2022

HEALTH CARE COST TRENDS REPORT AND POLICY RECOMMENDATIONS

CHARTPACK

MASSACHUSETTS
HEALTH POLICY COMMISSION

SEPTEMBER 2022

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COMMERCIAL PRICE TRENDS

KEY FINDINGS

COMMERCIAL PRICE TRENDS

- From 2018 to 2020, prices for procedures and services included in the study grew by 3.2% in physician offices, 7.1% in hospital outpatient departments (HOPDs) and 7.9% in hospital inpatient settings.[1]

- Total spending per inpatient discharge grew 4.3% in 2019 and 7.0% in 2020 (12% across the two years) driven by higher prices for a given type of discharge and increases in coding acuity. Length of stay increased only 3% across the two-year period. Payments per discharge from 2018 to 2020 increased for all major categories of stay examined including obesity procedures (9.6%), major joint replacements (10.6%), digestive disorders (13.5%) and psychoses (15%).

- Payment rates varied by hospital ranging from $15,662 (Lawrence General) to $24,865 (Mass General Hospital) for C-section deliveries and from $24,989 (Lowell General) to $47,106 (Brigham and Women's Hospital) for major joint replacements. This degree of variation was similar to that observed in 2018.

- Emergency department (ED) evaluation and management visits reflect higher acuity, which may be a result of patient mix, coding practices (shift towards higher-acuity, higher-paying visits), or both.

- Prices at HOPDs for common procedures and labs were often double the amount paid for the same services performed in physician offices.

- Prices for common HOPD services such as mammography, GI endoscopy and colonoscopy varied, often substantially, by hospital, in some cases by a factor of more than two, with the highest prices generally occurring at academic medical centers and geographically isolated hospitals (e.g., Falmouth and Cape Cod).

- A market basket price index for HOPD services showed that academic medical centers, specialty hospitals (Children's Hospital and Dana Farber Cancer Institute) and geographically isolated hospitals (e.g., Martha's Vineyard, Nantucket and Falmouth hospitals) had the highest HOPD prices in the state. The cost of a market basket of common HOPD services varied from $43,213 (Martha's Vineyard Hospital) to $17,208 (Holyoke).

- Higher-priced hospital systems also tended to have faster price growth between 2018 and 2020; thus, price variation between hospitals increased over this time period.

1 Hospital inpatient growth actually refers to "payment" growth as all services that could be considered occurring during an inpatient stay were attributed to that final "payment" amount. For more detail see Technical Appendix.

INTRODUCTION

COMMERCIAL PRICE TRENDS

While prices for health care services in Medicare and Medicaid are set administratively by government bodies, prices in the commercial market are determined through negotiations between payers and providers. Because the leverage that different payers and providers have in those negotiations varies considerably, commercial prices vary – far more than prices paid by government payers.[1]

Commercial prices are also considerably higher than Medicare and Medicaid prices – often by a factor of two or more – and are therefore also often twice as high as the costs of providing care.[2] These trends likely reflect gains in provider market power relative to payers through vertical (e.g. physician-hospital) and horizontal (e.g. hospital-hospital) consolidation, which increases provider negotiating leverage.[3, 4] Researchers have found little, if any, relationship between commercial prices and quality of care.[5]

As the HPC has documented in past work, inpatient and outpatient spending growth has been driven by commercial price increases.[6]

This work builds on last year's Price Chartpack with the addition of a new methodology using a price index to compare commercial hospital outpatient department (HOPD) prices for common HOPD services across hospitals and payers throughout the state and over time.

This Chartpack focuses on commercial price trends in Massachusetts from 2017 or 2018 to 2020 for roughly 1.5 million commercially-insured members with medical claims in the All-Payer Claims Database (MA APCD) covered by BCBSMA, THP, HPHC, AllWays or Anthem. See technical appendix for more details.

Terminology note: *We use "price" to refer to the reimbursement level for an office or HOPD service. We use "payment" to refer to the total reimbursement for an inpatient stay, since a stay may include multiple services and the set of services may not be consistent across all inpatient stays. All prices and payments included in this Chartpack represent estimates based on observed payments to providers across payers within the MA APCD and do not necessarily represent negotiated prices in contract between a specific payer and provider.*

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1 Chernew ME, Hicks AL, Shah SA. Wide State-Level Variation In Commercial Health Care Prices Suggests Uneven Impact Of Price Regulation: An examination of state-level price variation in the commercial market, relative to Medicare, for a broader set of states and a wider set of services than had been previously examined. Health Aff (Millwood). 2020 May 1;39(5):791–9.

2 Kaiser Family Foundation, Lopez, Eric, Tricia Neuman, Gretchen Jacobson, and Larry Levitt. "How much more than Medicare do private insurers pay? A review of the literature." (2020).

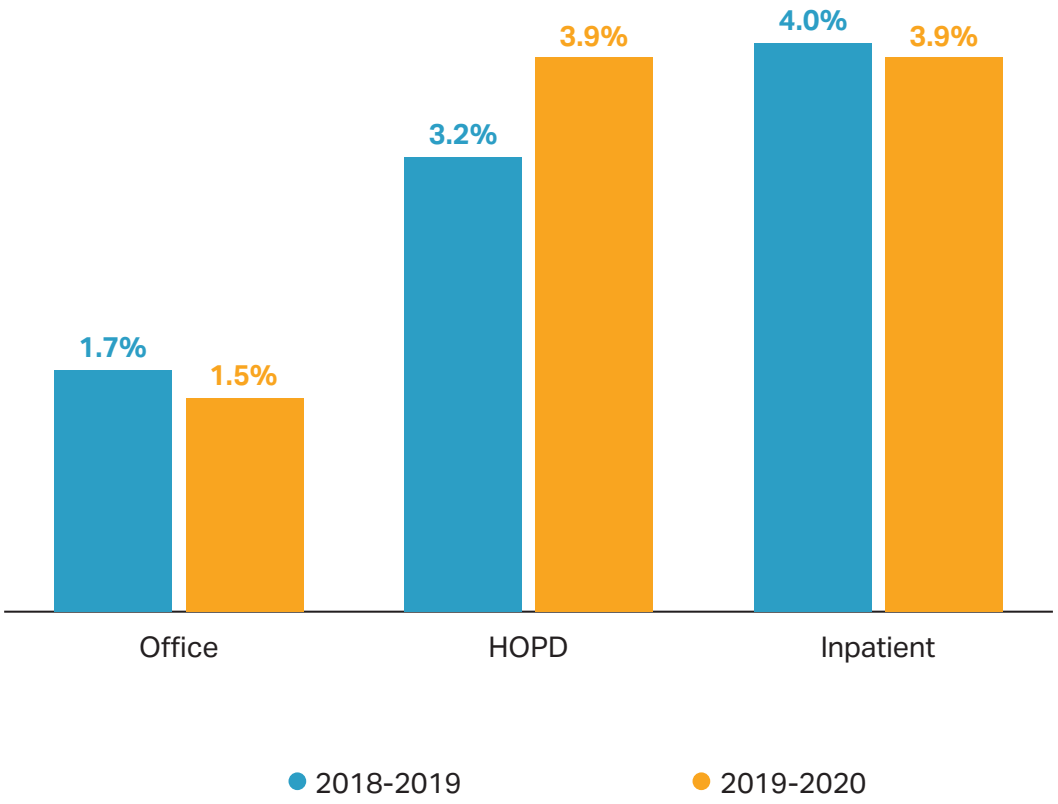
3 Cooper Z, Craig SV, Gaynor M, Van Reenen J. The Price Ain't Right? Hospital Prices and Health Spending on the Privately Insured*. Q J Econ. 2019 Feb 1;134(1):51–107.

4 Fulton BD. Health Care Market Concentration Trends In The United States: Evidence And Policy Responses. Health Aff (Millwood). 2017 Sep;36(9):1530–8.

5 Roberts ET, Mehrotra A, McWilliams JM. High-Price And Low-Price Physician Practices Do Not Differ Significantly On Care Quality Or Efficiency. Health Aff (Millwood). 2017 May;36(5):855–64.

6 Massachusetts Health Policy Commission 2019 Cost Trends Report.

ANNUAL PERCENTAGE INCREASE IN AGGREGATE PRICES BY SETTING, 2018–2020



NOTES: Price growth includes both facility and professional spending. Price growth is computed at the level of a procedure code encounter. Procedure code encounters are defined as the same person, same date of service, same procedure code to capture the potential for both facility and professional claims billed on the same day for the same service based on the setting. The inpatient stay "growth" is more accurately considered payment, rather than price growth. Payment growth for inpatient stays include all services provided during the hospital stay. Only procedure codes that were billed in both 2018 and 2020 were included. Procedures codes with < 20 services or < $1,000 in aggregate spending in 2018 and 2020 were excluded. HOPD spending increase does not match HOPD index due to differences in methodology.

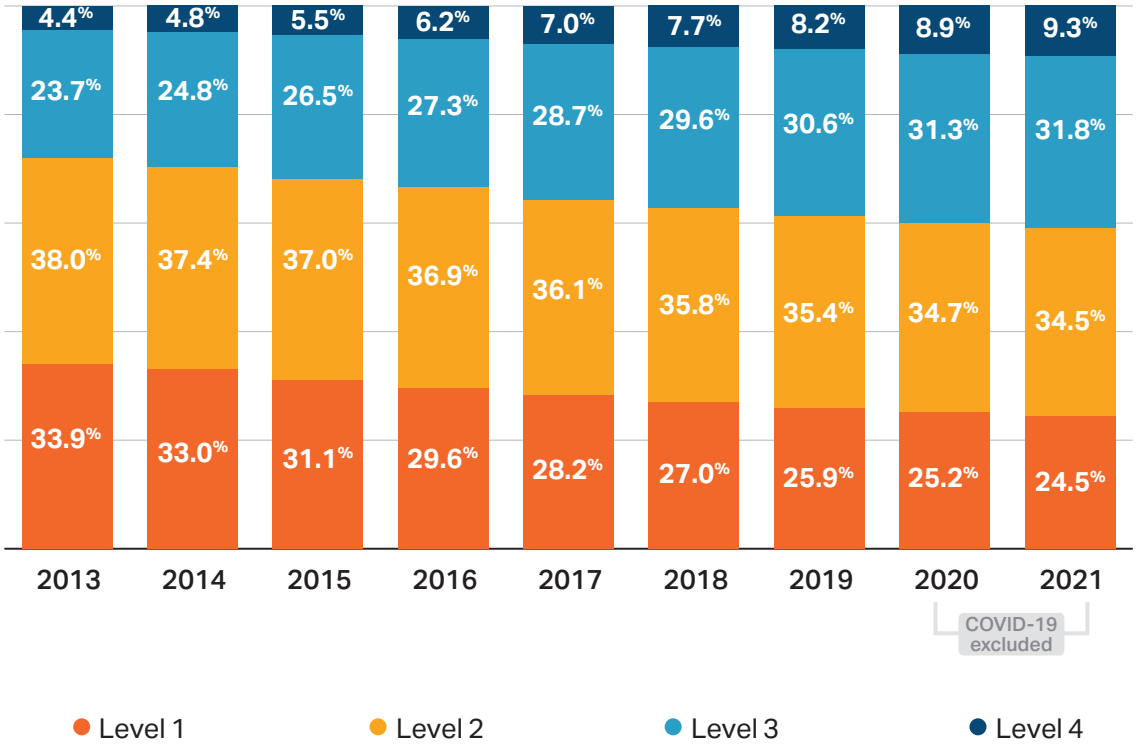
SOURCES: HPC analysis of the All-Payer Claims Database, 2018-2020, V 10.0.

- This figure shows annual price growth per encounter by setting, including both facility and professional spending, where applicable. Inpatient payment growth includes all services provided during an inpatient stay.
- Price growth was substantially higher in HOPD and inpatient settings in both 2019 and 2020 than in office settings. Notably, aggregate price growth in the HOPD and inpatient settings exceeded the benchmark.
- In 2020, price growth increased by more than half a percentage point in HOPD settings and remained relatively steady in office and inpatient settings.

INPATIENT PAYMENT TRENDS

COMMERCIAL PRICE TRENDS

PROPORTIONAL COMPOSITION OF INPATIENT DISCHARGES BY PATIENT SEVERITY OF ILLNESS, COVID-19 CASES EXCLUDED, 2013–2021

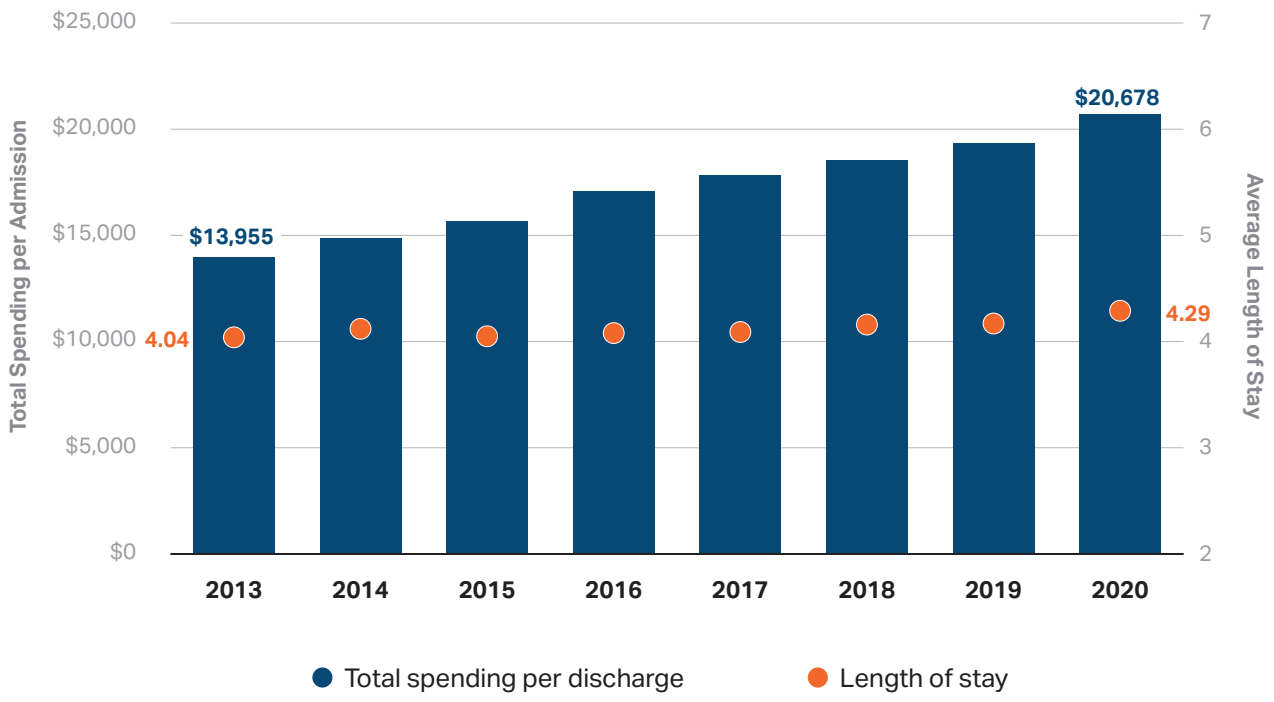


NOTES: Data from the Massachusetts Hospital Inpatient Discharge Database (HIDD) from 2013-2021. Severity groups and typical payment amounts were defined using MassHealth (Medicaid) all-payer refined diagnosis related groups (APR-DRG) and patient severity of illness (SOI) on a four-level severity scale, with 4 being the highest acuity. The data is comprised of all medical inpatient stays at acute care hospitals for Massachusetts residents, excluding behavioral health stays and extremely long length of stay because these cases are usually not paid on a DRG basis. Other exclusions include transfers, patients who died, patients who went to Shriners Hospital for Children (Springfield and Boston), and discharges with some APR coding restrictions based on discrepancies with CMS major diagnostic categories. COVID-19 cases were defined as any inpatient stay with U071 for the primary or secondary diagnosis code.

SOURCES: HPC analysis of Center for Health Information and Analysis Hospitals Inpatient Discharge Database, FY2013-2019, preliminary FY2020-2021

- Coded severity of inpatient stays continued to increase in 2021. The proportion of inpatient stays coded at the highest level of acuity grew to 9.3% in 2021, up from 4.4% in 2013. Meanwhile, the proportion of stays coded at the lowest level of severity dropped to 24.5% in 2021, from 33.9% in 2013.
- 2019 payments from a typical payer ranged from roughly $6,600 for a typical level 1 stay to $39,000 for a typical level 4 stay.

TOTAL INPATIENT SPENDING PER COMMERCIAL DISCHARGE AND AVERAGE LENGTH OF STAY FOR COMMERCIAL HOSPITAL STAYS, 2013–2020

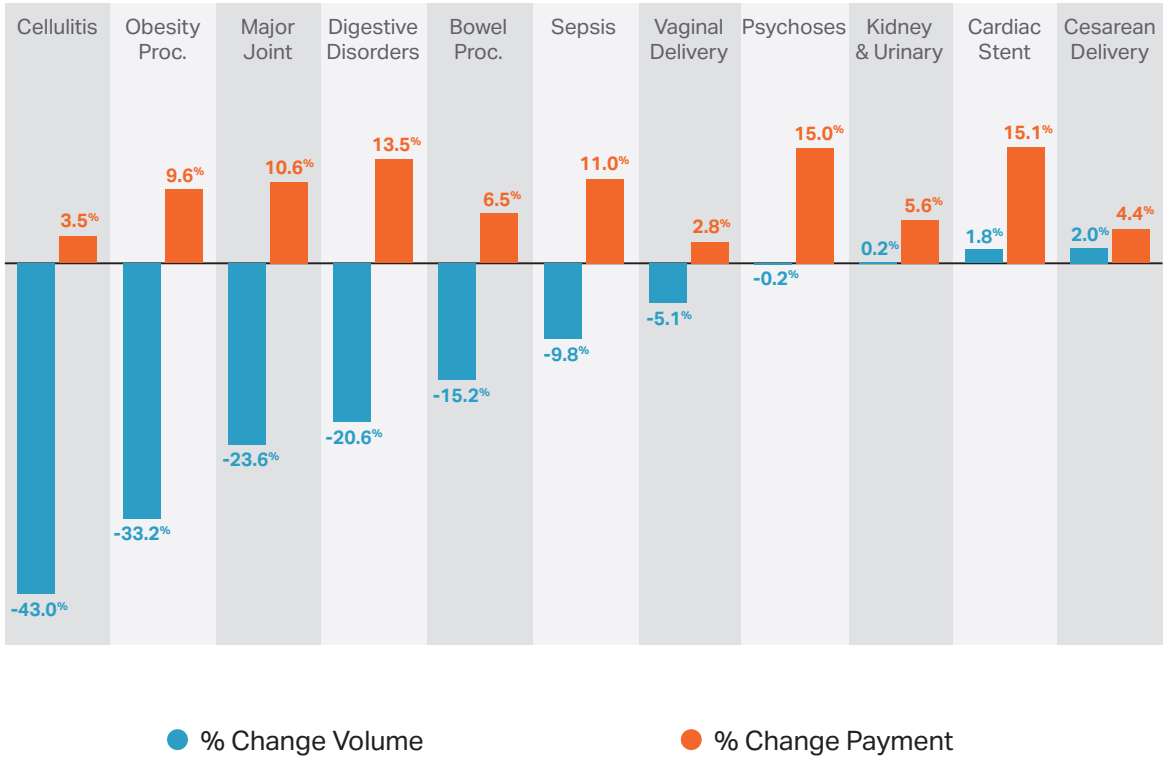


NOTES: Only includes acute care inpatient discharges. Certain discharges were excluded from the analysis including transfers, rehabilitation stays, those from Shriner's Hospital, and those with length of stay (LOS) more than 180 days.

