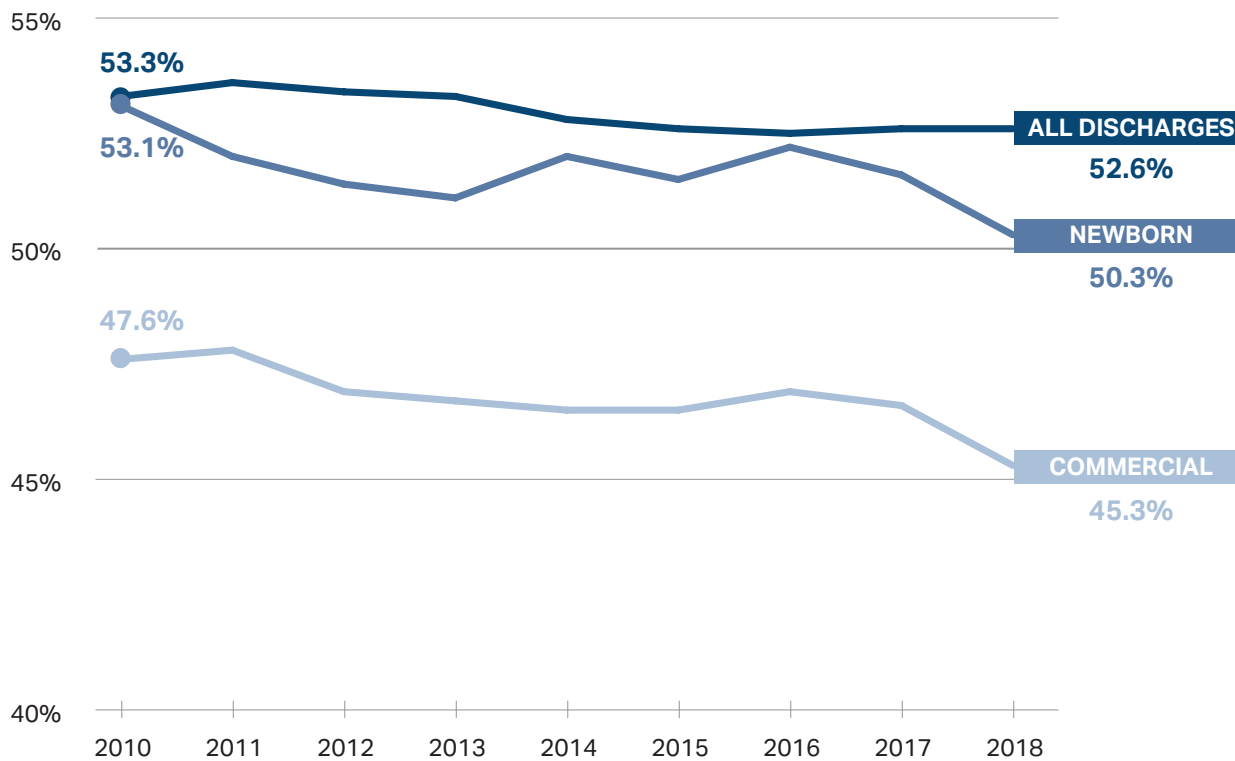
Over the past five years, Medicare patients have comprised an increasing share of all inpatient hospital discharges in Massachusetts, growing from 43.1% in 2014 to 45.5% in 2018. This trend is partly due to an aging population and therefore a higher share of the population enrolled in Medicare. The share of discharges from commercially-insured patients has decreased, from 32.4% in 2014 to 28.8% in 2018.

Since commercial payment rates are higher than public payer rates for most hospitals, this shift in the composition of inpatient volume has financial implications for hospitals. Chapter 3 of the 2019 Cost Trends Report discusses the utilization and spending trends seen in inpatient hospital volume in more detail.

NOTES: Out of state residents (~5% of discharges) are excluded from this analysis. Medicaid category includes free care, health safety net, and CommonwealthCare/ ConnectorCare plans. All other payers (other government, self/pay) are not illustrated, but accounted for in percentage calculations.

SOURCES: HPC analysis of Center for Health Information and Analysis Inpatient Discharge Database, 2014-2018

# INPATIENT DISCHARGES IN COMMUNITY HOSPITALS, 2010 – 2018



One strategy to reduce health care spending is to shift community-appropriate inpatient care away from higher-cost academic medical centers and teaching hospitals.

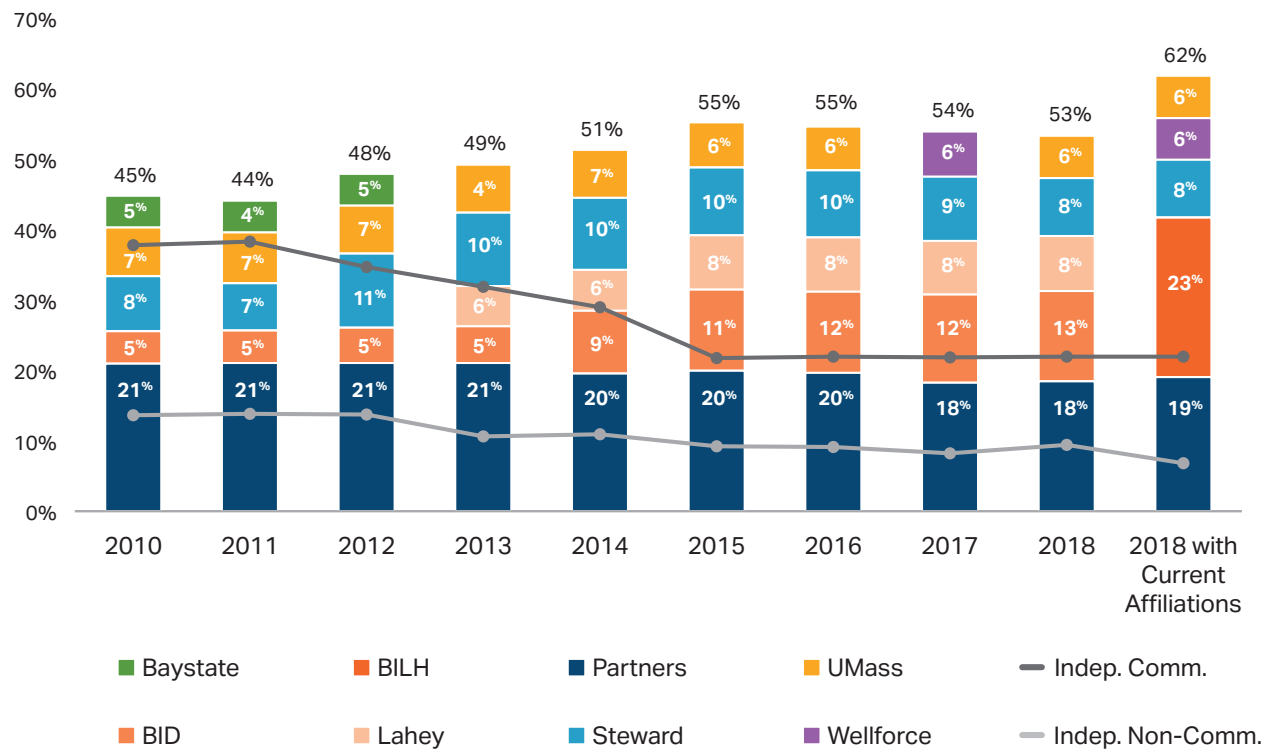
The share of all discharges occurring at community hospitals has remained roughly constant since 2010. However, since 2010, the share of newborn deliveries and commercial discharges taking place at community hospitals has declined, especially since 2016, implying that patients covered by public payers account for a growing share of hospital volume.

HOSPITAL

NOTES: The Center for Health Information and Analysis defines community hospitals as general acute care hospitals that do not support large teaching and research programs.

SOURCES: HPC analysis of Center for Health Information and Analysis Hospitals Inpatient Discharge Database, 2010-2018

# SHARE OF INPATIENT AND OUTPATIENT CARE IN THE FIVE LARGEST HOSPITAL SYSTEMS AND INDEPENDENT HOSPITALS, 2010 – 2018



In Massachusetts, hospital care is increasingly provided by a small number of large provider systems. Previous HPC research showed continued consolidation in inpatient care. Examining inpatient and outpatient department care combined, the HPC found that 53% of such care was provided at one of the five largest hospital systems in 2018, a slight decrease from earlier years.

However, after the formation of Beth Israel-Lahey Health (BILH) in 2019, the top five hospital systems will account for an estimated 62% of all inpatient and outpatient department care statewide.

The formation of BILH is projected to result in a slight decrease in care at independent non-community hospitals, but is not projected to impact the share of care at independent community hospitals, which have consistently provided about 22% of care in recent years.

NOTES: Inpatient care is measured in hospital discharges for general acute care services. Hospital outpatient care is measured in outpatient discharge equivalents, the quantity of outpatient services expressed in inpatient stay equivalents. See technical appendix for details.

SOURCES: HPC analysis of Center for Health Information and Analysis Hospital Cost Reports, 2010-2018

# POST-ACUTE CARE



## KEY FINDINGS

### POST-ACUTE CARE

Massachusetts has a higher rate of discharge to institutional PAC and home health than the national average.

In 2018, among the 30 hospitals with the highest discharge volume, Steward St. Elizabeth's Medical Center had the highest adjusted rate of discharge to institutional PAC at 26.7%, while Brigham and Women's Faulkner Hospital had the lowest rate at 14.2%. These hospitals also had the respective highest and lowest rates in 2017.

The percentage of Massachusetts hospital discharges to institutional PAC dropped by almost 1 percentage point for a third year in 2018, while home health discharges increased by 0.8 percentage points. Routine discharges remained stable. The decrease in discharges to institutional PAC between 2017 to 2018 is consistent with trends since 2015.

# INTRODUCTION

## POST-ACUTE CARE

Following a stay in an acute care hospital, patients may receive a range of rehabilitative services known as post-acute care (PAC). Depending on the intensity of care required, patients may receive these services at home (home health) or in an institutional setting such as a skilled nursing facility (SNF), inpatient rehabilitation facility (IRF), or long-term care hospital (LTCH). Patients with a routine discharge may also receive some services on an outpatient basis, such as physical therapy.

PAC is a large category of health care spending, representing nearly \$54 billion and 16% of total Original Medicare spending nationwide.<sup>1</sup> It is also the service category with the highest regional variation;<sup>2</sup> literature suggests that almost three quarters of the variation in Medicare spending per beneficiary between hospital referral regions (HRRs) is due to differential spending on PAC.<sup>3</sup>

The HPC previously found that Massachusetts has higher rates of discharge to institutional PAC and home health than the U.S. average, across all payers, contributing to higher PAC spending. In 2017, Massachusetts Original Medicare spending on PAC exceed \$1.6 billion, and annual PAC spending per beneficiary in Massachusetts was 28.9% higher (\$460 more) than the U.S. average.<sup>1</sup>

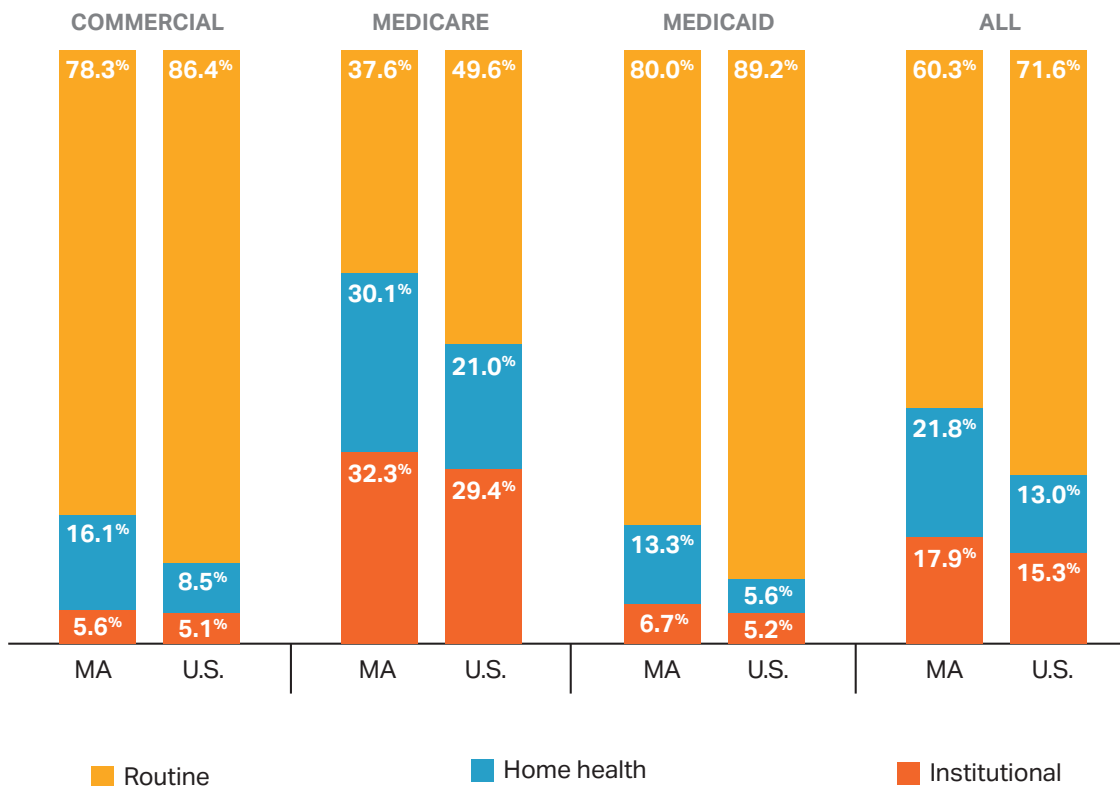
Institutional PAC is, on average, considerably more expensive than home health. Choosing the appropriate setting of PAC is important for ensuring value-based care and can have a substantial impact on costs and patient experience.

1 HPC analysis of 2017 CMS Medicare Geographic Variation Public Use File, State/County Report- All Parts A and Parts B Beneficiaries.

2 MedPAC. Report to Congress: Regional Variation in Medicare Part A, Part B, and Part D Spending and Service Use. Sep 2017.

3 Newhouse JP et al., editors, Institute of Medicine. Variation in Health Care Spending: Target Decision Making, Not Geography. The National Academies Press; 2013

# PAC DISCHARGES, ALL DRGS, ALL PAYERS, 2016



Massachusetts has a higher rate of discharge to institutional PAC and home health than the U.S. average.

Across all payers in 2016, Massachusetts had an institutional discharge rate that was 2.6 percentage points higher than the U.S. average and a home health discharge rate that was 8.8 percentage points higher.

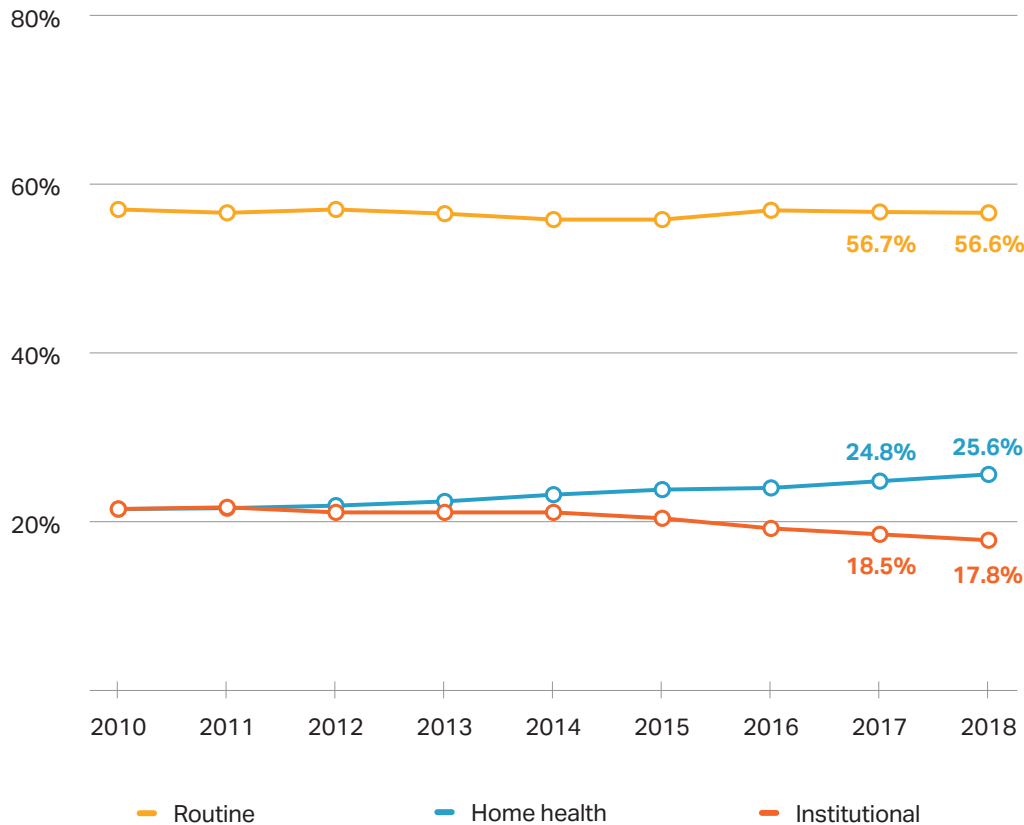
Consistent with trends in prior years, Medicare had the largest differential in 2016, with the Massachusetts rate of discharge to institutional PAC exceeding the national average by 2.9 percentage points.

Patients covered by commercial insurance were nearly twice as likely to be discharged to home health care if they lived in Massachusetts compared to the rest of the nation.

NOTES: Institutional settings include skilled nursing facilities, inpatient rehabilitation facilities, and long-term care hospitals. Routine = discharge to home with no formal post-acute care.

SOURCES: HPC analysis of Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample Survey and State Inpatient Sample, 2016

# ADJUSTED PERCENTAGE OF DISCHARGES TO POST-ACUTE CARE, ALL DRGS, 2010 – 2018



The percentage of patients discharged to institutional PAC following a hospitalization dropped by almost 1 percentage point for a third year in 2018.

Since 2010, the rate of discharge to institutional PAC has dropped steadily (3.6 percentage points in total), and nearly two-thirds of the reduction occurred between 2015 and 2018.

Conversely, the use of home health has grown, increasing by 0.8 percentage points from 2017 to 2018 and 4.1 percentage points in total since 2010.