SOURCES: CHIA Hospital Inpatient Discharge Data, 2013-2020 (volume and LOS). Spending data are derived from full and partial-claims commercial spending by category for 2016-9 and full claims only from 2013-6 (based on data availability) from the Massachusetts Center for Health Information and Analysis' Annual reports from 2013-2022.

- Overall, commercial spending per hospital discharge increased 48% from 2013 to 2020, while length of stay increased 6% over this time period.
- In 2020, total commercial inpatient hospital spending in Massachusetts decreased 2% to $4.1 billion from 2019, while the number of commercial inpatient stays decreased by 8%, to 197,000.
- Although the number of hospital discharges decreased in 2020, spending per discharge increased from $19,322 in 2019 to $20,678 in 2020, a 7% increase. Total spending per inpatient discharge grew 4.3% in 2019.
- Findings from the HPC's 2019 Annual Cost Trends Report showed that growth in payments per discharge is roughly evenly divided between higher prices for a given type of discharge and growth in the acuity of those discharges; and that the growth in acuity per discharge is, in turn, driven by changes in hospital coding practices more than actual changes in patient health.

CHANGE IN PAYMENTS AND VOLUME FOR SELECT HIGH-VOLUME TYPES OF INPATIENT DISCHARGES, COVID-19 DIAGNOSES EXCLUDED, 2018–2020

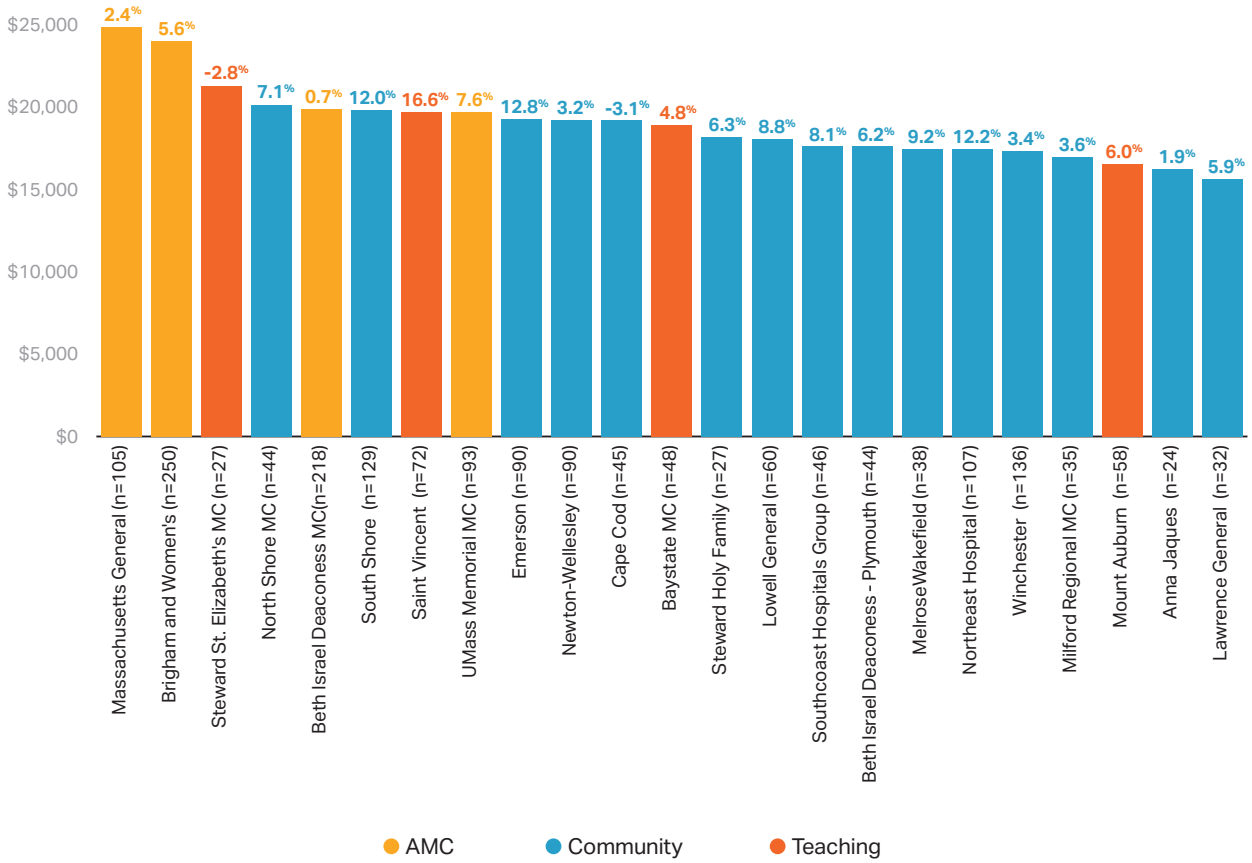


NOTES: Average payment shown includes both facility and professional claims for an inpatient stay collapsed across severity levels for a DRG-stay (e.g, with and without major complexity or comorbidity). To account for changes in payment or volume that may be related to coding within a type of inpatient stay (e.g., more major joint replacements coded as "with complications"), DRGs that differed only by severity classification were grouped together. Vaginal delivery includes MS-DRGs 774 and 775. Major hip and knee joint replacement includes MS-DRG 469 & 470. Cesarean section delivery includes 765 and 766. Sepsis includes MS-DRG 871 and 872, but not 870 (with mechanical ventilation). Obesity procedures includes MS-DRGs 619-621. Cellulitis includes MS-DRGs 602 and 603. Psychoses only includes MS-DRG 885. Digestive disorders include MS-DRGs 391 and 392. Carotid artery stent includes MS-DRG 246-247. Volume is adjusted for total member months in each year.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, v10 2018-2020

- Overall commercial inpatient discharge volume was 8.3% lower in 2020 than 2018 for the 11 conditions studied; however, the change in volume varied substantially by condition.
- Increases in payment per discharge were seen for all DRGs examined, but particularly for psychoses (from $14,819 per discharge in 2018 to $17,035 per discharge in 2020) and carotid artery stents (from $38,083 per discharge in 2018 to $43,826 per discharge in 2020).
- When including discharges with COVID-19 diagnoses, most results did not change appreciably except for sepsis. Including COVID-19 diagnoses, sepsis cases had a 6.1% increase in volume and a 15.8% increase in average payment.

VARIATION IN AVERAGE PAYMENTS: CESAREAN SECTION DELIVERY (WITHOUT COMPLICATIONS) BY HOSPITAL, 2020, WITH PERCENTAGE CHANGE IN AVERAGE PAYMENT FROM 2018–2020

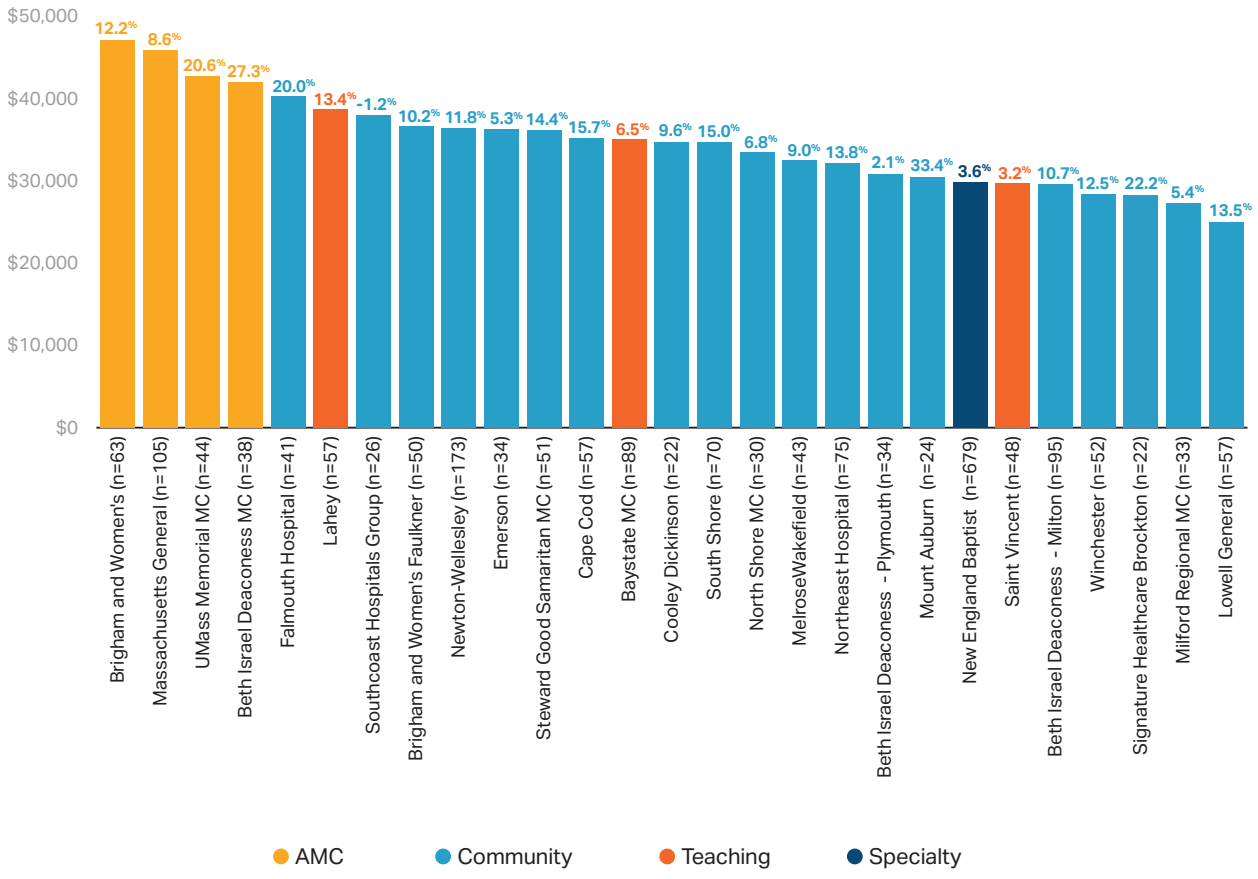


- The average payment for a cesarean delivery varied by 58.8% -- from a low of $15,662 at Lawrence General Hospital to a high of $24,865 at Massachusetts General Hospital.
- Payment growth from 2018 to 2020 varied widely by hospital.

NOTES: Average payment shown includes both facility and professional claims for an inpatient stay. Cesarean section delivery includes 766 and excludes any stays that had a diagnosis of COVID-19. Percent change in average payment by hospital between 2018 and 2020 is listed above each payment bar.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, v10 2018-2020

VARIATION IN AVERAGE PAYMENTS: MAJOR JOINT REPLACEMENT SURGERY (WITHOUT COMPLICATIONS) BY HOSPITAL, 2020, WITH PERCENTAGE CHANGE IN AVERAGE PAYMENT FROM 2018–2020



NOTES: Average payment shown includes both facility and professional claims for an inpatient stay labelled with DRG 470 (major joint replacement without major complication or comorbidity) and without COVID-19. Hospital inclusion criteria was at least 20 inpatient stays in both 2018 and 2020. Percent change in average payment by hospital between 2018 and 2020 is listed above each payment bar.

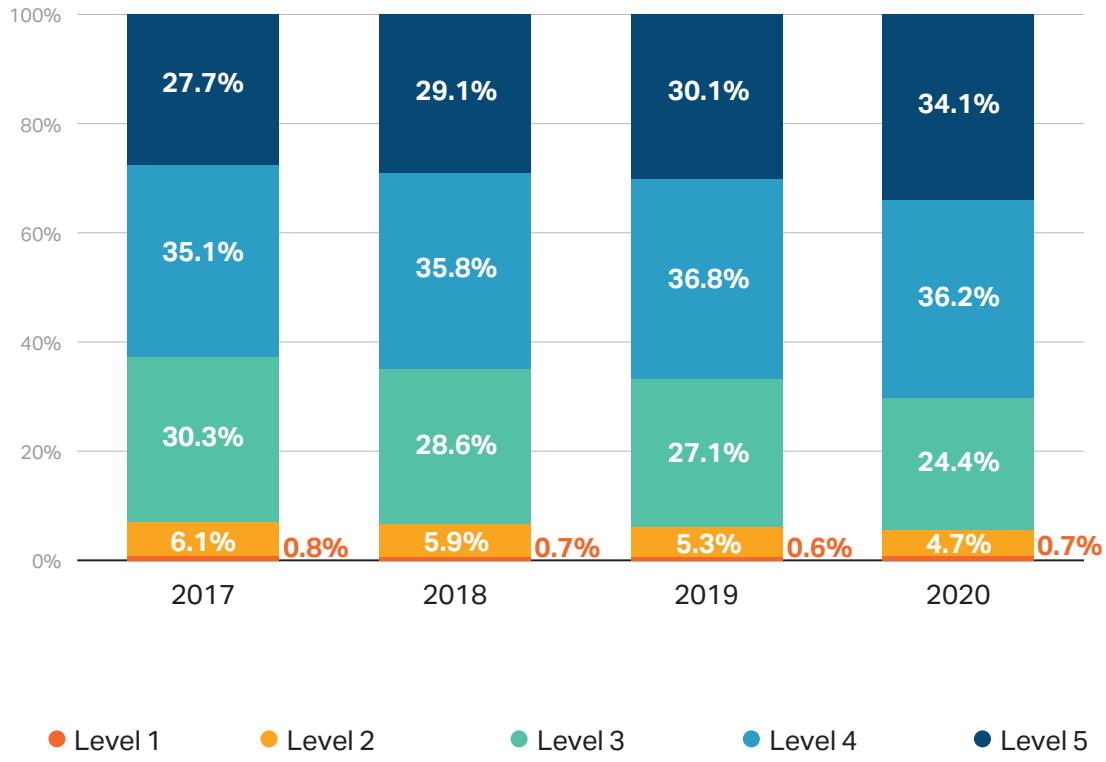
SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, v10 2018-2020

- The average payment for an inpatient major joint replacement varied 88.5% from $47,106 at Brigham and Women's Hospital to $24,989 at Lowell General Hospital.
- As with the HPC's last report examining 2016-2018, New England Baptist (a specialty hospital) had by far the largest volume at 679 inpatient stays in the APCD and one of the lower average payments of $29,788.
- Changes in average payments varied tremendously, from -1% to 33% with over 16 of the 27 hospitals shown having payment increases over 10%.

EMERGENCY DEPARTMENT (ED), OFFICE, AND HOSPITAL OUTPATIENT DEPARTMENT (HOPD) PRICE TRENDS

COMMERCIAL PRICE TRENDS

DISTRIBUTION OF EMERGENCY DEPARTMENT VISITS BY INTENSITY LEVEL, 2017–2020

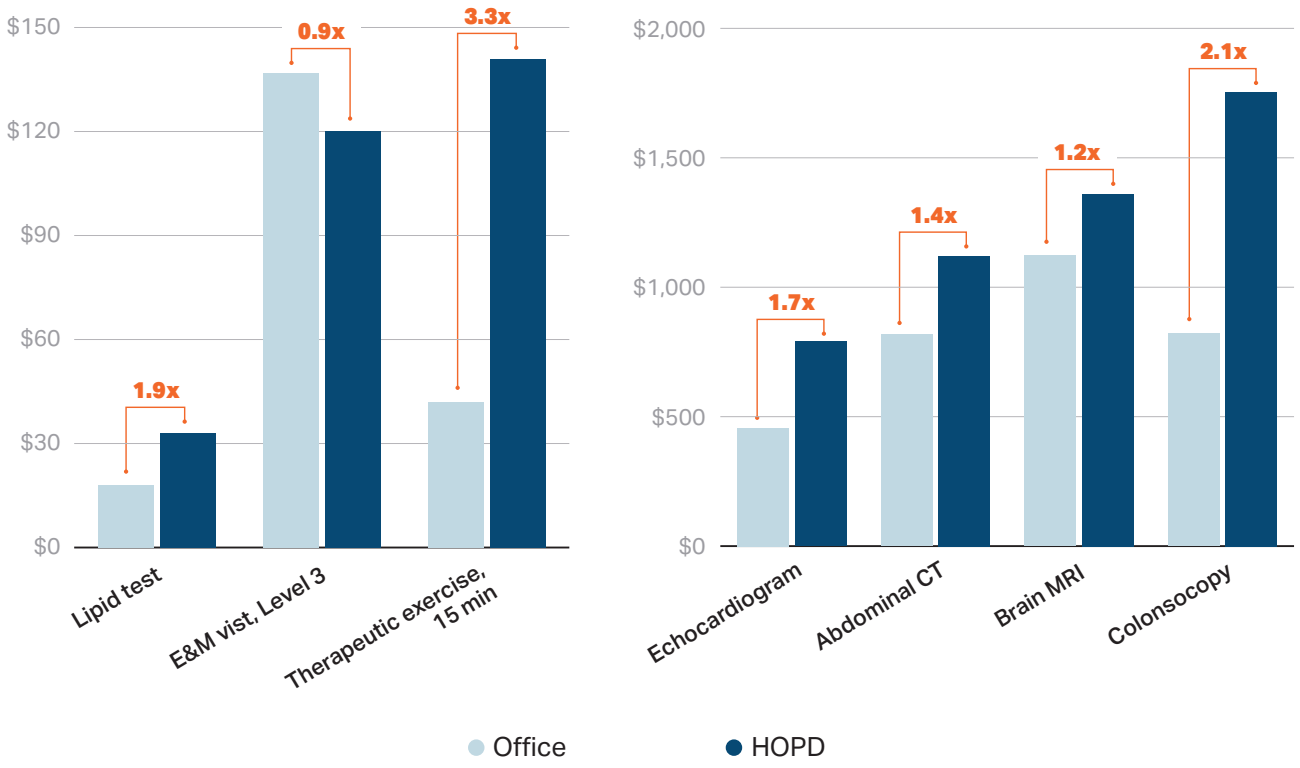


- Emergency department (ED) visits coded at level 5 (99285; highest complexity) have increased as a share of overall visit volume by 6.4 percentage points between 2017 and 2020.
- Level 4 and 5 ED visits accounted for 70.2% of overall commercial ED visit volume in 2020.
- Research from the HPC and others suggests that the shift to higher acuity codes reflects coding practices rather than changes in the patient population overall. One exception to this trend may be in 2020, when the COVID-19 pandemic likely resulted in a relatively greater reduction in low-acuity ED visits than high-acuity visits.