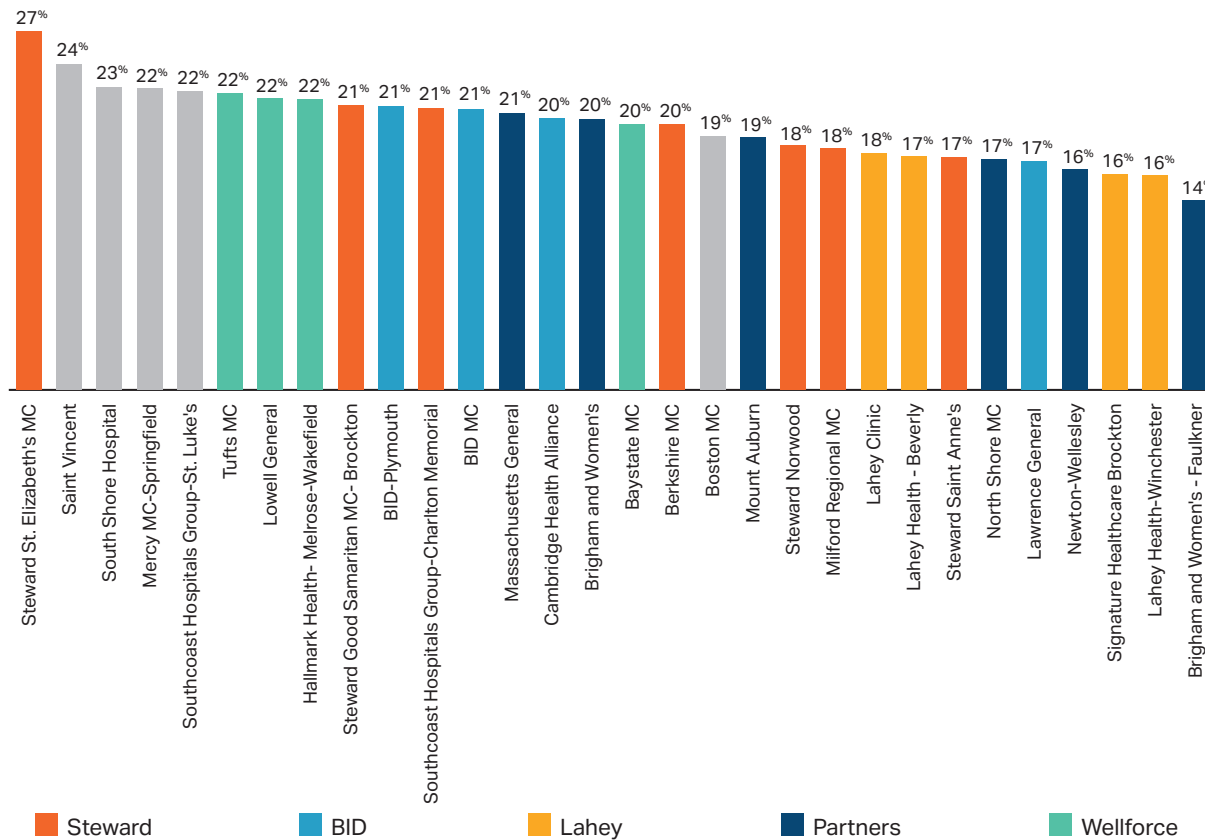
The reduction in institutional PAC discharges is partially driven by changes in discharge patterns for musculoskeletal conditions, such as hip and knee replacements. The rate of discharge to institutional PAC for these conditions declined by 6.6 percentage points between 2015 and 2018.

PAC

NOTES: Out of state residents and those under 18 are excluded. Institutional post-acute care settings include skilled nursing facilities, inpatient rehabilitation facilities, and long-term care hospitals. Rates adjusted using ordinary least squares (OLS) regression to control for age, sex, and changes in the mix of diagnosis-related groups (DRGs) over time. Discharges from hospitals that closed and specialty hospitals, except New England Baptist, were excluded. Several hospitals (UMass Memorial Medical Center, Clinton Hospital, Cape Cod Hospital, Falmouth Hospital, Marlborough Hospital) were excluded due to coding irregularities in the database. Routine = discharge to home with no formal post-acute care.

SOURCES: HPC analysis of Center for Health Information and Analysis Hospital Inpatient Discharge Database, 2010-2018

# ADJUSTED INSTITUTIONAL DISCHARGE RATES FOR 30 HIGHEST VOLUME HOSPITALS, 2018



The rate of discharge to institutional PAC varied significantly across high volume hospitals in Massachusetts (ranging from 14% to 27%), even after adjusting for patient age, sex, admission source, payer, and diagnosis.

Of the top 30 hospitals by discharge volume, Partners HealthCare hospitals and Lahey Health hospitals had among the lowest adjusted rates of discharge to institutional PAC.

Prior research has shown that variation in PAC is influenced by non-clinical factors, such as provider practice patterns, availability of support at home, and the supply of services.<sup>1</sup> The HPC analyzed the variation in institutional PAC discharges by HPC regions among Massachusetts Medicare beneficiaries and found no relationship between the number of SNF beds and the regional rate of institutional discharges. More research is needed on the factors driving variation between hospitals in Massachusetts.

1. Kane et al. Geographic variation in the use of post-acute care. Health Services Research, 2002. Jun; 37(3): 667-682. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1434656/>

NOTES: Hospital rates have been adjusted for major diagnostic category, age, sex, admission source and primary payer. Several acute care hospitals (UMass Memorial Medical Center, Clinton Hospital, Cape Cod Hospital, Falmouth Hospital, Marlborough Hospital) were excluded due to coding irregularities in the database.

SOURCES: HPC analysis of Center for Health Information and Analysis Hospital Inpatient Discharge Database, 2018

# **ALTERNATIVE PAYMENT METHODS**

## KEY FINDINGS

### ALTERNATIVE PAYMENT METHODS

Among the three largest commercial insurers, the rate of APM adoption grew in PPO, indemnity, and other non-HMO/POS products between 2016 and 2018. The rate of APM adoption among HMO/POS plans for these insurers saw a slight increase from 2017 to 2018.

Smaller Massachusetts-based insurers saw a drop in APM adoption in both HMO/POS and PPO, indemnity, and other non-HMO/POS plans between 2016 and 2018.

Due to these offsetting effects, and a shift in overall membership away from the largest three payers, the overall rate of APM adoption across all products in Massachusetts declined from 45.0% in 2016 to 42.8% in 2018.

Among commercial members who were required to select a PCP by their plans and who were in an HMO/POS plan, the percent of members in global full payment arrangements decreased from 35.3% in 2016 to 31.5% in 2018. The percent of members in global partial payment arrangements increased. Under global partial APMs, budgets do not include certain services, such as pharmacy or behavioral health.

There is considerable variation by provider group in whether their APM arrangements have “upside only” versus “two-sided” or “downside” risk, which can result in financial losses for the provider group if a target is not met.<sup>1</sup> Several organizations have less HMO/POS member months in “two-sided” arrangements in 2018 than they did in 2016.

<sup>1</sup> Two-sided and downside risk refer to the same type of arrangement where the provider is both financially at risk but also has the ability for financial gain.

# INTRODUCTION

## ALTERNATIVE PAYMENT METHODS

Alternative payment methods (APMs) are a key strategy to promote high-quality, efficient care and reduce health care costs. Traditional fee-for-service (FFS) payment methods reward providers for the volume of services provided, while APMs, such as global budget contracts and bundled payments, seek to promote value-based care to reduce unnecessary utilization. These types of payments can be used in most insurance products. Earlier growth in APM adoption has stalled among Massachusetts payers, with the exception of MassHealth. In 2018, APM adoption increased from 37.8% to 67.7% among MassHealth members receiving full benefits from managed care organizations or ACOs (see CHIA's 2019 Annual Report<sup>1</sup>). APM adoption requires both payers and providers to agree to use these contracts.

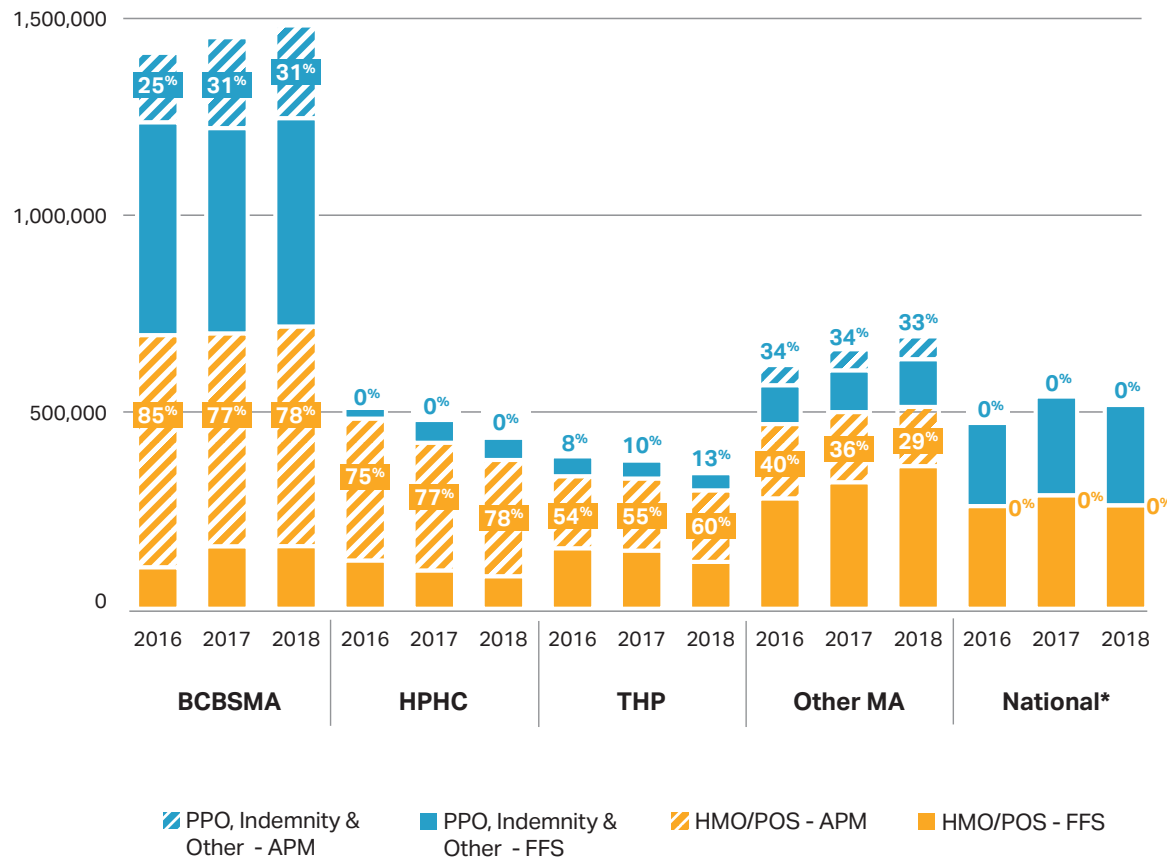
In commercial insurance products, 40.4% of members in Massachusetts had primary care physicians engaged in an APM in 2018.<sup>1</sup> Many providers note that operating in an environment where fewer than half of their patients are covered under an APM contract (and the rest paid under traditional FFS) creates conflicting incentives. In order for APM incentives to work effectively, providers need a critical mass of patients covered under risk-based contracts for the financial benefits of reducing avoidable utilization under an APM to outweigh the FFS losses of those services. In addition, the recent growth in partial global APMs mean that more patients have their care linked to both APM and FFS contracts.

This section focuses on APMs in the commercial market in Massachusetts, including trends in uptake of APMs, use of APMs by product type and payer, trends in type of APM by payer, and adoption of different risk sharing contracts by provider organization.

<sup>1</sup> Center for Health Information and Analysis. Performance of the Massachusetts Health Care System Annual Report. Oct. 2019.



# COMMERCIALY-INSURED MEMBER MONTHS UNDER APMS IN MASSACHUSETTS (MASSACHUSETTS-BASED INSURERS AND NATIONAL INSURERS), 2016 – 2018



NOTES: The three largest insurers in Massachusetts include Blue Cross Blue Shield of MA (BCBSMA), Harvard Pilgrim Health Plan (HPHP), and Tufts Health Plan (THP). Other Massachusetts plans include AllWays, BMC HealthNet Plan, Fallon Community Health Plan, Health New England, Health Plans Inc, and UniCare (Anthem). National insurers include CIGNA and United Health Plans. \*Aetna is excluded from this analysis due to data irregularities.

SOURCES: HPC analysis of Center for Health Information and Analysis Annual Report APM data set, 2019

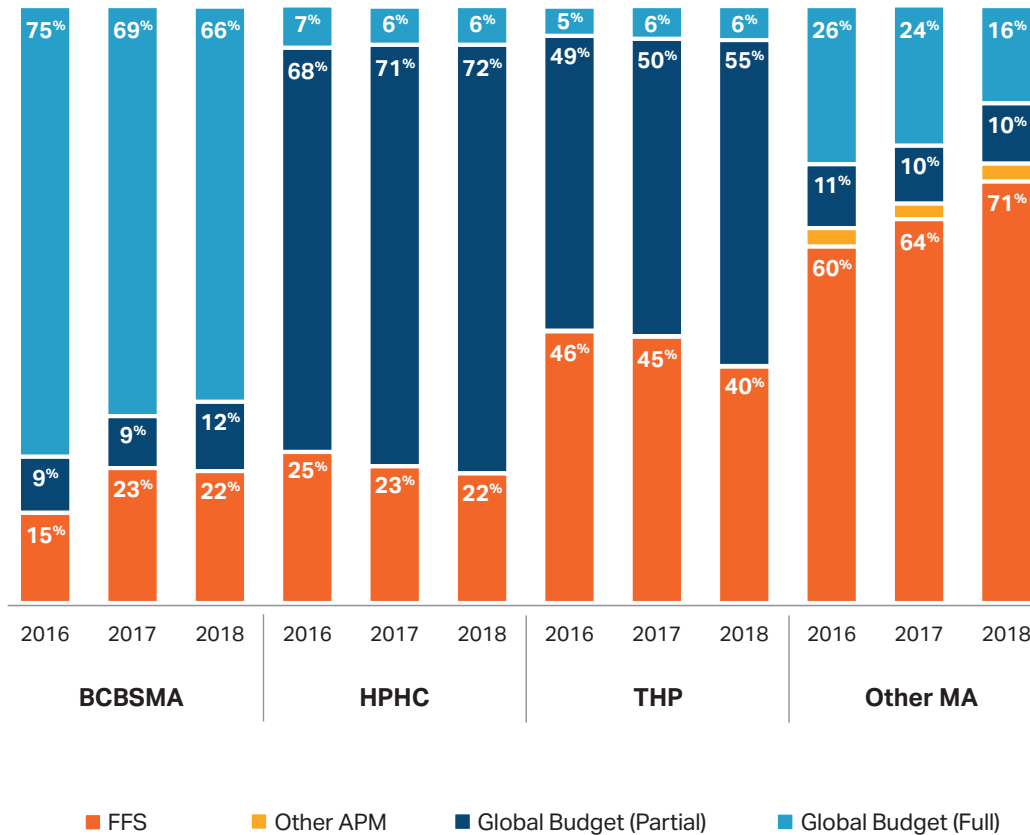
The overall rate of APM adoption across all products in Massachusetts declined from 45.0% in 2016 to 42.8% in 2018.

Both Blue Cross Blue Shield of Massachusetts (BCBSMA) and Tufts Health Plan (THP) saw an increase in APM adoption among members with PPO and other non-HMO/POS products from 2016 to 2018, while Harvard Pilgrim Health Care (HPHC) continued to have no APM use for PPO members.

While THP had the greatest growth from 2016 to 2018 in APM adoption for HMO/POS members, THP still had lower APM use in these products than BCBSMA or HPHC. The percentage of HMO/POS members in APM contracts grew slightly for BCBSMA and HPHC members from 2017 to 2018. Smaller Massachusetts-based insurers' APM adoption rates dropped by 11 percentage points among HMO/POS products from 2016 to 2018. There was no APM use among national insurers for Massachusetts members.

APM

# TRENDS IN TYPE OF APM FOR HMO/POS MEMBERS BY MASSACHUSETTS-BASED INSURERS, 2016 – 2018



In global full budget arrangements, all of the members' spending is under a risk-based contract. For payers with members under global partial budgets, the members have some services carved out of the risk-based contract, such as behavioral health or prescription drugs.

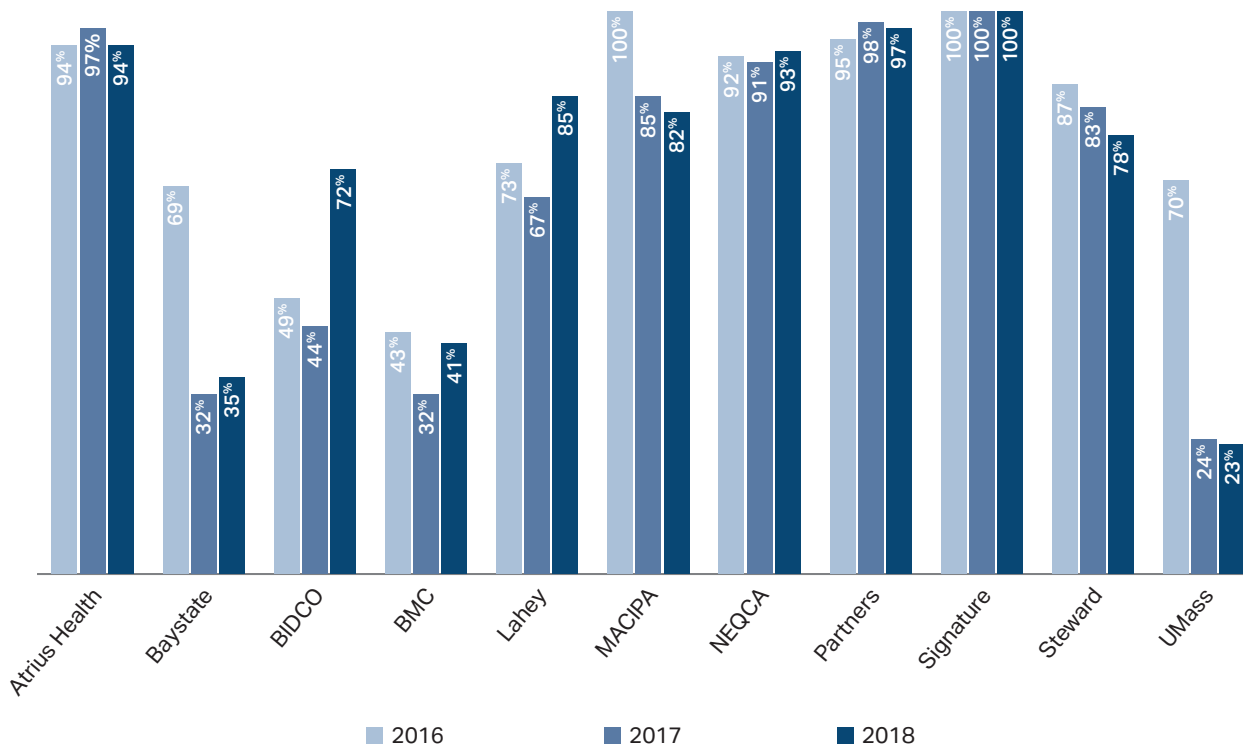
Overall, 31.5% of HMO/POS commercial members months for Massachusetts-based insurers were under global full budget arrangements in 2018, down from 35.3% in 2016.

The percent of HMO/POS membership in global partial budget arrangements increased for the largest three insurers. For BCBSMA, part of the growth in global partial budget arrangements represented a shift from global full budget arrangements. In contrast, THP saw a shift away from FFS arrangements.