NOTES: ED severity was assigned based on ED procedure code 99281-99285 for the patient encounter. If a member had more than one ED evaluation and management code (99281-99285) on the same day, both were included as a separate 'visit'.

SOURCE: HPC analysis of the All-Payer Claims Database, 2018-2020, V 10.0.

AVERAGE PRICES FOR COMMON AMBULATORY SERVICES BY SETTING, OFFICE OR HOPD, 2020

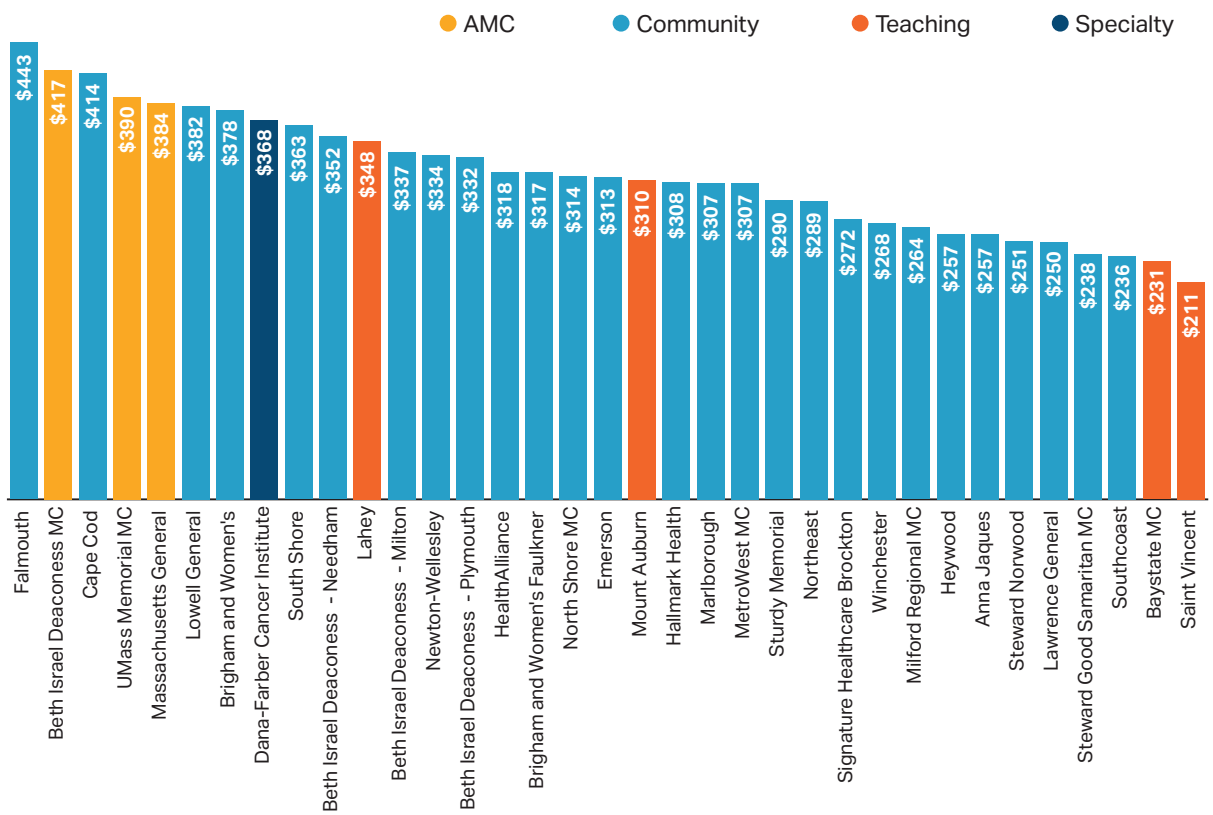


- Many ambulatory services can safely be provided in either physician offices or HOPDs. Some HOPD services cannot safely be performed in an office setting (for example, major procedures). For some other services, the appropriate setting may depend on patient acuity.
- For services (based on procedure code) delivered with sufficient volume in both office and HOPD settings, the HOPD setting was usually more expensive than the office setting for the same service.

NOTES: Services displayed had high aggregate HOPD spending in 2020 and were high volume services in both office and HOPD settings. Prices reflect encounters (same person, same date of service, same procedure code) to capture both facility and professional claims billed on the same day in the HOPD setting that is comparable to professional claims being billed in the office setting. CPT codes for services listed include: Lipid test (80061), Evaluation & Management Visit, Level 3 (99213), Therapeutic exercise, 15 min (97110), Echocardiogram (93306), Abdominal CT (74177), Brain MRI (70553), Colonoscopy (45380).

SOURCES: HPC analysis of the All-Payer Claims Database, 2018-2020, V 10.0.

AVERAGE PRICE OF A MAMMOGRAPHY PERFORMED IN A HOPD, BY HOSPITAL, 2020

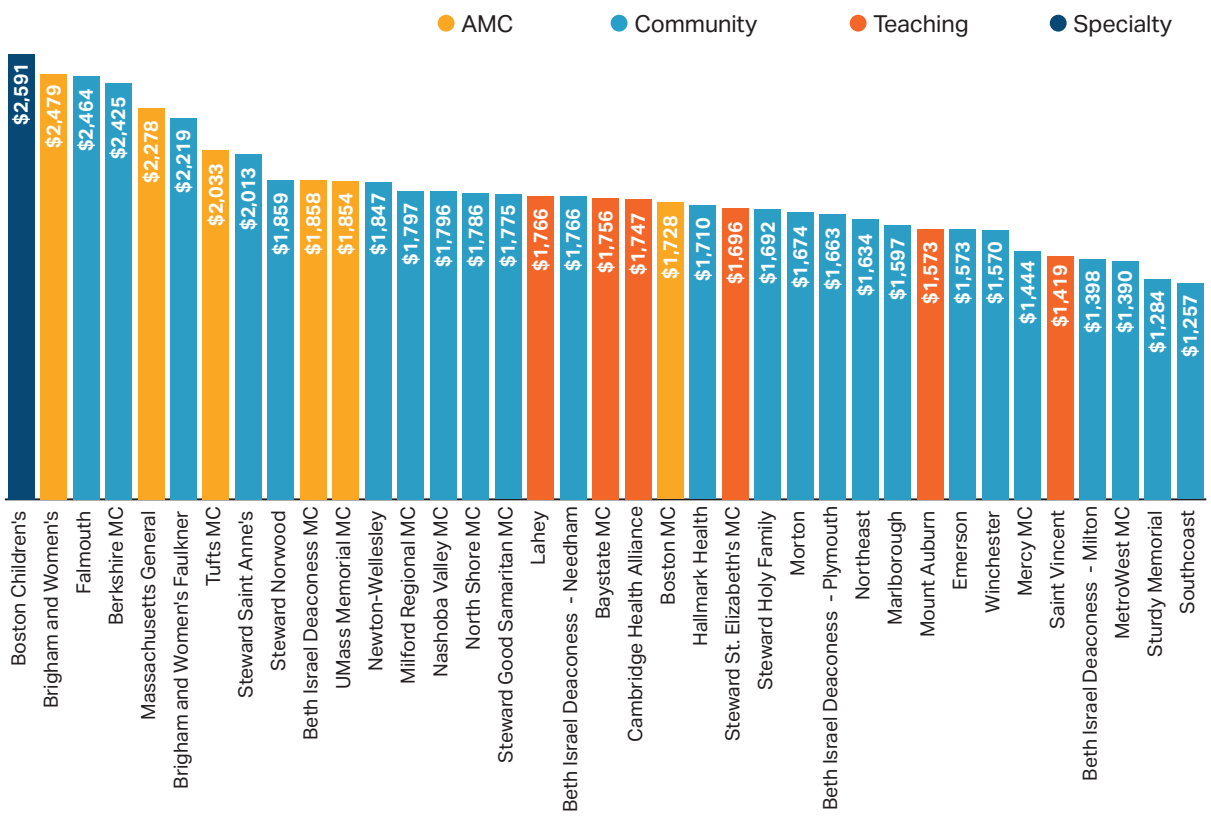


NOTES: Facilities listed are limited to those with at least 700 commercial encounters for the service in 2020. Prices reflect encounters (same person, same date of service, same procedure code) to capture the potential for both facility and professional claims billed on the same day. Mammography (CPT 77067, 'Screening mammography, bilateral, including computer-aided detection (CAD) when performed'). CPT 77067 was newly introduced in 2017 to replace a retiring CPT code, G0202.

SOURCES: HPC analysis of Center for Health Information and Analysis All-Payer Claims Database v10.0, 2020

- Mammography screenings are one of the most common services delivered in the ambulatory care setting.
- Among HOPDs that provide a high volume of mammography screenings, the price for a mammography at the most expensive provider (Falmouth Hospital, $443) was more than twice as expensive as the lowest-priced provider (Saint Vincent Hospital, $211). HOPDs operated by academic medical centers (AMCs) or geographically isolated hospitals had higher prices on average.
- Most HOPDs had average mammography prices that were higher than the average price of the service when delivered in an office setting ($271).

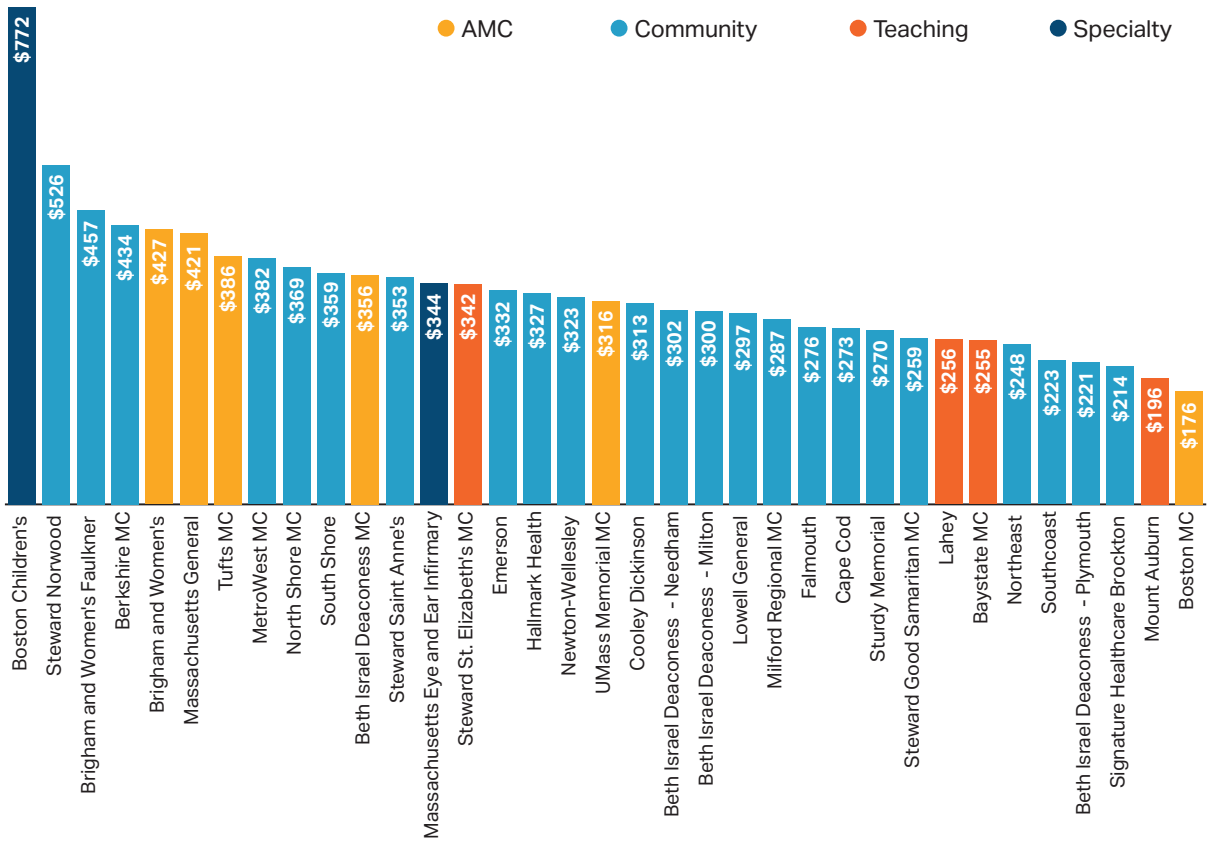
AVERAGE PRICE OF A COLONOSCOPY PERFORMED IN A HOPD, BY HOSPITAL, 2020



NOTES: Facilities listed are limited to those with at least 50 commercial encounters delivered in 2020. Prices reflect encounters (same person, same date of service, same procedure code) to capture the potential for both facility and professional claims billed on the same day. Prices for services paid under global payment arrangements or other non-fee-for-service methods are not included in the calculation of average price. Colonoscopy (CPT 45380, 'Colonoscopy, flexible; with biopsy, single or multiple').
Sources: HPC analysis of Center for Health Information and Analysis All-Payer Claims Database v10.0, 2020

- Among HOPDs that provide a high volume of colonoscopies, the price for a colonoscopy at the most expensive HOPD (Boston Children's Hospital, $2,591) was more than twice that of the least expensive HOPD provider (Southcoast, $1,257) in 2020.
- In 2020, the average price for a colonoscopy performed in a HOPD was $1,754, 2.1 times more expensive than the average price for a colonoscopy performed in an office ($822).
- Boston Children's Hospital (BCH), a specialty pediatric hospital, is included in this exhibit (and in the following two exhibits) along with general acute hospitals, because BCH performs these procedure with sufficient volume to meet inclusion criteria.

AVERAGE PRICE OF A SURGICAL PATHOLOGY SERVICE PERFORMED IN A HOPD, BY HOSPITAL, 2020

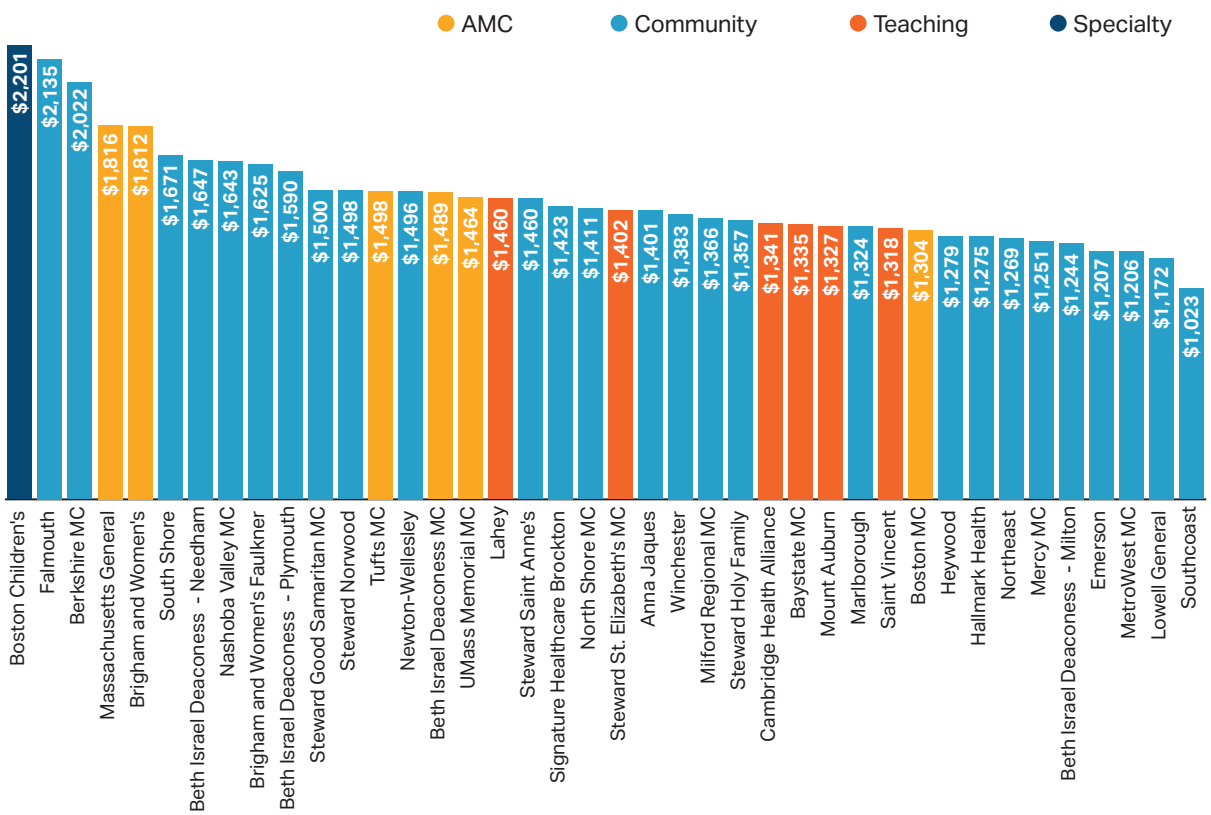


NOTES: Facilities listed are limited to those with at least 400 commercial encounters delivered in 2020. Prices reflect encounters (same person, same date of service, same procedure code) to capture the potential for both facility and professional claims billed on the same day. Prices for services paid under global payment arrangements or other non-fee-for-service methods are not included in the calculation of average price. Data are for surgical pathology (CPT 88305, 'Level IV Surgical pathology, gross and microscopic examination').

SOURCES: HPC analysis of Center for Health Information and Analysis All-Payer Claims Database v10.0, 2020

- Among HOPDs that provide a high volume of surgical pathology examinations, the price for this service at the most expensive HOPD (Boston Children's Hospital, $772) was 4.4 times that of the least expensive HOPD provider (Boston Medical Center, $176) in 2020.
- In 2018, the average HOPD price for this service was $289, 27% more expensive than the average office-based price ($228).

AVERAGE PRICE OF GI ENDOSCOPY PERFORMED IN A HOPD, BY HOSPITAL, 2020



NOTES: : Facilities listed are limited to those with at least 50 commercial encounters delivered in 2020. Prices reflect encounters (same person, same date of service, same procedure code) to capture the potential for both facility and professional claims billed on the same day. GI endoscopy (CPT 43239, 'Esophagogastroduodenoscopy'). Prices for services paid under global payment arrangements or other non-fee-for-service methods are not included in the calculation of average price.

SOURCES: HPC analysis of Center for Health Information and Analysis All-Payer Claims Database v10.0, 2017-2020

- Among HOPDs that provide a high volume of GI endoscopies, the price for this service at the most expensive HOPD (Boston Children's Hospital, $2,201) was 2.2 times as expensive than the lowest cost HOPD (Southcoast Hospitals Group, $1,023) in 2020.
- The average HOPD price in 2018 for GI endoscopy was $1,427, 2.1 times the average office-based price ($666).

HOSPITAL OUTPATIENT DEPARTMENT (HOPD) COMMERCIAL PRICE INDEX

COMMERCIAL PRICE TRENDS

INTRODUCTION

HOPD COMMERCIAL PRICE INDEX: A MARKET BASKET APPROACH FOR EVALUATING COMMERCIAL PRICE TRENDS

- HOPD spending represents a large and growing proportion of commercial spending in Massachusetts – currently the largest single spending category. The heterogenous service mix in this setting can pose challenges for summarizing price levels and growth over time in a meaningful way.

- The HPC developed a fixed-quantity market basket[1] to allow for comparisons of prices over time and across payers and providers. The service mix (both in terms of types of services and relative quantities) is constant over time and across entities to isolate changes in price as a driver of spending growth.

- The market basket contains the 50 highest-cost HOPD services in terms of aggregate statewide spending that also meet a minimum volume threshold (using 2018 volume data). The services are defined by procedure code encounters, and the prices include spending from both associated professional and facility claims.

- All prices included in this index represent estimates based on observed payments to providers across payers within the MA APCD and do not necessarily represent negotiated prices in contract between a specific payer and provider.

1 A fixed-quantity market basket is also referred to as a Laspeyres price index, a commonly used index in economics. The Consumer Price Index (CPI) is an example of a commonly used Laspeyres index. See the Technical Appendix for information on the methodology in greater detail.

TOP 10 SERVICES IN THE HOPD MARKET BASKET BY OVERALL SPENDING, 2018

CPT	Procedure code description	Number of HOPDs with adequate volume	Statewide spending, 2018	Average price, 2018	Volume per 100 members per year	Total spending for 100 patients at average hospital	Weight of the service in the basket
77067	Screening mammography, bilateral, including CAD when performed	57	$29,769,530	$290	6.4	$1,863	8.1%
45380	Colonoscopy, flexible; with biopsy, single or multiple	53	$28,381,588	$1,718	1.1	$1,843	8.0%
45385	Colonoscopy with polypectomy	53	$24,110,934	$1,880	0.8	$1,521	6.6%
88305	Surgical pathology (Level IV), gross and microscopic examination	56	$22,899,980	$303	4.8	$1,464	6.4%
99214	Evaluation and Management visit - 45 minutes	56	$20,987,216	$184	7.8	$1,441	6.3%
43239	Esophagogastrodudenoscopy ('GI Endoscopy')	56	$18,975,394	$1,474	0.8	$1,211	5.3%
45378	Colonoscopy, flexible; diagnostic, including collection of specimen(s) by brushing or washing, when performed	50	$16,482,558	$1,576	0.7	$1,044	4.6%
74177	CT Abdomen/Pelvis; with Contrast	53	$15,543,457	$1,191	0.9	$1,030	4.5%
93306	Transthoracic echocardiography (TTE) w/doppler complete	53	$14,615,646	$1,135	0.8	$925	4.0%
97110	Physical therapy, 15 minutes	57	$13,882,467	$139	6.3	$874	3.8%

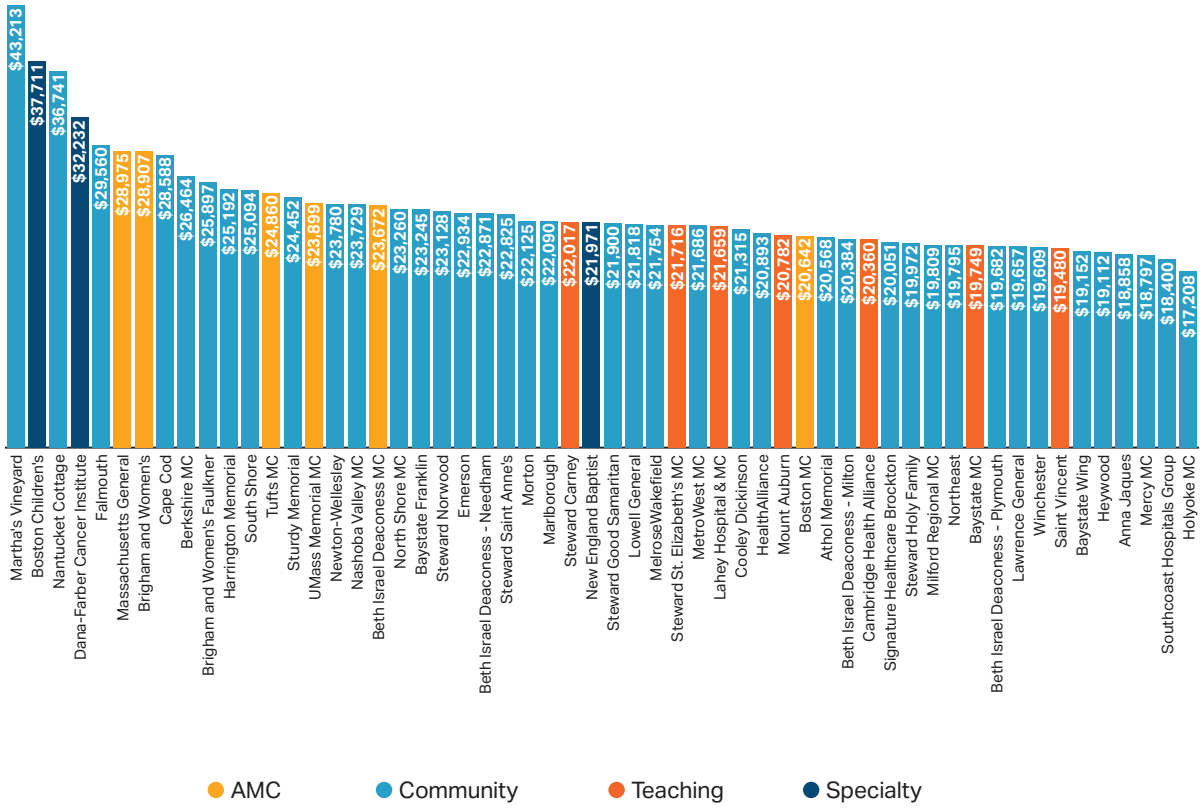
40 remaining services not shown. See Technical Appendix.

NOTES: Contents of market-basket, top 10 services based on statewide spending in 2018. Item weights are calculated by multiplying the volume (per 100 members per year) by the average price of a procedure encounter and then summing across all 50 services in the index. Two hospitals (VA Medical Center and Shriners Hospital) were excluded from the analytic dataset due to very small overall service volumes. Outpatient encounters from 58 identifiable hospital outpatient departments are ultimately included in the subsequent analyses.

SOURCES: HPC analysis of Center for Health Information and Analysis All-Payer Claims Database, 2018-2020, V 10.0.

- The market basket services were identified empirically to establish a representative service mix (e.g., lower and higher priced services, different clinical areas, etc.) that can be used to summarize HOPD spending.
- The final basket includes the 50 highest aggregate spending HOPD services with at least 20 annual service encounters each for at least 50 HOPDs in Massachusetts. These 50 services accounted for approximately 39% of statewide HOPD volume and 17% of HOPD spending in 2018.
- The average statewide cost of the full market basket is $22,922 in 2018 (50 individual services with unique procedure codes, with quantities of each service scaled to represent volume per 100 members per year).

COST OF THE HOPD MARKET BASKET BY HOSPITAL, 2020

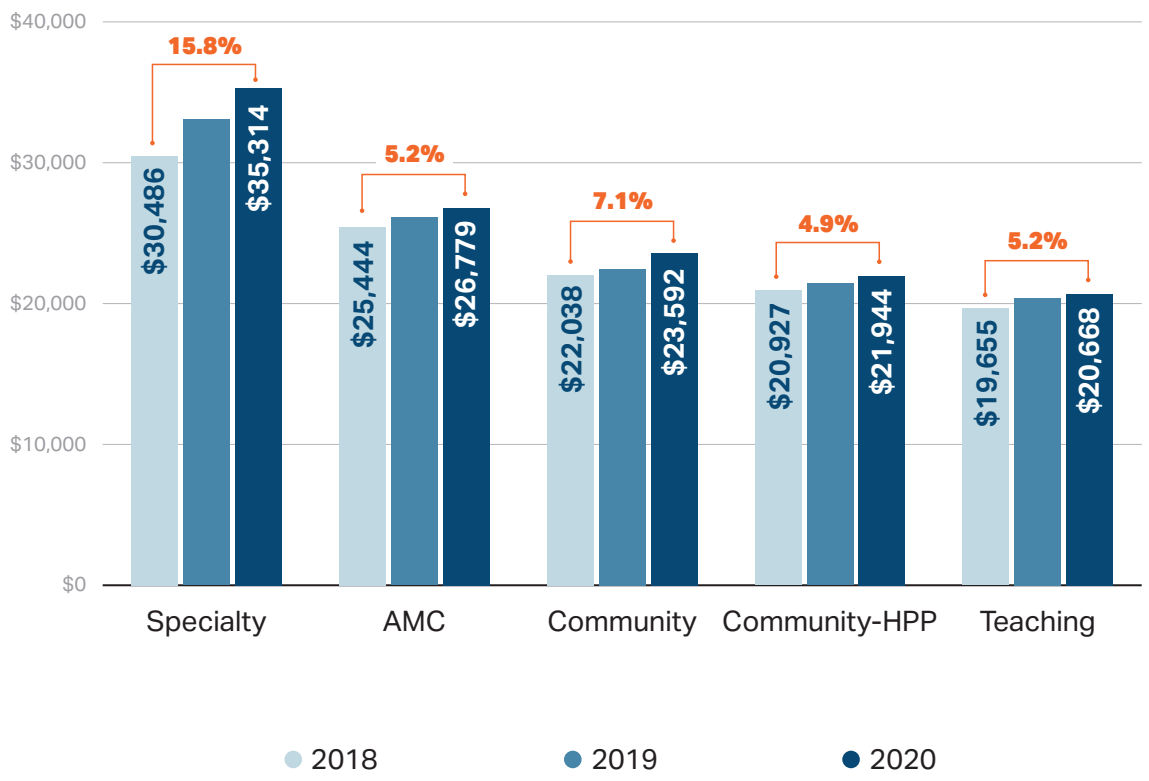


NOTES: Academic medical center (AMC). For each hospital, the same 50 procedure codes are evaluated using a fixed statewide volume (computed using 2018 data) and hospital-specific mean service prices in 2020 for each procedure code. Hospitals with fewer than 20 service encounters for any individual procedure code have imputed values (statewide mean price) for that procedure code and are not included if more than 20 procedure codes would have to be imputed. See technical appendix for more details on methodology.

SOURCES: HPC analysis of Center for Health Information and Analysis All-Payer Claims Database, 2018-2020, V 10.0.

- The cost of the HOPD market basket in 2020 varied more than 2:1 across hospitals throughout the state, with higher price levels identified among academic medical centers (AMCs), specialty hospitals, and geographically isolated hospitals.
- The cost to provide this set of services per 100 members per year ranged from $43,213 at Martha's Vineyard Hospital to $17,208 at Holyoke Hospital.

COST OF THE HOPD MARKET BASKET BY HOSPITAL COHORT, 2018–2020

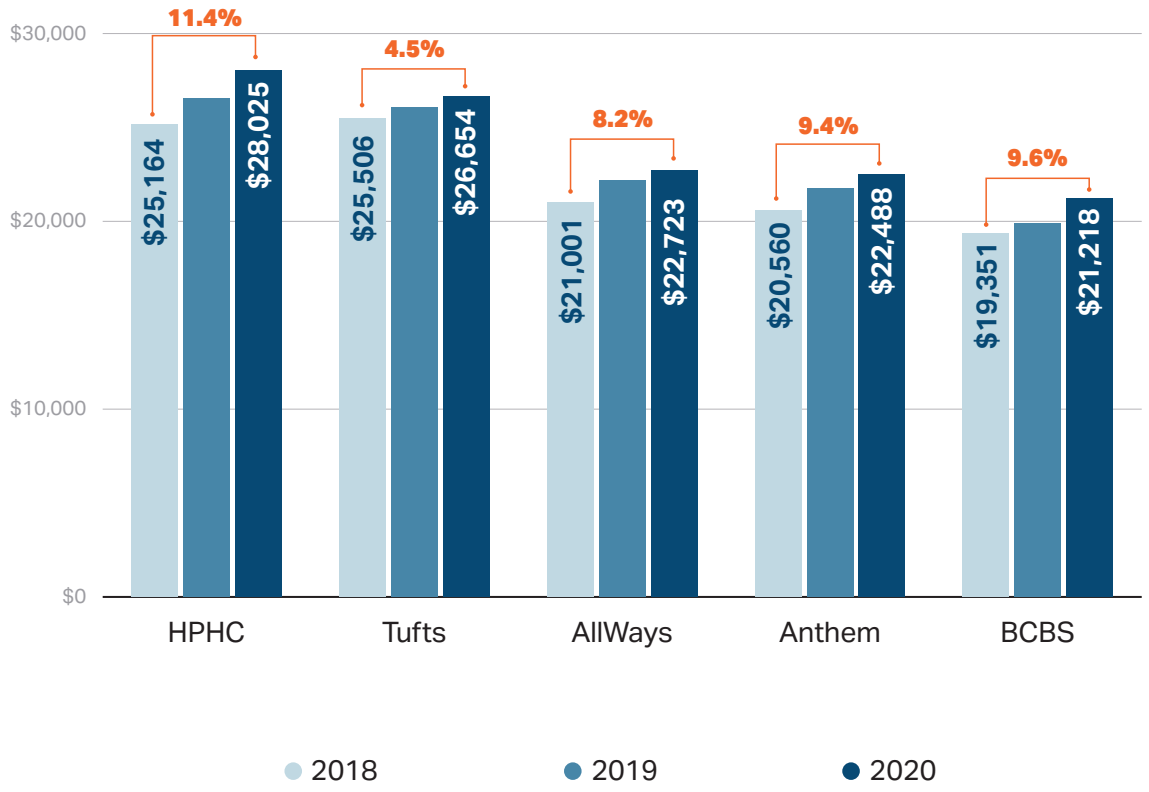


NOTES: Hospital cohorts are sourced from CHIA's 2018 hospital profiles; some hospitals may be in different cohorts as of 2020. AMC=Academic Medical Center, and includes Beth Israel Deaconess Medical Center, Boston Medical Center, Brigham and Women's Hospital, Tufts Medical Center, Massachusetts General Hospital, UMass Memorial Medical Center, and Nashoba Valley Medical Center. Teaching cohort includes Baystate Medical Center, Cambridge Health Alliance, Lahey Hospital & Medical Center, Mount Auburn Hospital, Saint Vincent Hospital, Steward Carney Hospital, and Steward St. Elizabeth's Medical Center. Specialty cohort includes Dana Farber Cancer Institute, Boston Children's Hospital, and New England Baptist Hospital. See CHIA hospital profiles for Community and Community-HPP cohorts.

SOURCES: HPC analysis of Center for Health Information and Analysis All-Payer Claims Database, 2018-2020, V 10.0.

- Prices were highest for specialty hospitals followed by academic medical centers (AMCs). Price growth was highest among specialty hospitals.
- Specialty hospitals were 32% more expensive than AMCs in 2020 and their prices grew 15.8% from 2018 to 2020, about triple the rate of the other hospital cohorts.