NOTES: The three largest insurers in Massachusetts include Blue Cross Blue Shield of MA (BCBSMA), Harvard Pilgrim Health Plan (HPHP), and Tufts Health Plan (THP). Other Massachusetts plans include AllWays, BMC HealthNet Plan, Fallon Community Health Plan, Health New England, Health Plans Inc, and UniCare (Anthem). Population is commercial members required to select a PCP by their plan and who were in an HMO/POS plan.

SOURCES: HPC analysis of Center for Health Information and Analysis Annual Report APM data set, 2019

# PERCENTAGE OF RISK ARRANGEMENTS THAT INCLUDE SHARED LOSSES (“UPSIDE AND DOWNSIDE RISK”) BY PROVIDER GROUP, 2016 – 2018



APMs can include both “upside” risk (where providers gain bonus payments if spending is below a target) and “downside” or “two-sided” risk, where providers can also lose money if they exceed their target. The latter provides a stronger incentive to avoid unnecessary care and reduce prices.

Provider organizations vary considerably in the nature of their risk arrangements. The vast majority of patients covered by APMs of Atrius, NECQA, Partners HealthCare, and Signature are in contracts with downside risk. UMass Memorial and Baystate have fewer downside risk contracts in 2017 and 2018.

APM

NOTES: Only member months where the members who were required to select a PCP by their plan and were in an HMO/POS plan with full commercial claims were included in this analysis.

SOURCES: HPC analysis of Center for Health Information and Analysis Annual Report APM data set, 2019

# **PROVIDER ORGANIZATION PERFORMANCE VARIATION**

# KEY FINDINGS

## PROVIDER ORGANIZATION PERFORMANCE VARIATION

Provider organizations vary greatly in their per patient per year total medical spending for their primary care patients (both with and without risk adjustment) with commercial insurance. Patients attributed to Partners HealthCare had the highest unadjusted and adjusted medical spending. Unadjusted spending for patients attributed to Partners HealthCare was 53% (\$2,191 per patient per year) higher than patients attributed to the lowest unadjusted spending organization (Reliant). Adjusted medical spending for patients attributed to Partners HealthCare was 33% (\$1,500) higher than patients attributed to the lowest spending organization after risk-adjustment (Atrius).

Emergency department (ED) utilization varied across provider organizations among commercially-insured patients. Patients attributed to Boston Medical Center (BMC) providers had 70% more ED visits and 145% more avoidable ED visits than patients attributed to providers affiliated with Atrius or South Shore Health.

Total inpatient utilization among commercial patients varied less (25%) across provider organizations, though potentially avoidable hospital visits (admissions for ambulatory care-sensitive conditions) varied almost two-fold.

A study of seven low value care services identified \$13 million of potentially unnecessary health care spending in 2017 and more than 100,000 patients exposed to at least one low-value service of 1.8 million commercial patients analyzed. There was substantial variation across organizations in provision of these seven services.

# INTRODUCTION

## PROVIDER ORGANIZATION PERFORMANCE VARIATION

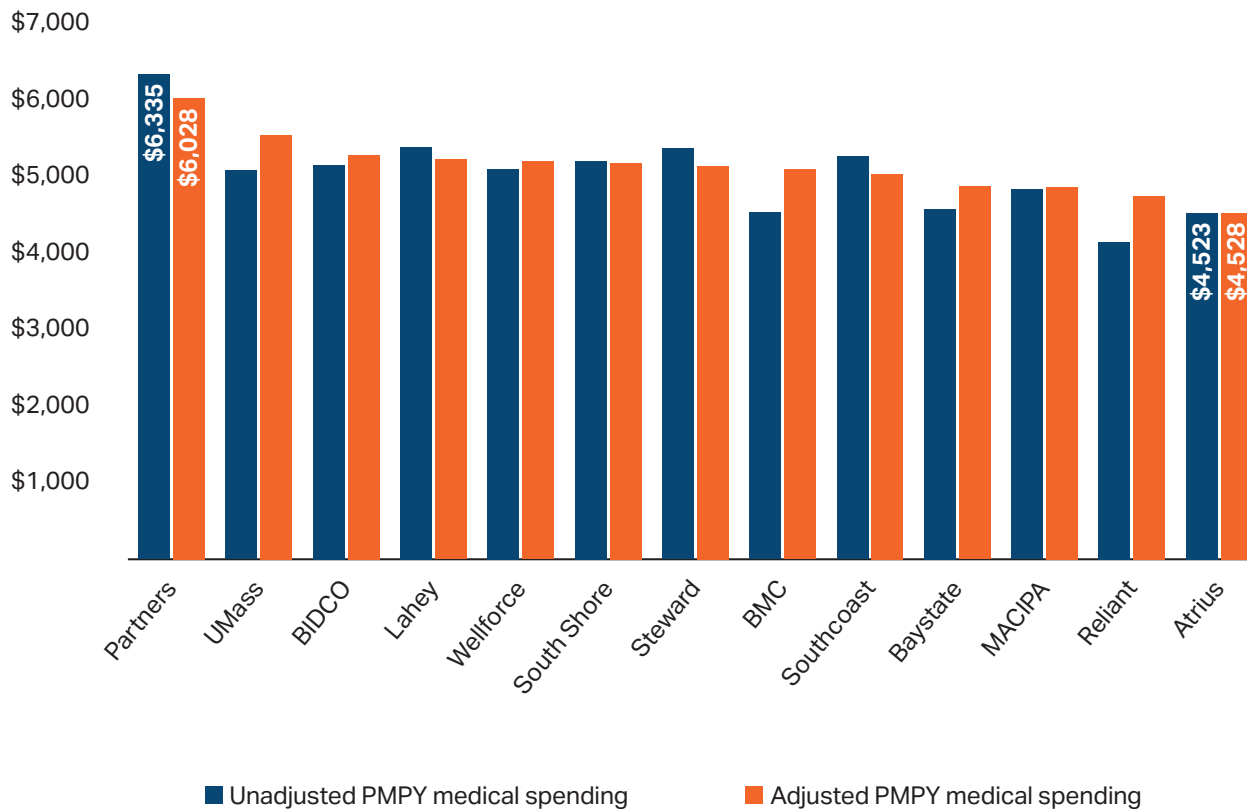
Analyzing variation in performance between provider organizations across a range of spending and utilization measures allows for identification of areas for improvement in care delivery across the Commonwealth. These analyses rely on attribution of patients to a primary care provider (PCP) based on data in the Massachusetts All-Payer Claims Database (APCD), and attributing PCPs to their affiliated provider organization based on data from the Registration of Provider Organizations. Using this attribution methodology, the HPC reports on a cohort of ~900,000 patients with private insurance through Blue Cross Blue Shield of Massachusetts, Tufts Health Plan, Harvard Pilgrim Health Plan, Anthem, or Neighborhood Health Plan (now Allways) who were attributed to PCPs affiliated with one of the ten largest provider organizations in the state in 2017. Details of the methodology have been previously published<sup>1</sup> and can also be found in the **Technical Appendix**.

The HPC's previous work in this area focused primarily on evaluating cost of care and cost drivers. This section of the Chartpack continues to analyze the performance of provider organizations in the Commonwealth and includes reporting on medical spending, inpatient and Emergency Department (ED) utilization, medication adherence, and low value care.

All results in this section (with the exception of low-value care measures) have been statistically adjusted for differences in age, sex, health status, insurer and product type, and community-level variables related to education and socioeconomic status. However, other potential unmeasured differences in patient populations may influence results.

<sup>1</sup> Massachusetts Health Policy Commission. 2017 Cost Trends Report. March 2018. Available at: <https://www.mass.gov/doc/2017-health-care-cost-trends-report/download>

# UNADJUSTED AND ADJUSTED MEDICAL SPENDING PER MEMBER PER YEAR BY PROVIDER ORGANIZATION, 2017



Partners HealthCare had the highest unadjusted and adjusted total medical spending in 2017. At \$6,028 per member per year (PMPY), Partners HealthCare’s adjusted PMPY spending was 9% higher than the next highest provider group (UMass Memorial), 17% higher than the average of the provider groups shown, and 33% higher than the lowest-spending group (Atrius).

Atrius had the lowest adjusted total medical spending PMPY at \$4,528, which was 25% lower than spending at Partners HealthCare and 12% lower than the average amongst these provider organizations.

The four organizations with the highest adjusted spending are anchored by academic medical centers (AMCs). The two organizations with the lowest adjusted spending are both physician-led organizations.