COST OF THE HOPD MARKET BASKET BY PAYER, 2018–2020

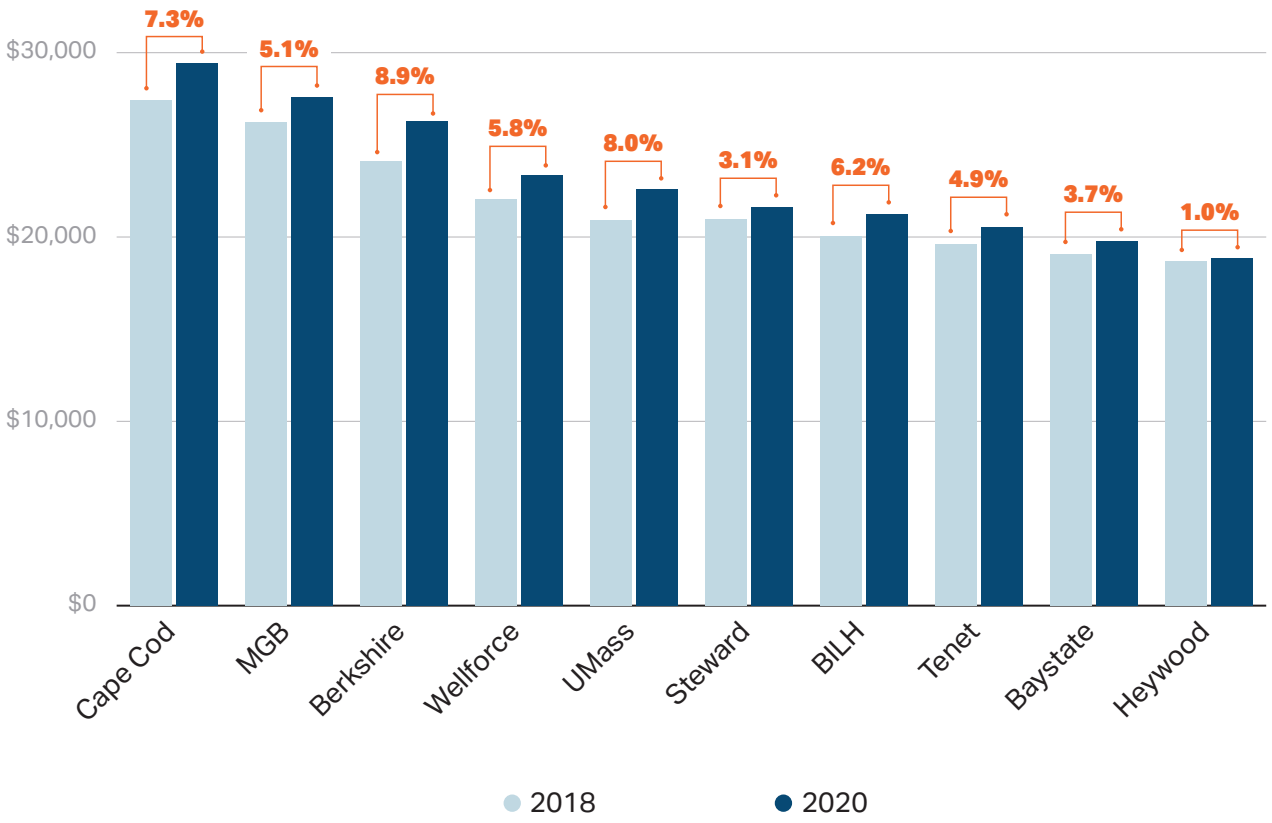


NOTES: (1) HPHC and Tufts merged in January 2021 to form Point32Health. The HPC's version of the APCD includes claims for members enrolled in commercial insurance products from the five payers shown. These claims include most GIC members but otherwise are more heavily representative of members with fully-insured products and overall represent approximately 30% of the commercial market in Massachusetts. For more information on what data can be found in the APCD please see: www.chia-mass.gov/ma-apcd

SOURCES: HPC analysis of Center for Health Information and Analysis All-Payer Claims Database, 2018-2020, V 10.0.

- Prices and price growth also varied by payer. As with hospitals, prices can reflect market leverage of the payer or provider as well as other factors such as broad or narrow networks.
- BCBS' HOPD prices grew 9.6% from 2018 to 2020 but remained the lowest among the five commercial payers in the APCD analyzed by the HPC.
- Harvard Pilgrim Health Care (HPHC) had the highest overall price ($28,025 in 2020) and the highest price growth (11.4% between 2018 and 2020).[1] In 2020, HPHC was 32% more expensive than BCBS, the lowest priced payer.

COST OF THE HOPD MARKET BASKET BY HOSPITAL SYSTEM, 2018–2020

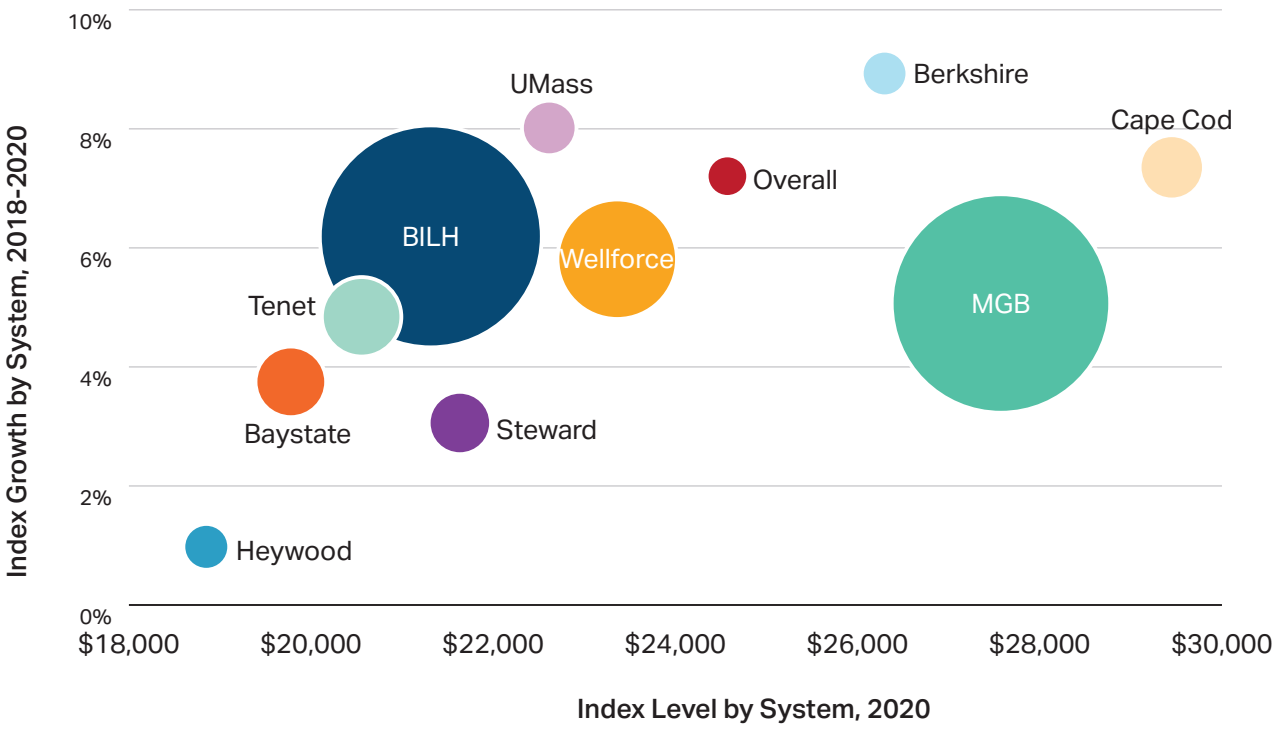


- The cost of the HOPD index by hospital system varied by 56% between the highest cost system (Cape Cod, $29,459) and the lowest cost system (Heywood, $18,845) in 2020. The difference between the lowest and highest cost system increased by 9 percentage points from 2018 to 2020, driven by larger price growth among higher-priced systems.

NOTES: Hospital systems are sourced from CHIA's latest hospital profiles; only systems with multiple acute care hospitals were included in this graphic. 19.9% of index service volume for the 50 CPT codes takes place at hospitals not represented on this graph.

SOURCES: HPC analysis of Center for Health Information and Analysis All-Payer Claims Database, 2018-2020, V 10.0.

COST OF THE HOPD MARKET BASKET BY HOSPITAL SYSTEM, 2020 AND 2018–2020 GROWTH



NOTES: Hospital systems are sourced from CHIA's latest hospital profiles. Bubble size corresponds to percent of index service volume affiliated with each system. 19.9% of index service volume for the 50 CPT codes takes place at hospitals not represented on this graph. "Overall" index growth and index level is based on a weighted average. The 'Overall' data point bubble size is representative only and does not reflect statewide volume.

SOURCES: HPC analysis of Center for Health Information and Analysis All-Payer Claims Database, 2018-2020, V 10.0.

- This figure displays the cost of the market basket in 2020 and growth in the market basket index. Hospital system volume is reflected in the size of the bubble. There is a positive association between systems with higher prices ('index level') and price growth ('index growth') meaning that price variation is increasing.
- Statewide, the market basket index cost $24,575 in 2020, and price growth overall was 7.2% between 2018 and 2020.

HOSPITAL UTILIZATION

KEY FINDINGS

HOSPITAL UTILIZATION

- Despite Massachusetts ranking well among states on health status, high use of avoidable inpatient and ED care suggest opportunities for improvement.
- Massachusetts continues to have higher hospital utilization than the U.S. overall, including inpatient stays (7% higher), outpatient visits (42% higher), and ED visits (11% higher), but the gap has narrowed slightly in recent years.
- Per-capita total ED visits, potentially avoidable ED visits and behavioral health-related ED visits declined significantly in 2020. By the end of 2021, ED visits in all categories had not yet returned to pre-2020 levels. Avoidable ED visit rates varied nearly three-fold across regions in Massachusetts in 2020.
- Children (aged 0-17) experienced the greatest decline in potentially avoidable ED visits between 2019 and 2021 (31%), followed by adults aged 18-64 (16%) and those aged 65+ (7%).
- Between January 2019 and December 2021, the rate of boarding for behavioral health-related ED visits increased. This increase was driven by mental health-related visits for which the boarding rate (more than 12 hours in the ED) grew from 37% to 45%.
- All-payer readmission rates in Massachusetts worsened in 2020. The gap between the Medicare readmission rate in Massachusetts and the national rate continues to widen, with Massachusetts having the second-highest rate among all the states.
- In 2019, Massachusetts had the sixth-highest rate of preventable hospitalizations among Medicare beneficiaries in the U.S.
- Between 2010 and 2020, the share of all stays and newborn deliveries that took place at community hospitals continued to decline. In 2020, while community hospitals accounted for 51.8% of all hospital stays, they accounted for 48.7% of newborn stays.
- In Massachusetts, inpatient and outpatient hospital care is increasingly provided by a few large provider systems, most of which are anchored by academic medical centers. Beth Israel Lahey Health and Mass General Brigham together provide 41% of hospital-based care, with the other largest systems representing far smaller shares.

INTRODUCTION

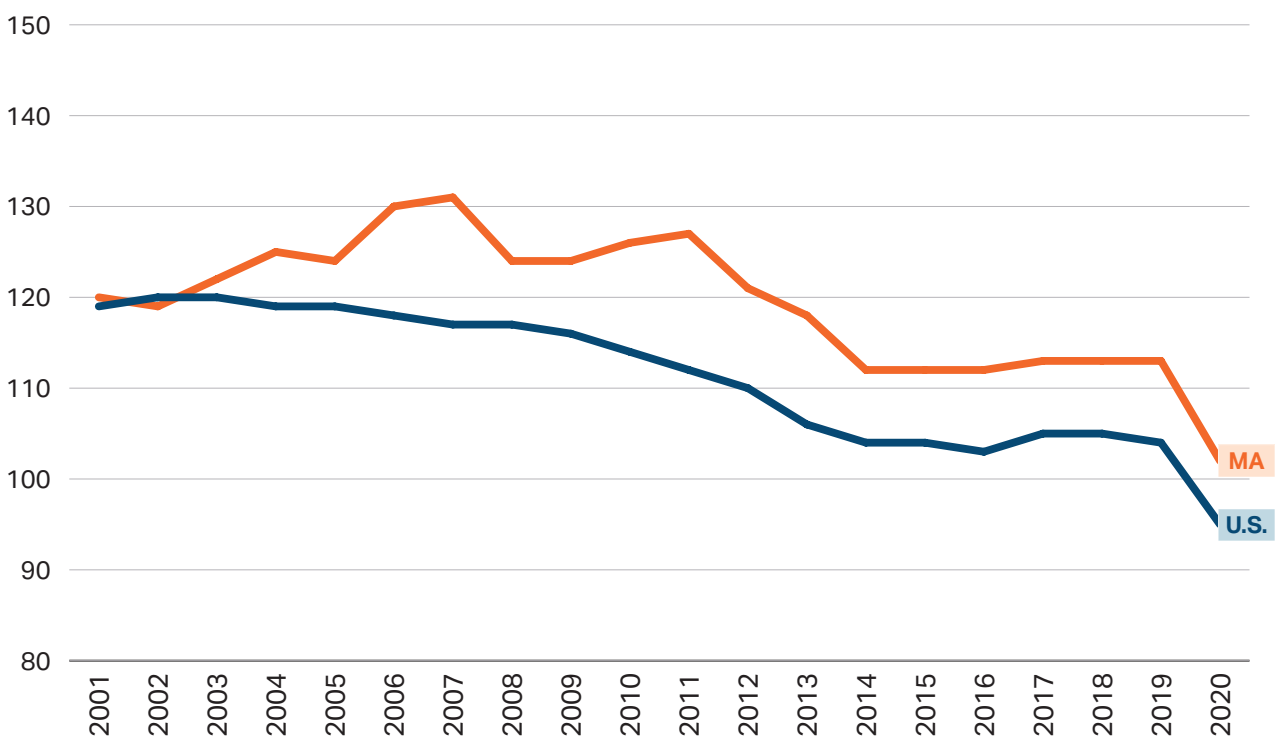
HOSPITAL UTILIZATION

While Massachusetts has consistently ranked well compared to other states on metrics such as health status and health care access, the Commonwealth ranked 37th in the nation for avoidable hospital use and costs in 2020, according to the Commonwealth Fund's Scorecard on State Health System Performance, worsening in rank for the second consecutive year.[1] 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. The HPC has recommended action to reduce unnecessary hospital use and shift appropriate care to community hospitals.

This section reviews recent trends in hospital use, largely through 2020, and examines several measures of avoidable hospital utilization, including avoidable emergency department (ED) use, ED boarding, and readmissions. It also examines trends in the Commonwealth in community-appropriate inpatient care occurring in community hospitals versus teaching hospitals and academic medical centers. These data capture the beginning of the COVID-19 pandemic, which has had a profound effect on hospital-based care in 2020 and beyond, and provide an important baseline for trends in hospital use during the pandemic. For more information on the impact of COVID-19 on hospital utilization in 2020, please see the HPC's Impact of COVID-19 on the Massachusetts Health Care System: Interim Report.

1 Commonwealth Fund's 2020 Scorecard on State Health System Performance. Available at: https://scorecard.commonwealthfund.org/. Accessed February 2021.

INPATIENT HOSPITAL DISCHARGES PER 1,000 RESIDENTS IN MASSACHUSETTS AND THE U.S., 2001–2020

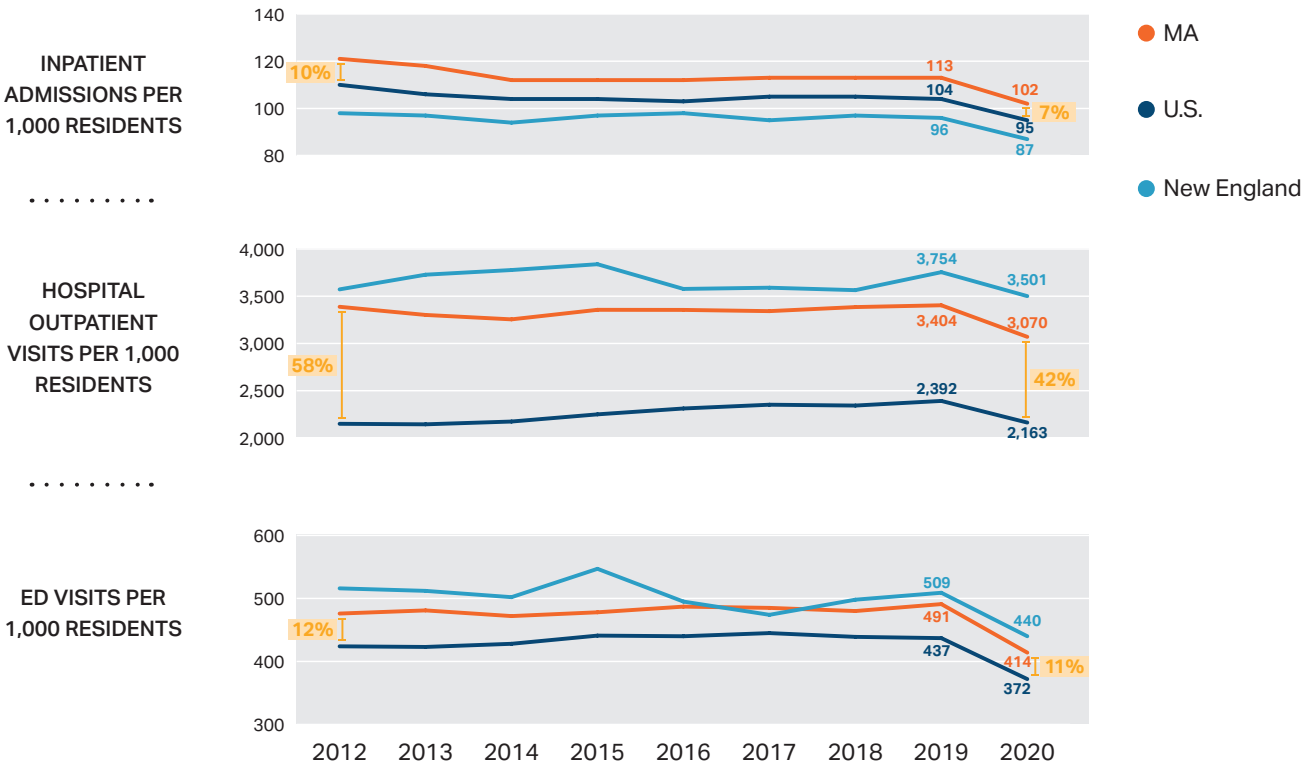


- After declining sharply from 2011 to 2014, Massachusetts residents' inpatient hospital use remained near 2014 levels through 2019. However, in 2020, inpatient hospital use declined sharply in both Massachusetts and the U.S.
- In 2020, the number of inpatient hospital discharges per 1,000 Massachusetts residents dropped 10% from 2019, slightly larger than the 9% decline in discharges in the U.S.