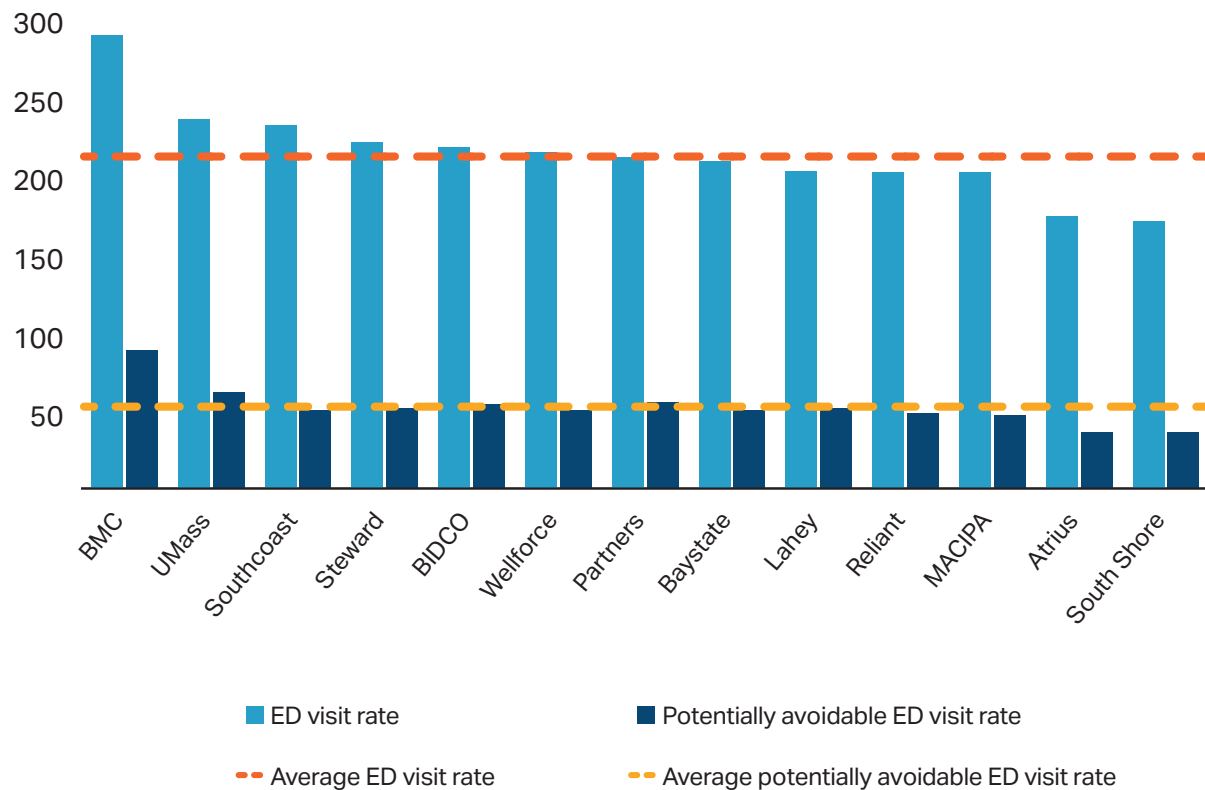
Differences in unadjusted spending were greater than differences in adjusted spending, ranging from \$6,335 (Partners HealthCare) to \$4,144 (Reliant).

NOTES: PMPY: Per member per year. Prescription drug spending and non-claims-based spending excluded. Spending results are for commercial attributed adults (N=865,340). Adjusted results are adjusted for differences in age, sex, health status, and community-level variables related to education and socioeconomic status. See technical appendix for more details.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2017

# TOTAL AND POTENTIALLY AVOIDABLE ED UTILIZATION

Adjusted visits per 1,000 attributed commercial patients, 2017



Overall ED utilization and potentially avoidable ED utilization may indicate inefficient use of acute care resources, in addition to opportunities to improve access to primary care, urgent care, and other community resources.

Across all provider organizations, the adjusted commercial ED utilization rate was 211 ED visits per 1,000 patients. ED utilization varied by 70% among provider organizations, from the highest among patients attributed to PCPs affiliated with Boston Medical Center (288) to the lowest among patients attributed to PCPs affiliated with South Shore Health (170).

The percentage of ED visits in this population classified as potentially avoidable varied from 21% to 31% across provider organizations. The average rate of potentially avoidable visits was 52 per 1,000 patients, with a range across provider organizations between 36 (Atrius and South Shore Health) and 88 (Boston Medical Center) potentially avoidable visits per 1,000 patients per year.

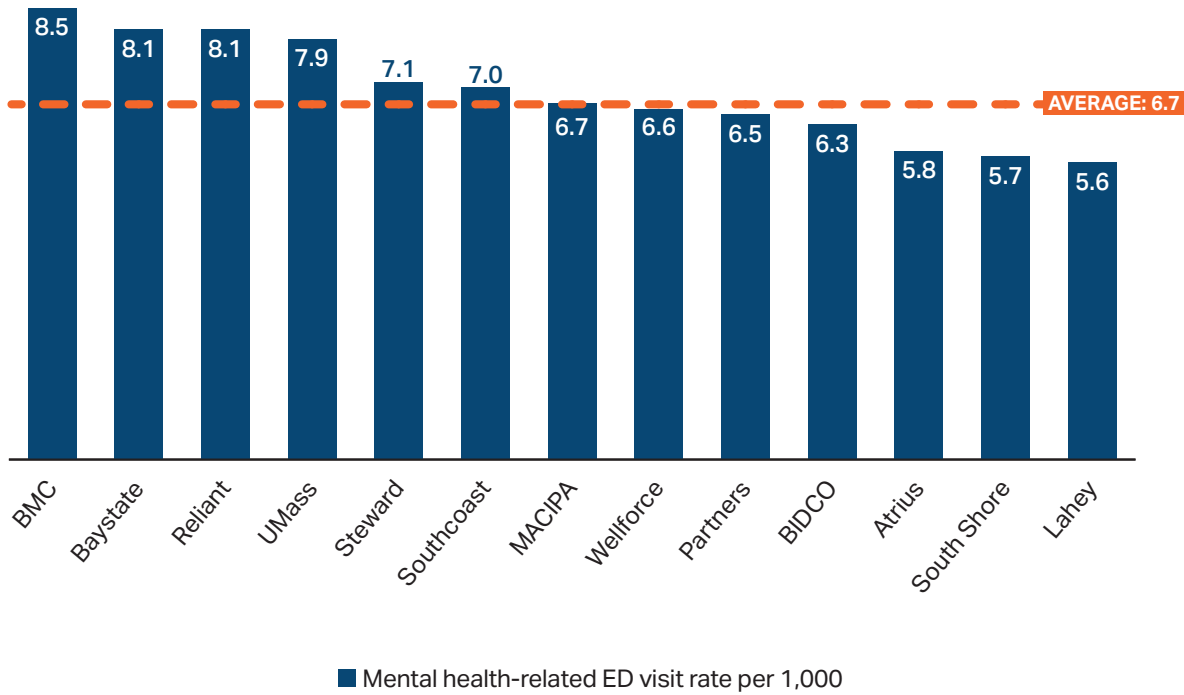
Notes: Potentially avoidable ED visits are based on the Billings algorithm. Results reflect commercial attributed adults, at least 18 years of age (N=865,340). Results are adjusted for differences in age, sex, health status, and community-level variables related to education and socioeconomic status. See technical appendix for details.

Sources: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2017



# MENTAL HEALTH-RELATED ED UTILIZATION

Adjusted visits per 1,000 attributed commercial patients, 2017



Mental health-related ED utilization can be a signal of poor access to outpatient behavioral health care, as some patients may seek care in the ED if they cannot access appropriate community-level care.

The adjusted rate of mental health-related ED utilization was 52% higher for patients attributed to Boston Medical Center relative to patients attributed to Lahey Health.

The average number of mental health-related ED visits among commercially insured adults with at least one such visit was 1.33 visits per patient per year.

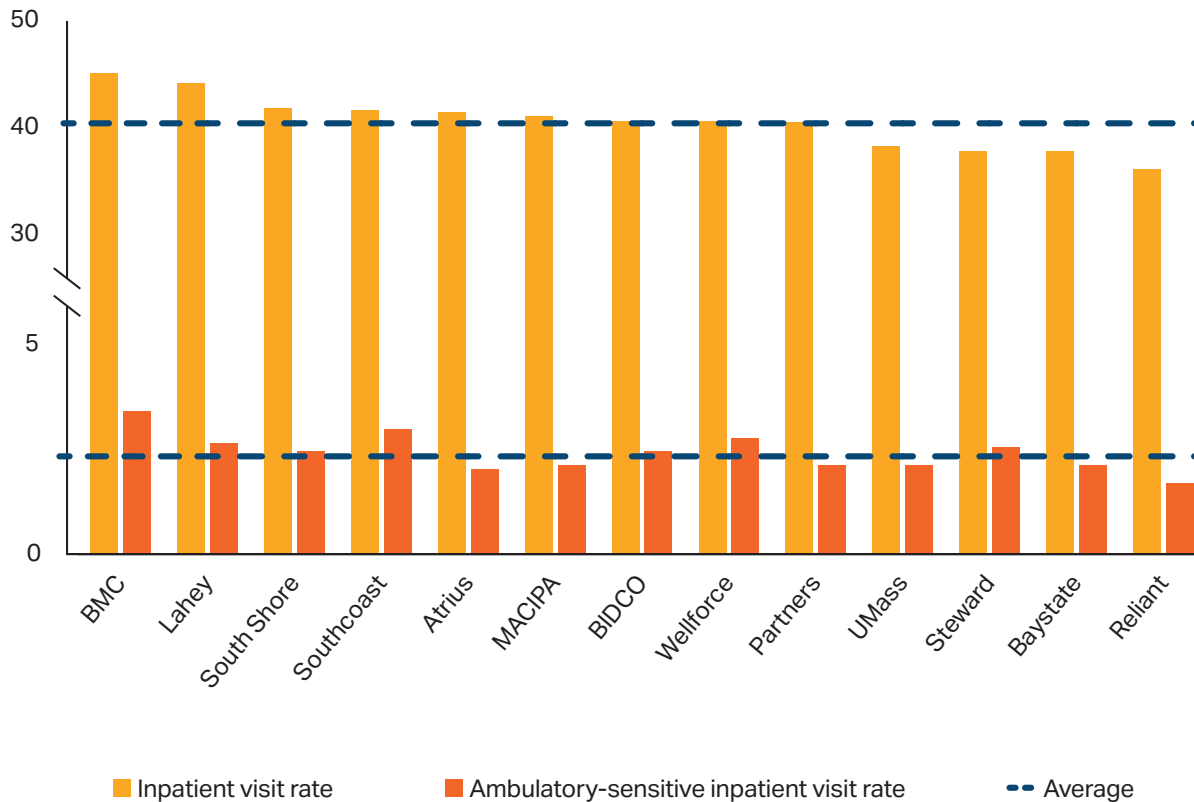
Notes: Mental health-related ED visits are identified using Clinical Classifications Software (CCS). Results reflect commercial attributed adults, at least 18 years of age (N=865,340). Results are adjusted for differences in age, sex, health status, and community-level variables related to education and socioeconomic status. See technical appendix for details.