NOTES: U.S. data includes Massachusetts. Data are for community hospitals as defined by Kaiser Family Foundation, which represent 85% of all hospitals.

SOURCES: Kaiser Family Foundation analysis of American Hospital Association data (U.S., 2001-2020).

HOSPITAL USE IN MASSACHUSETTS, NEW ENGLAND, AND THE U.S., 2012–2020

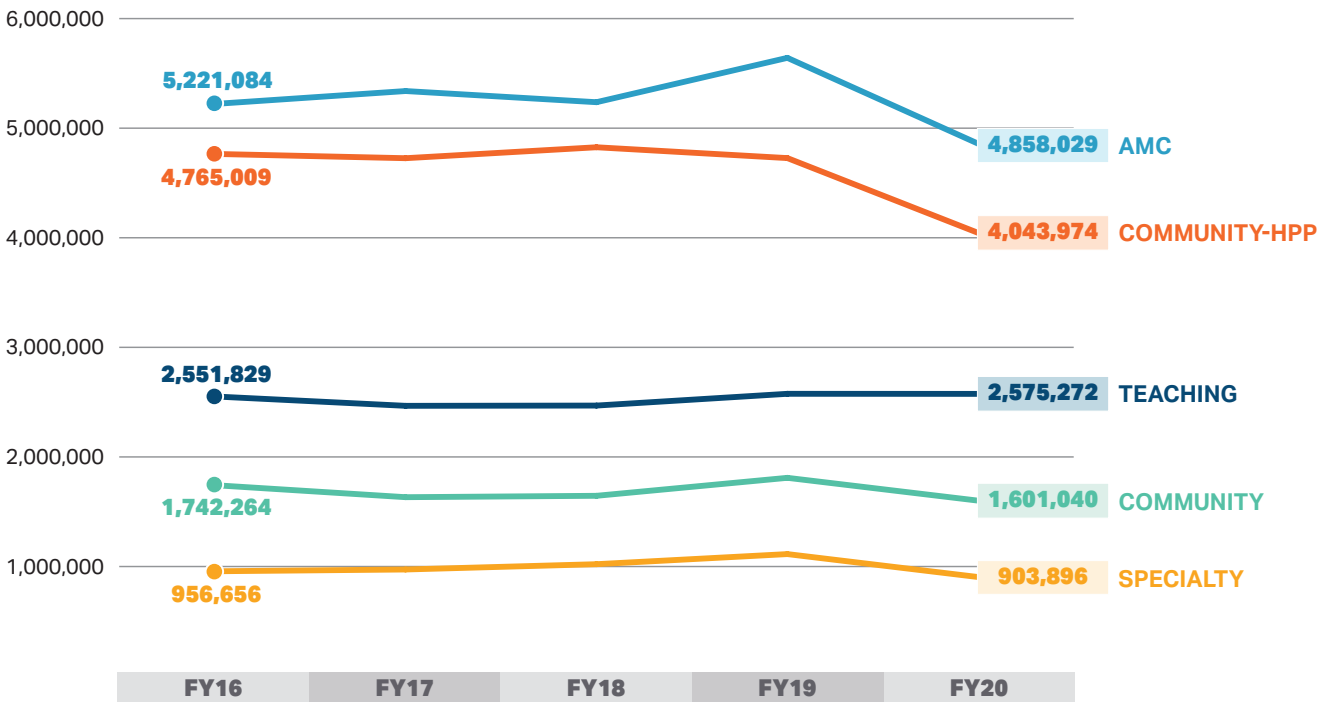


NOTES: Data are for community hospitals as defined by Kaiser Family Foundation, which represent 85% of all hospitals. Federal hospitals, long term care hospitals, psychiatric hospitals, institutions for the intellectually disabled, and alcoholism and other chemical dependency hospitals are not included. The United States category includes Massachusetts. 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 (2020). "Hospital Admissions per 1,000 Population by Ownership Type" (2012 - 2020); "Hospital Emergency Room Visits per 1,000 Population by Ownership Type" (2012-2020); "Hospital Outpatient Visits per 1,000 Population by Ownership Type" (2012-2020). http://www.kff.org/state-category/providers-service-use/hospital-utilization/

- Through 2020, Massachusetts continues to have higher utilization of hospital inpatient, outpatient, and ED services relative to the U.S., although the gaps have narrowed since 2012.
- In 2020, the rate of hospital inpatient visits as well as outpatient visits in Massachusetts declined 10% from 2019 levels. The rate of emergency department visits in Massachusetts declined 16%.
- Relative to its regional neighbors, Massachusetts continued to have lower rates of hospital outpatient visits and ED visits through 2020, but higher rates of inpatient admissions.

HOSPITAL OUTPATIENT VISITS BY HOSPITAL COHORT, FY2016 – FY2020

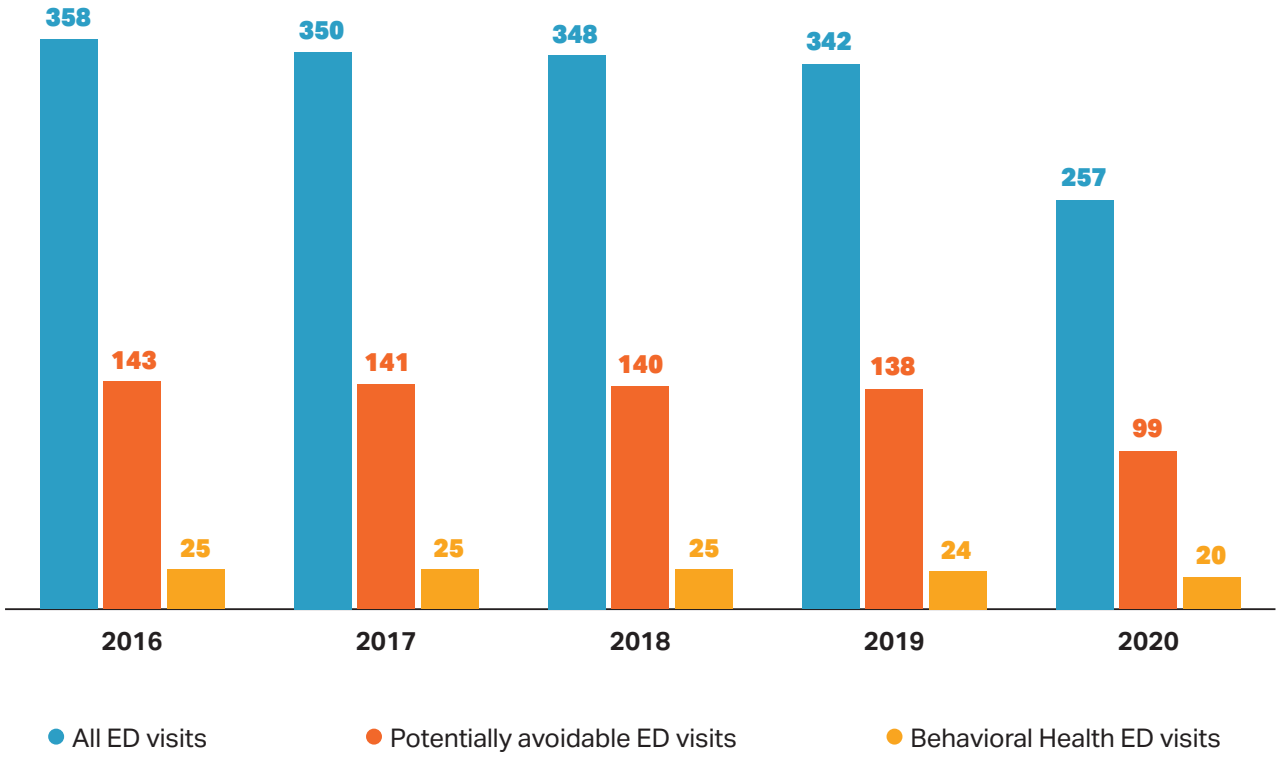


NOTES: Outpatient visits are reported by the hospitals.

SOURCE: Massachusetts Center for Health Information and Analysis, FY2020 Massachusetts Hospital Profiles, FY2016-2020. https://www.chiamass.gov/hospital-profiles/.

- Between 2016 and 2019, the number of outpatient visits remained relatively stable by hospital cohort. Notably, there was an 8% increase in outpatient visits at academic medical centers between 2018 and 2019.
- However, between 2019 and 2020, the number of outpatient visits at most types of hospitals declined sharply. Between 2019 and 2020, the share of all outpatient visits occurring at academic medical centers declined slightly from 36% to 35%.

ALL ED VISITS, POTENTIALLY AVOIDABLE ED VISITS, AND BEHAVIORAL HEALTH ED VISITS PER 1,000 RESIDENTS, 2016–2020



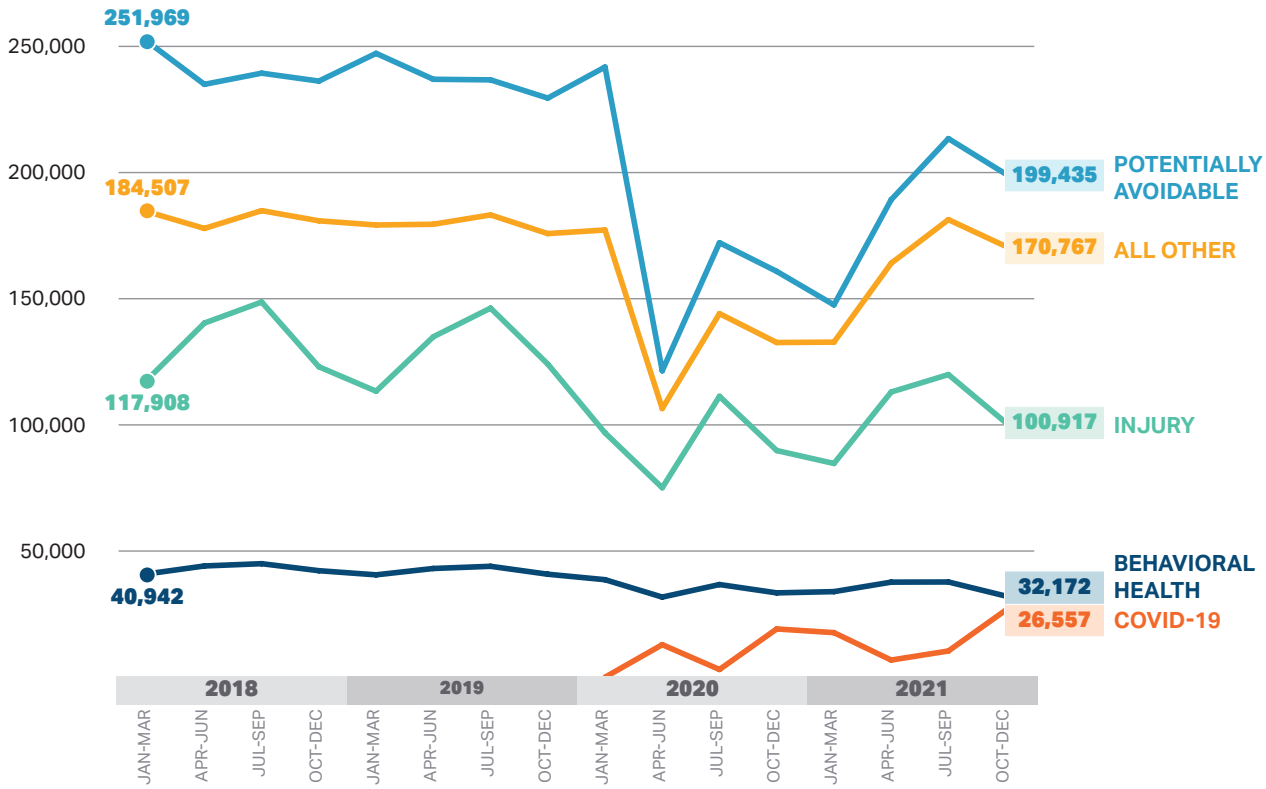
- Between 2016 and 2019, ED visits per 1,000 residents declined 5%. In 2020, ED rates declined 25% from 2019 levels.
- Between 2019 and 2020, potentially avoidable ED visits declined by 28% and behavioral health-related ED visits declined by 18%.

HOSPITAL

NOTES: Excludes two ED sites due to missing data. 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 Revised Software (CCSR) diagnostic classifications. To improve classification rate, diagnosis codes unclassified by the Billings algorithm were truncated and shortened codes were re-classified. Please see the technical appendix for additional details.

SOURCES: HPC analysis of Center for Health Information and Analysis Emergency Department Database, CY2016 - 2020

ED VISITS BY VISIT CATEGORY AND QUARTER, JANUARY 2018 – DECEMBER 2021

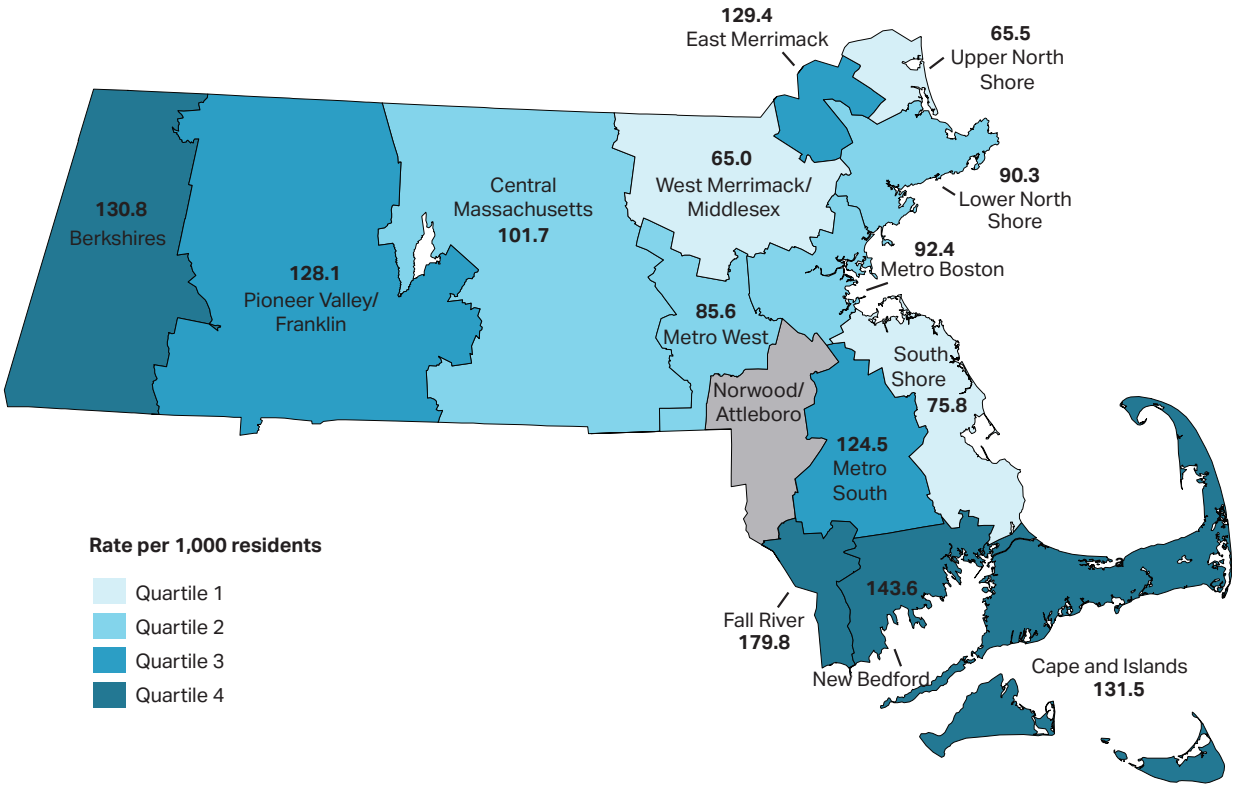


NOTES: Excludes two ED sites due to missing data. Avoidable ED visits are based on the Billings algorithm, which classifies an ED visit into the following categories: Emergent - ED care needed and not avoidable; Emergent - ED care needed but avoidable; Emergent - primary care treatable; and Non-emergent - 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 Revised Software (CCSR) diagnostic classifications. To improve classification rate, diagnosis codes unclassified by the Billings algorithm were truncated and shortened codes were re-classified. Please see the technical appendix for additional details.

SOURCES: HPC analysis of Center for Health Information and Analysis Emergency Department Database, CY2018 – 2021, preliminary data for Oct-Dec 2021

- With the onset of the COVID-19 pandemic, ED visits in all non-COVID-19 categories declined significantly during the April to June quarter of 2020. By October to December 2021, ED visits in these categories still had not returned to previous levels.
- By October to December 2021, ED visits in all non-COVID-19 categories were lower than ED visits during the same quarter of 2018. Compared to 2018 levels, behavioral health ED visits were 24% lower, injury visits were 18% lower, potentially avoidable visits were 16% lower, and ED visits for all other reasons were 6% lower.