Sources: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2017

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# TOTAL AND AMBULATORY-SENSITIVE INPATIENT UTILIZATION

Adjusted stays per 1,000 attributed commercial patients, 2017



Overall inpatient utilization did not vary as strongly across provider groups, ranging from 45 inpatient visits per 1,000 patients attributed to Boston Medical Center to 36 visits per 1,000 patients attributed to Reliant.

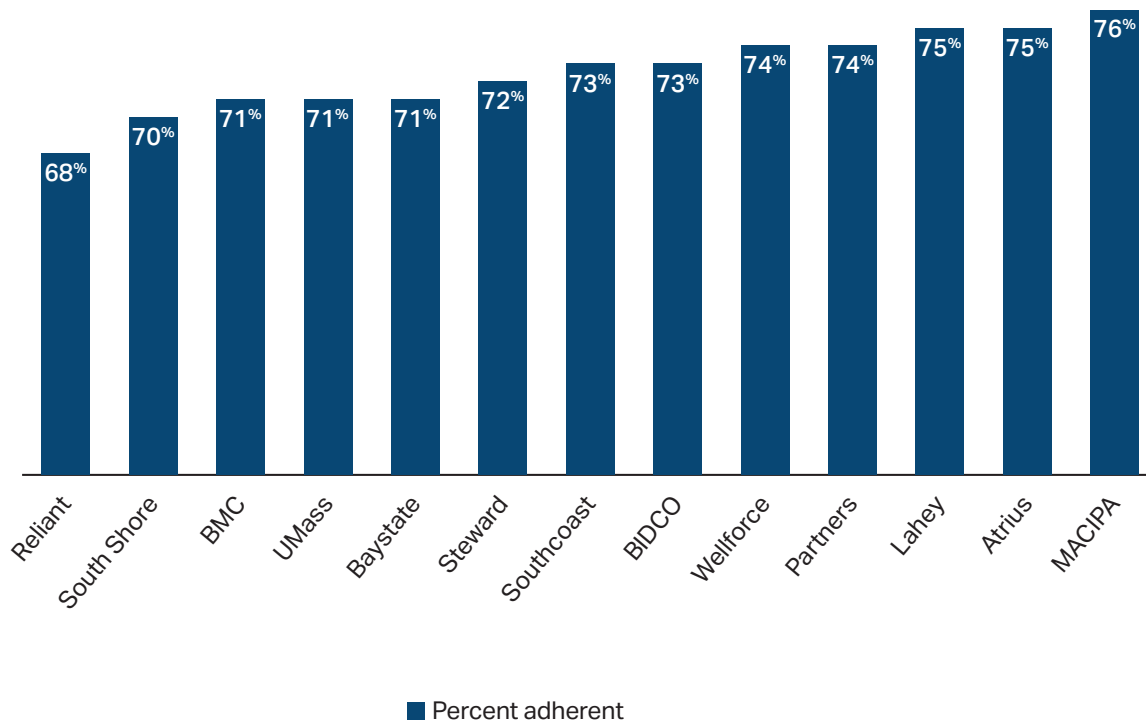
Certain inpatient visits are identified as potentially preventable through ambulatory care management. Although a relatively small proportion of inpatient visits, these rates identify areas for improvement in primary care delivery and community supports.

The variation in ambulatory-sensitive inpatient visit rates was much larger than the variation in overall inpatient visit rates. The rate of ambulatory-sensitive inpatient visits varied by 93% between organizations.

Notes: Ambulatory-sensitive inpatient visits are identified using Agency for Health Research and Quality's (AHRQ) Prevention Quality Indicators. Results reflect commercial attributed adults, at least 18 years of age (N=865,340). Results are adjusted for differences in age, sex, health status, and community-level variables related to education and socioeconomic status. See technical appendix for details.

Sources: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2017

# MEDICATION ADHERENCE: STATINS FOR COMMERCIAL PATIENTS WITH CARDIOVASCULAR DISEASE



Adherence to prescribed medication is necessary to ensure that the clinical benefits of the prescription are achieved. Medication adherence is particularly important for optimal management of chronic conditions. Provider organizations can influence adherence through patient reminders, patient education, and portals that facilitate refills.<sup>1</sup>

The HPC evaluated adherence among patients with cardiovascular disease who filled at least one prescription for a statin in 2017. Adherence is defined as a patient filling prescriptions that would cover at least 80% of days in the observation period.

The average rate of medication adherence was 73% across these provider organizations in Massachusetts. In 2017, performance on this measure nationally was approximately 74% for commercially-insured patients.<sup>2</sup>

1 Costa, Elsie et al. "Interventional tools to improve medication adherence: review of literature." Patient preference and adherence vol. 9 1303-14. 14 Sep. 2015.

2 "Statin Therapy For Patients With Cardiovascular Disease and Diabetes." National Committee for Quality Assurance. 1 Dec 2019. Available at: <https://www.ncqa.org/hedis/measures/statin-therapy-for-patients-with-cardiovascular-disease-and-diabetes/>

NOTES: Study population includes commercial adults with a cardiovascular disease diagnosis code and claims for at least one statin prescription. Results are adjusted for differences in age, sex, health status, and community-level variables related to education and socioeconomic status. See technical appendix for more details.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2017

# INTRODUCTION

## LOW VALUE CARE

Low value care (LVC) refers to medical services recognized by clinicians as not based on evidence and typically unnecessary. Previous analyses by the HPC included in the 2018 Cost Trends Report identified prevalence, variation, and cost of 19 measures of LVC across five domains (screening, pre-operative, procedures, imaging, and pharmacy) for commercially-insured patients included in the Massachusetts All-Payer Claims Database (APCD) from 2013-2015.<sup>1</sup>

In this analysis, the HPC expands and updates reporting on LVC with seven measures across three domains (screening, pre-operative, and procedures), using newly available commercial claims data for 2017 and reconstruction of measures to reflect the transition from the ICD-9 to ICD-10 coding systems. These seven measures were selected based on recently published literature, relatively high prevalence and spending in commercial populations, ability to be captured using APCD claims data, and availability of specifications using ICD-10 codes. Two measures (vitamin D screening and spinal injections for lower back pain) were included in the previous analysis. Specific codes and sources for all measures can be found in the **Technical Appendix** of this report.

These measures do not capture the full extent of LVC in the Commonwealth, but are illustrative of the prevalence of such care, the variation in care, and the associated spending in the Massachusetts commercial population.

<sup>1</sup> Massachusetts Health Policy Commission. 2018 Cost Trends Report. February 2019. Available at: <https://www.mass.gov/doc/2018-report-on-health-care-cost-trends/download>

# LOW VALUE CARE HIGHLIGHTS, 2017

## LOW VALUE SERVICES STUDIED

### SCREENING

T3 (Thyroid) screening for patients with hypothyroidism

Cardiac stress testing for patients with an established diagnosis of ischemic heart disease or angina

Vitamin D screening for patients without chronic conditions

### PRE-OPERATIVE TESTING

Baseline labs in patients without significant systemic disease undergoing low-risk surgery

Chest radiograph for patients undergoing noncardiothoracic low-risk surgery

### PROCEDURES

Spinal injections for lower back pain

Coronary stent for patients with an established diagnosis of ischemic heart disease or angina