POTENTIALLY AVOIDABLE EMERGENCY DEPARTMENT UTILIZATION BY HPC REGION, 2020

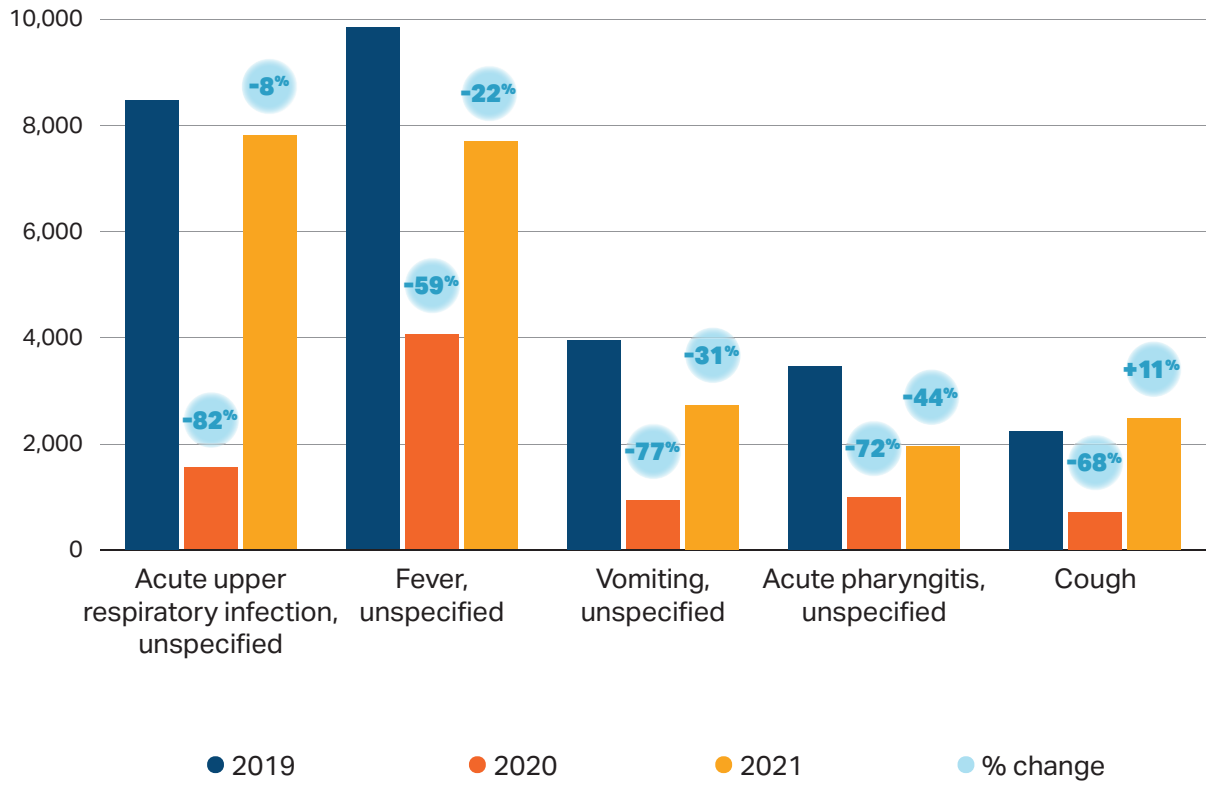


NOTES: Excludes two ED sites due to missing data. Avoidable ED visits are based on the Billings algorithm, which classifies an ED visit into the following categories: Emergent - ED care needed and not avoidable; Emergent - ED care needed but avoidable; Emergent - primary care treatable; and Non-emergent - 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. To improve classification rate, diagnosis codes unclassified by the Billings algorithm were truncated and shortened codes were re-classified. Please see the technical appendix for additional details.

SOURCES: HPC analysis of Center for Health Information and Analysis Emergency Department Database, CY2020

- The rate of potentially avoidable ED visits is a key metric of health system efficiency and quality. An avoidable visit suggests 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 99.2 visits per 1,000 residents in 2020, representing a 28% decline in avoidable ED utilization compared to 2019.
- Despite the overall drop in statewide rates, considerable variation exists by region. Rates varied by nearly three-fold, from 179.8 avoidable ED visits per 1,000 residents in Fall River to 65.0 per 1,000 residents in West Merrimack and Middlesex. The visit rate for Norwood / Attleboro is unavailable due to missing data.
- The regions with the smallest declines in potentially avoidable ED visits in 2020 compared to 2019 include Fall River (22.4%) and the Cape and Islands (22.7%). The regions with the largest declines in potentially avoidable ED visits include New Bedford (28.8%) and East Merrimack (28.1%).

TOP DIAGNOSIS SUBCATEGORIES OF POTENTIALLY AVOIDABLE ED VISITS FOR CHILDREN AGED 0-17 (EXCLUDING INFLUENZA) AND PERCENT CHANGE RELATIVE TO SAME PERIOD IN 2019, 2019–2021

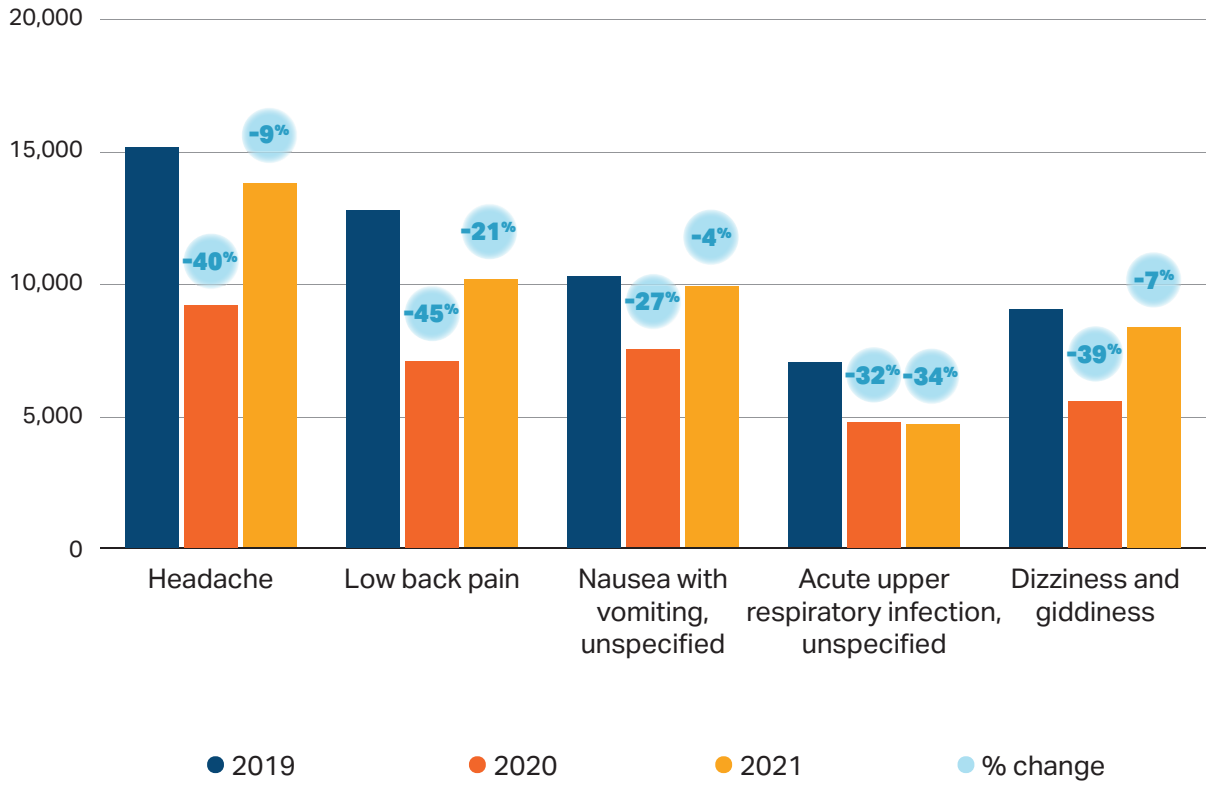


- From 2019 to 2021, four of the most common potentially avoidable conditions among children had varying degrees of decline: acute upper respiratory infections (8%), fever (22%), vomiting (31%), and pharyngitis (44%). However, visits for cough increased by 11% between 2019 and 2021.
- Notably, while there were 12,872 potentially avoidable ED visits among children for influenza between September 16, 2019 and March 15, 2020, there were fewer than 50 such visits among children during the corresponding period between September 16, 2020 and March 15, 2021 – likely a result of vastly reduced influenza rates because of COVID-19 mitigation efforts, as well as the possible influence of higher influenza vaccination rates.

NOTES: Includes ED visits between March 16th and September 15th of each year. Excludes two ED sites due to missing data. Avoidable ED visits are based on the Billings algorithm, which classifies an ED visit into multiple categories "Avoidable" is defined here as ED visits that had at least a 70% probability of being emergent - primary care treatable or non-emergent. Top five diagnosis codes include: J069 (Acute upper respiratory infection, unspecified), R509 (Fever, unspecified), R1110 (Vomiting, unspecified), J029 (Acute pharyngitis, unspecified), and R05 (Cough).

SOURCES: HPC analysis of Massachusetts Acute Hospital Case Mix Emergency Department Database, 2019-2020, preliminary 2021

TOP DIAGNOSIS SUBCATEGORIES OF POTENTIALLY AVOIDABLE ED VISITS FOR ADULTS AGED 18-64 AND PERCENT CHANGE RELATIVE TO SAME PERIOD IN 2019, 2019–2021

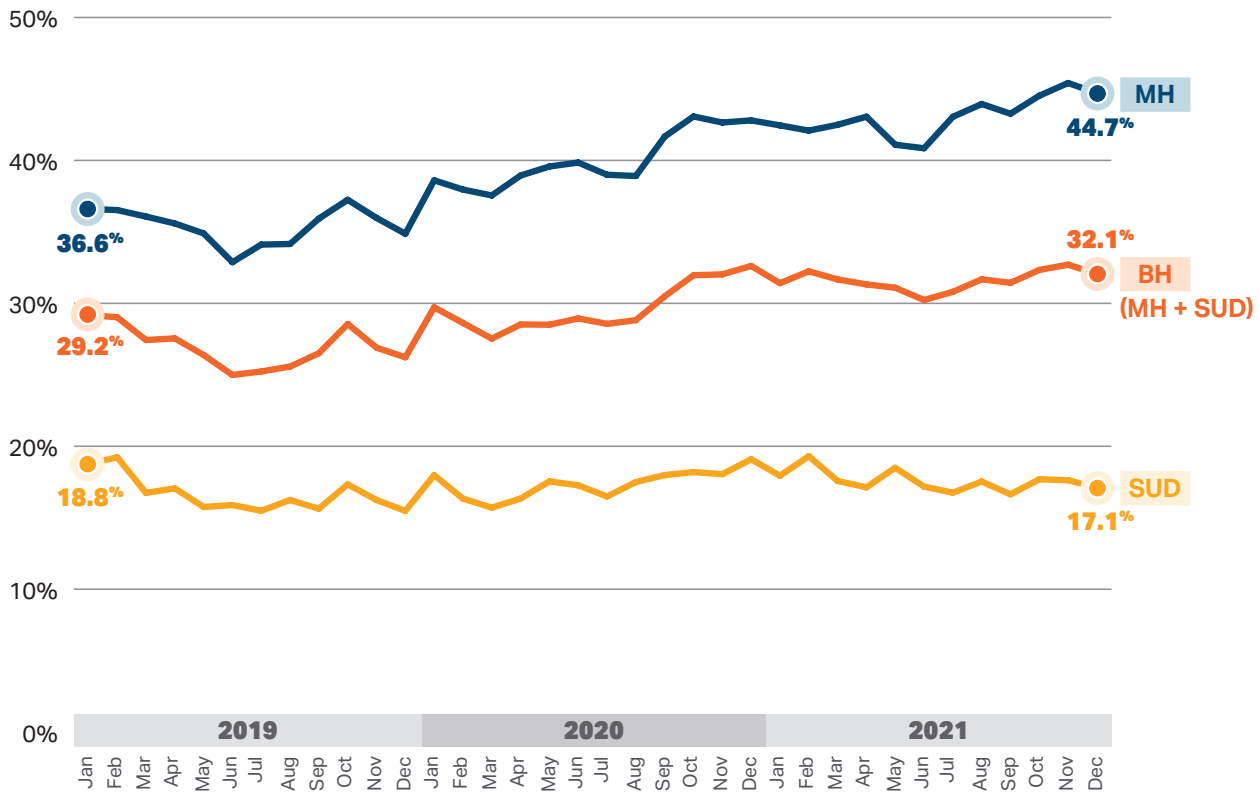


NOTES: Includes ED visits between March 16th and September 15th of each year. Excludes two ED sites due to missing data. Avoidable ED visits are based on the Billings algorithm, which classifies an ED visit into multiple categories. "Avoidable" is defined here as ED visits that had at least a 70% probability of being emergent - primary care treatable or non-emergent. Top five diagnosis codes include: R51, R510, and R519 (Headache), M545 (Low back pain), R112 (Nausea with vomiting, unspecified), J069 (Acute upper respiratory infection, unspecified), and R42 (Dizziness and giddiness). Three diagnosis codes were included in the "Headache" category to account for changes in coding guidance.

SOURCES: HPC analysis of Massachusetts Acute Hospital Case Mix Emergency Department Database, 2019-2020, preliminary 2021

- From 2019 to 2021, among adults aged 18-64, ED visit rates dropped for common potentially avoidable conditions. Rates declined for headache (9%), low back pain (21%), nausea with vomiting (4%), acute upper respiratory infections (34%), and dizziness and giddiness (7%).
- Among adults over age 65 (not shown), ED visits declined for the top five potentially avoidable conditions for this age group: urinary tract infections (16%), low back pain (11%), essential hypertension (6%), and epistaxis (16%), though visits slightly increased for dizziness and giddiness (3%).
- For all potentially avoidable ED visits between 2019 and 2021, children aged 0-17 experienced the greatest decline (31%) followed by adults aged 18-64 (16%) and those aged 65+ (7%)

PERCENT OF BEHAVIORAL HEALTH-RELATED ED VISITS THAT RESULTED IN BOARDING BY TYPE OF VISIT, 2019–2021

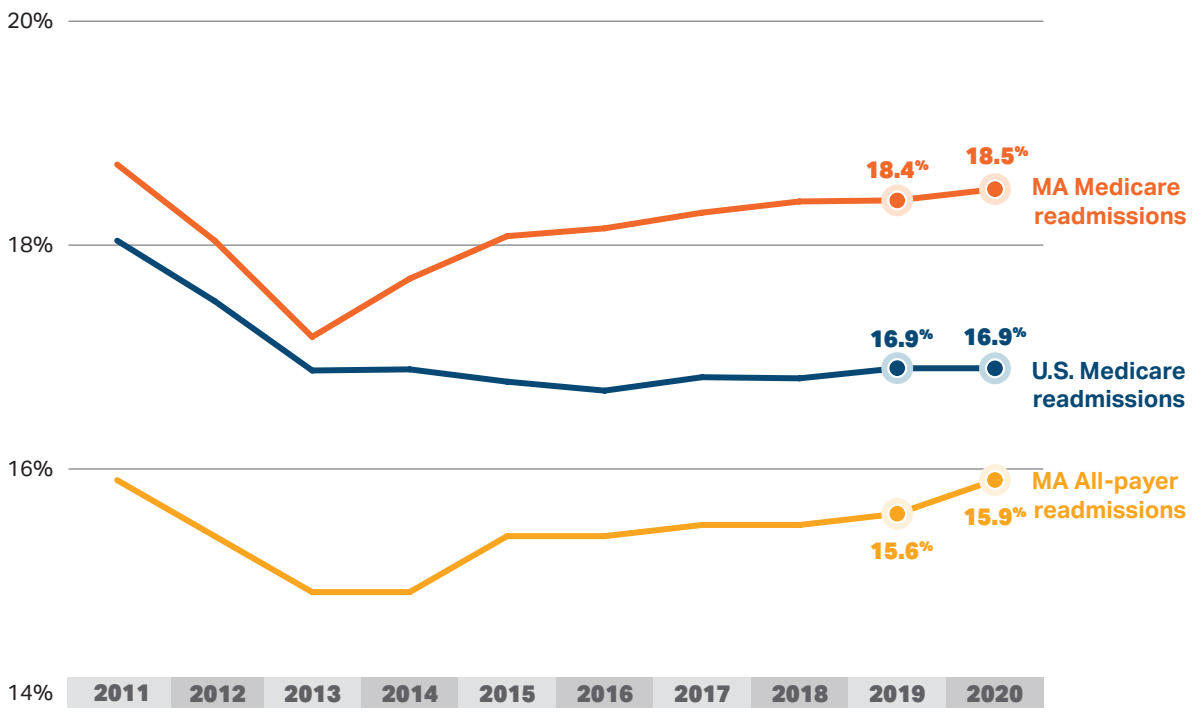


NOTES: MH = mental health; BH = behavioral health; SUD = substance use disorder. Excludes two ED sites due to missing data. Excludes an additional eight ED sites due to incomplete or irregular length of stay data. The HPC defines ED boarding as greater than or equal to 12 hours in the hospital ED. ED visits where patients were admitted to the same hospital are not included in the dataset. Behavioral health visits were identified using AHRQ's CCSR for the primary diagnosis (BH: MBD001-MBD034, Mental Health: MBD001-MBD013, Substance Use: MBD17-MBD34). See technical appendix.

SOURCES: HPC analysis of Center for Health Information and Analysis Emergency Department Database, CY2019-2021, preliminary data for Oct-Dec 2021

- Behavioral health ED boarding rates grew from 2019 to 2021, driven by an 8- percentage point increase in boarding for mental health-related stays.
- Additionally, rates of ED boarding differed by age group. By December 2021, 41.2% of behavioral health-related ED visits among children aged 0-17 resulted in boarding, compared to 31.6% of visits among adults aged 18-64 and 24.9% of visits among adults aged 65+.