**\$13 MILLION**

TOTAL SPENDING ON EVALUATED  
LVC SERVICES



**101,516**

TOTAL # OF PATIENTS WITH AT  
LEAST 1 LVC SERVICE



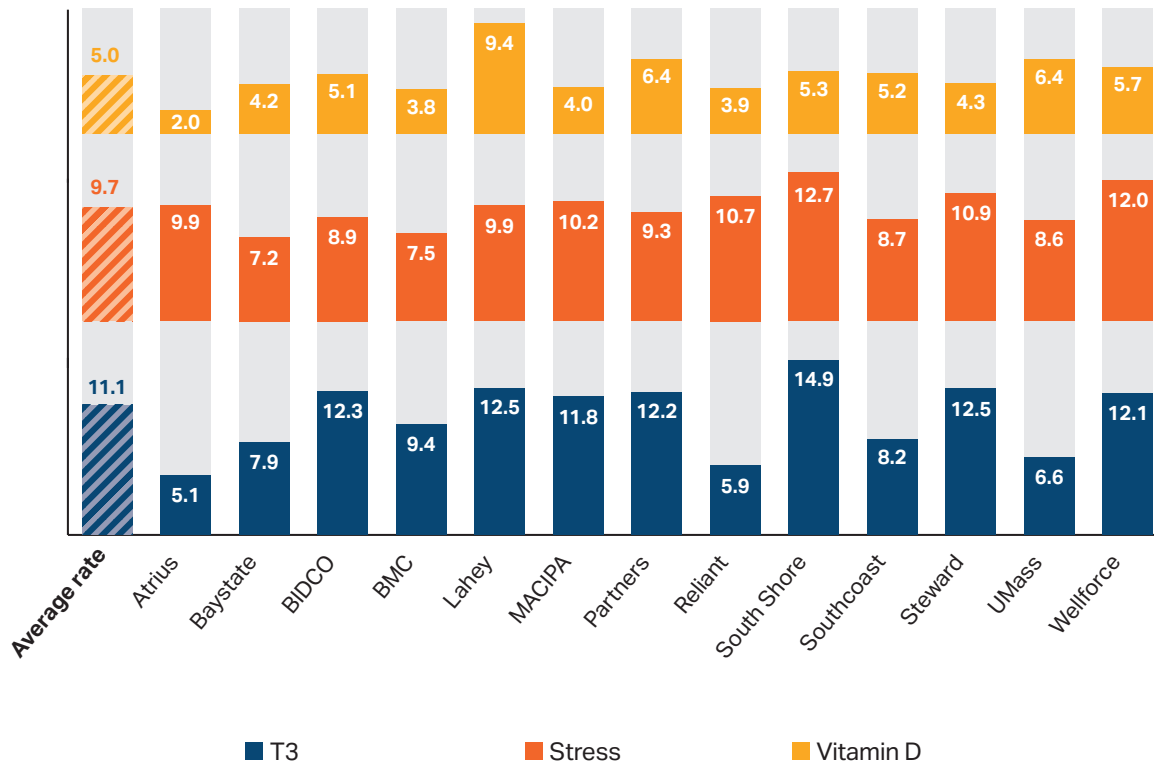
**163,532**

TOTAL # OF LVC  
SERVICES IDENTIFIED

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# LOW VALUE SCREENINGS: T3 (THYROID), CARDIAC STRESS, AND VITAMIN D

Low value screenings per 100 eligible commercial patients, 2017



Notes: T3 = Total or free T3 level measurement in a patient with a hypothyroidism diagnosis during the year; Stress = Stress testing for patients with an established diagnosis of ischemic heart disease or angina at least 6 month before the stress test, and thus not done for screening purposes; Vitamin D = Population based screening for 25-OH-Vitamin D deficiency. Based on a patient's medical history and inclusion criteria for each low value measure, a patient could be counted in multiple measures. Average reflects rate for all commercial patients, including patients not attributed to a listed provider organization. See technical appendix for details.

Sources: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2017

Previous work identified screenings as the most prevalent category of LVC received in Massachusetts.

The rates of low value screenings for patients attributed to the largest provider organizations reflect 61,424 low value encounters across 58,804 patients in 2017. These low value screenings account for \$5.4 million in spending.

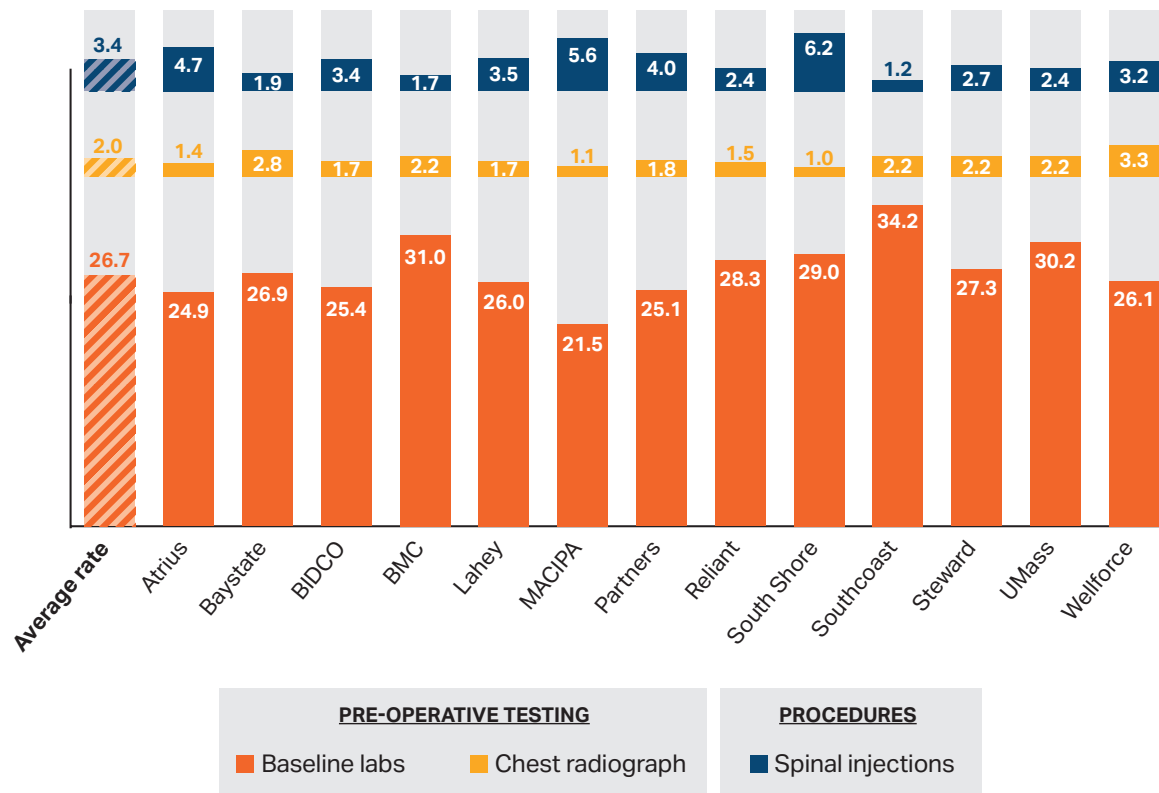
Patients attributed to South Shore Health had the highest rate of low value T3 tests, 2.9 times the rate for patients attributed to Atrius. Patients attributed to South Shore Health also had 1.8 times the rate of stress tests compared to patients attributed to Baystate.

Notably, since the HPC last reported on LVC, the rate of vitamin D screenings has declined by 70%, from 16.5 screenings per 100 patients in 2015 to 5.0 screenings per 100 patients in 2017. Nonetheless, vitamin D screenings among these provider organizations still accounted for \$3.5 million in low value spending in 2017.

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# LOW VALUE PRE-OPERATIVE TESTING AND PROCEDURES

Low value pre-operative tests and procedures per 100 eligible commercial patients, 2017



19% of eligible patients undergoing a low-risk surgery received at least one low value baseline lab test (some patients received multiple lab tests, resulting in a rate of 26.7 lab tests per 100 eligible patients). Average spending per eligible patient for low value baseline lab tests was \$12. Total spending on low value baseline labs was \$1.2 million.

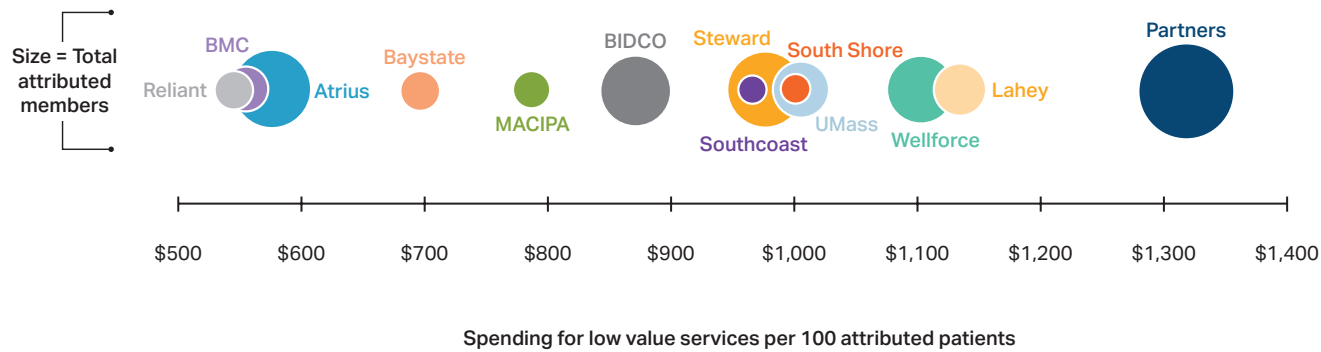
Low value chest radiographs were less common, with only 1.8% of eligible patients receiving this low value service.

Spinal injections for individuals with lower back pain were also less common, with only 1.7% of eligible patients receiving this low value service, but the spending per injection and the number of injections that were administered per encounter amounted to a higher total spending at \$2.2 million. There was approximately five-fold variation between the organization with the highest (South Shore Health) and lowest (Southcoast) rates.

Notes: Baseline labs = Baseline labs in patients without significant systemic disease undergoing low-risk surgery; Chest radiograph = Chest radiographs occurring less than 30 days before a low or intermediate risk non-cardiothoracic surgical procedure (not associated with inpatient or emergency care). Based on a patient's medical history and inclusion criteria for each low value measure, a patient could be counted in multiple measures. Results for the low value stent procedure are not presented by provider organization due to small numbers at some organizations. Average reflects rate for all commercial patients, including patients not attributed to a listed provider organization. See technical appendix for details.

Sources: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2017

# SPENDING FOR SEVEN LOW VALUE SERVICES PER 100 ATTRIBUTED PATIENTS AND TOTAL ATTRIBUTED PATIENTS BY PROVIDER ORGANIZATION, 2017



LVC spending per 100 patients reflects both the number of low value services received and the price paid per service. Reliant had the lowest low value spending per 100 patients at \$547. Partners HealthCare low value spending per 100 patients was the highest at \$1,319, 141% higher than Reliant.

In this exhibit, the size of the circle is proportional to the total number of patients attributed to each provider organization. Provider organizations are arranged based on low value spending per 100 attributed patients. Spending reflects both the number of low value services per patient and the average price of those services, which vary considerably across provider organization. For example, average spending for a vitamin D test was \$89 for a patient attributed to Partners HealthCare, but \$51 for a patient attributed to Reliant.

Notes: Low value spending across all seven measures was summed by provided organization and then divided by the total number of commercial adult attributed patients, and reported as a rate per 100 patients.

Sources: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2017









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