THIRTY-DAY READMISSION RATES, MASSACHUSETTS AND THE U.S., 2011–2020

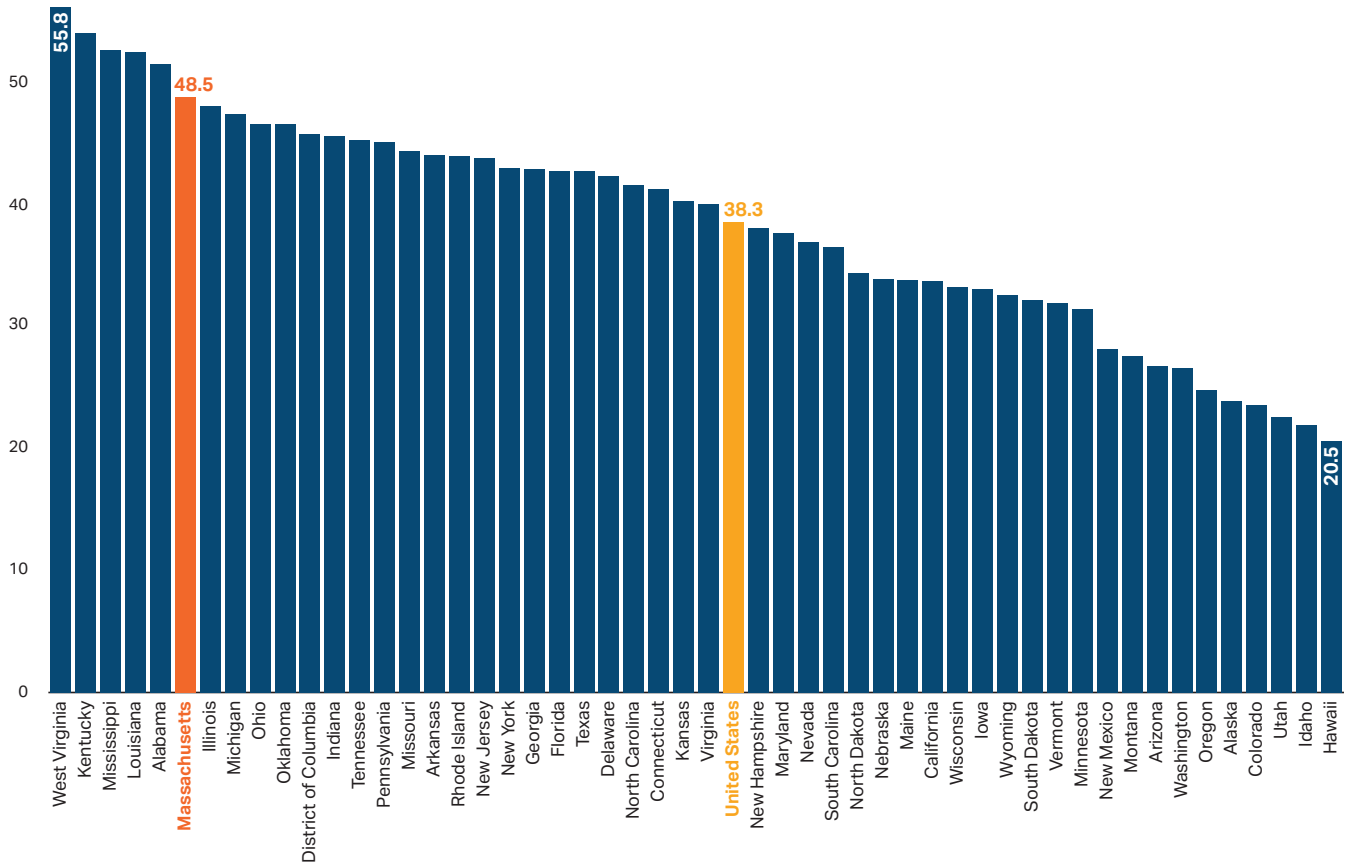


NOTES: MA and U.S. Medicare readmission rates are all-cause hospital 30-day readmission rates among fee-for-service Medicare beneficiaries (i.e., the number of readmissions divided by the total number of admissions where the beneficiary was discharged alive). MA All-payer readmission rate is the rate of unplanned hospitalizations for any reason within 30 days of eligible discharges, excluding obstetric, psychiatric, cancer treatment, and rehabilitation admissions as well as against medical advice discharges.

SOURCES: Centers for Medicare and Medicaid Services (U.S. and MA Medicare), CY2011-2020; Center for Health Information and Analysis (all-payer MA), SFY2011-2020

- 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, although increases have been slower in recent years. Massachusetts' 2020 readmission rate was the second highest among the states in the U.S.
- All-payer readmission rates in Massachusetts increased in 2020. Commercial readmission rates slightly increased between 2019 and 2020 (10.0% to 10.2%), while Medicaid readmission rates slightly decreased (17.1% to 16.9%).

ANNUAL PREVENTABLE HOSPITAL ADMISSIONS PER 1,000 FEE-FOR-SERVICE MEDICARE BENEFICIARIES AGED 65+ IN 2019, BY STATE

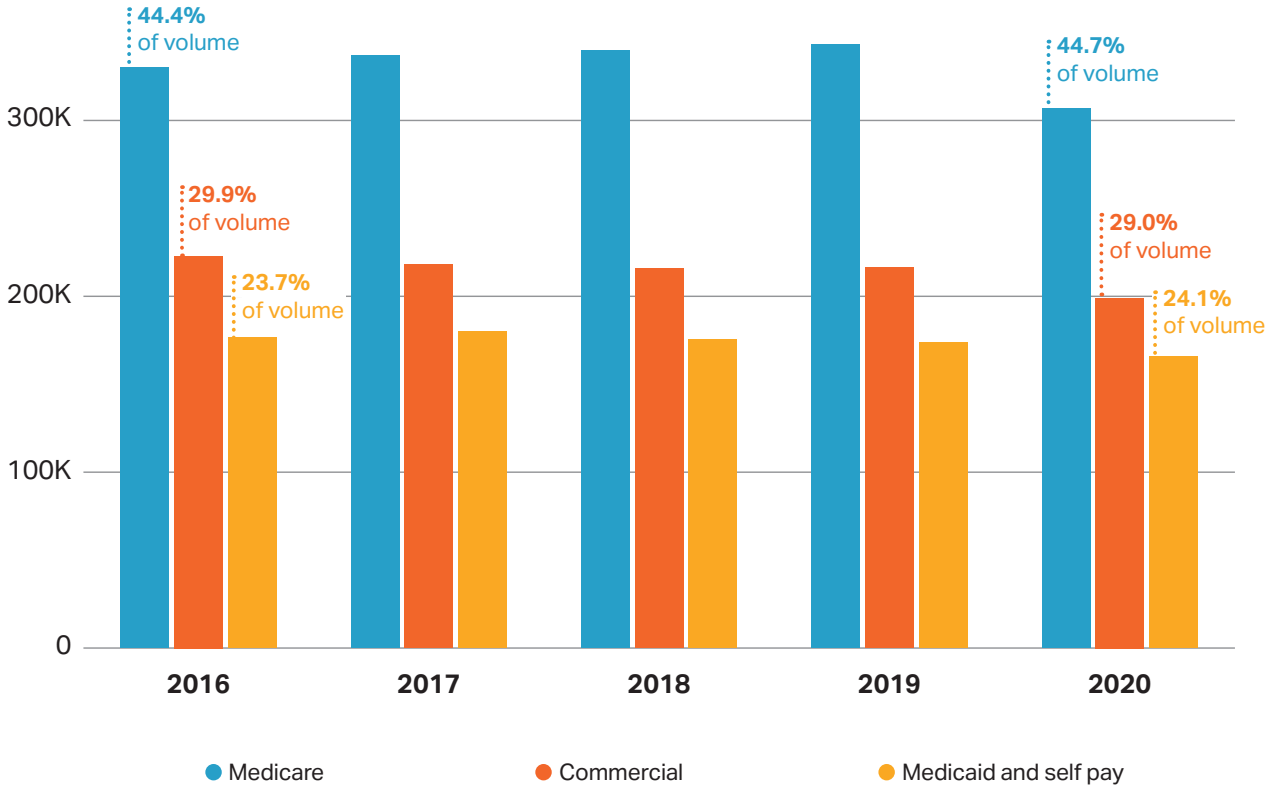


NOTES: Data includes only beneficiaries enrolled in Medicare fee-for-service aged 65+ and combine admissions for the following ambulatory care-sensitive conditions: diabetes, COPD, asthma, hypertension, CHF, dehydration, bacterial pneumonia, UTI and lower extremity amputation. See technical appendix for additional details.

SOURCES: HPC analysis of the Center for Medicare and Medicaid Services Geographic Variation Public Use file, 2020

- In 2019, Massachusetts had the sixth-highest rate of preventable hospitalizations among Medicare beneficiaries in the U.S.
- Congestive heart failure (CHF) was the most common cause of preventable hospital admissions in Massachusetts. In 2019, there were 17.7 admissions for CHF per 1,000 Medicare beneficiaries in Massachusetts, compared to an average 13.5 admissions per 1,000 Medicare beneficiaries nationally.

TOTAL INPATIENT HOSPITAL DISCHARGES BY PAYER, 2016–2020

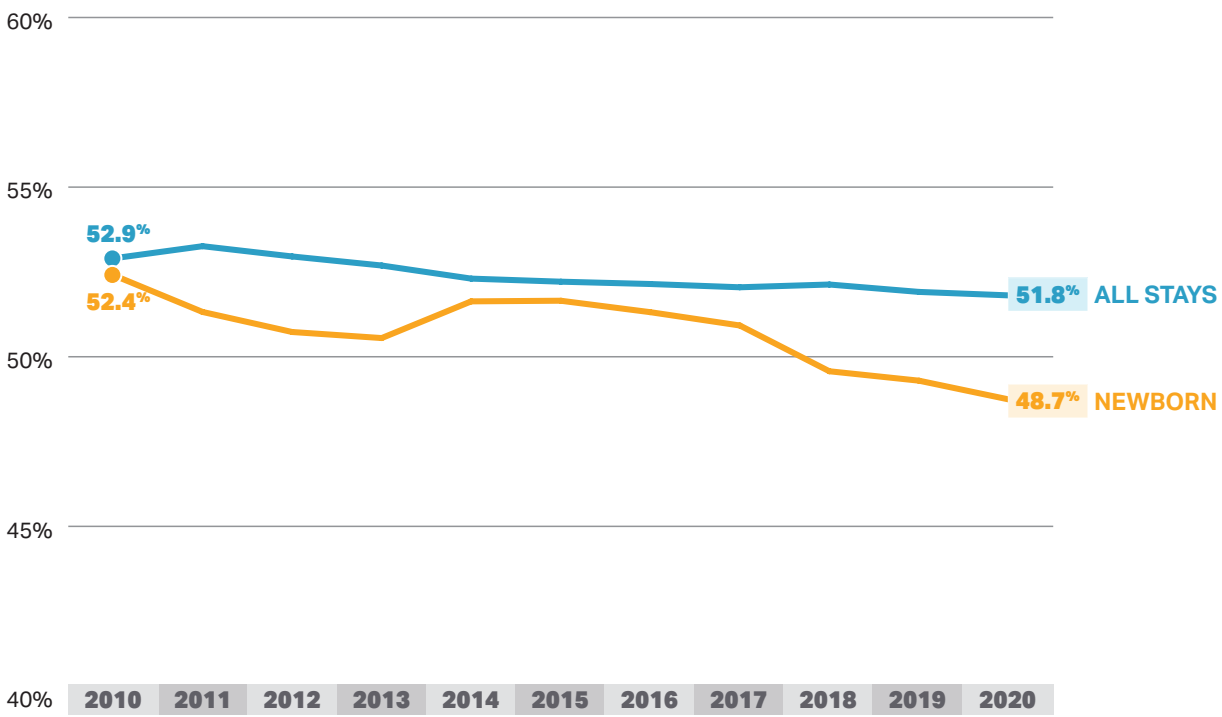


NOTES: Excludes one hospital due to missing data. Out of state residents (~5% of discharges) are excluded from this analysis. Medicaid and self pay category includes free care, health safety net, and CommonwealthCare/ConnectorCare plans. All other payers (including other government) are not illustrated, but accounted for in percentage calculations. The number of inpatient hospital discharges coded with self pay as the primary payer has increased nearly three-fold between 2015 and 2019, from 0.6% to 2.2%. Based on provider input, the HPC and CHIA believe that many Medicaid discharges were incorrectly coded as self pay. To address this inconsistency, the HPC grouped self pay with Medicaid for this analysis.

SOURCES: HPC analysis of Center for Health Information and Analysis Inpatient Discharge Database, CY2016-2020

- Over the past five years, Medicare patients had comprised an increasing share of all inpatient hospital discharges in Massachusetts, growing from 44.4% in 2016 to 45.9% in 2019. This trend is partly reflects a higher share of the population enrolled in Medicare due to the aging of the state's population. Medicare's share of hospital discharges dropped to 44.7% in 2020.
- The share of discharges from commercially-insured patients has decreased slightly from 29.9% in 2016 to 29.0% in 2020. 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.
- In 2020, 14,680 discharges had a primary payer that was not Medicare, Medicaid, or commercial insurance. Of these discharges, 21% were covered by dental insurance, 10% were covered by auto insurance, and 10% were covered by worker's compensation.

PERCENTAGE OF INPATIENT STAYS OCCURRING IN COMMUNITY HOSPITALS, BY DISCHARGE TYPE, 2010–2020

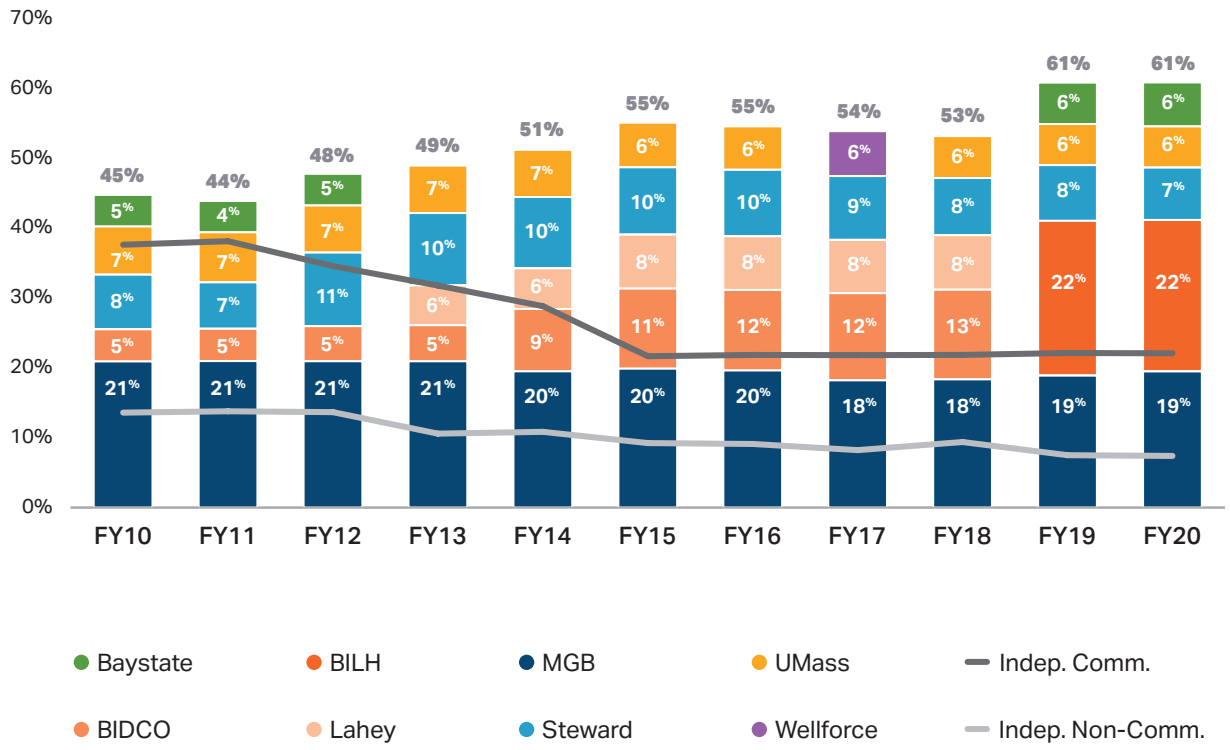


NOTES: Excludes one hospital due to missing data. The Center for Health Information and Analysis defines community hospitals as general acute care hospitals that do not support large teaching and research programs.

SOURCES: HPC analysis of Center for Health Information and Analysis Hospitals Inpatient Discharge Database, CY2010-2020

- One strategy to reduce health care spending is to shift community appropriate inpatient care to community hospitals from higher-cost academic medical centers.
- While the share of all stays occurring at community hospitals has declined only slightly since 2010, the share of newborn deliveries taking place at community hospitals declined 2.6 percentage points between 2016 and 2020, as more newborn deliveries take place at academic medical centers and teaching hospitals.

SHARE OF INPATIENT AND OUTPATIENT CARE IN THE FIVE LARGEST HOSPITAL SYSTEMS AND INDEPENDENT HOSPITALS, FY2010 – FY2020



NOTES: Partners HealthCare changed its name to Mass General Brigham (MGB) in 2019. 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, FY2010-2020

- In Massachusetts, hospital care is increasingly provided by a small number of large provider systems. Examining inpatient and outpatient care combined, the HPC found that 61% of such care was provided at one of the five largest hospital systems in 2020, a significant increase from previous years in large part owing to the formation of Beth Israel Lahey Health (BILH) in 2019. BILH and Mass General Brigham (MGB) provide 41% of hospital-based care, with other systems representing far smaller shares.
- The formation of BILH was accompanied by a slight decrease in care at independent non-community hospitals in 2019, a trend that continued in 2020. The share of care at independent community hospitals continues to remain at about 22% of care.

POST-ACUTE CARE

KEY FINDINGS

POST-ACUTE CARE

- Following a hospitalization, Massachusetts patients have a higher rate of discharge to institutional post-acute care (PAC) and home health than the national average. The difference in home health discharge rates between Massachusetts and the U.S. has widened over time.

- The percentage of Massachusetts hospital discharges to institutional PAC dropped by 3 percentage points from 2019 to 2021, while home health discharges increased by 2 percentage points. The share of hospital discharges to routine discharge remained stable. The decline in discharges to institutional PAC continues a trend since 2015, though the decline leveled off in 2021.

- The overall shift away from institutional PAC toward home health has been driven by changing discharge patterns for major hip and knee replacement surgery. In 2010, 54% of patients undergoing this surgery were discharged to institutional PAC and 42% to home health care, in contrast to 13% and 82%, respectively, in 2020. These discharges shifted slightly back toward institutional PAC in 2021.

- A third of COVID-related hospitalizations led to a discharge to an institutional PAC setting at the beginning of the COVID-19 pandemic. This rate dropped to roughly 20% by the last quarter of 2020, a trend that continued throughout 2021.

INTRODUCTION

POST-ACUTE CARE

Post-acute care (PAC) refers to a range of medical services that support a patient's rehabilitation and nursing care needs following a hospitalization. Depending on patient needs, these services may be delivered at home (through a home health agency) 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 are discharged to home with no formal post-acute care, but they may receive some services, such as physical therapy, on an outpatient basis.

PAC is a large category of health care spending, representing nearly $53 billion and 15% of total Original Medicare (fee-for-service) spending nationwide. 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 2018, Massachusetts Medicare spending on PAC exceeded $1.6 billion, and annual PAC spending per beneficiary in Massachusetts was 16.5% higher ($269 more) than the U.S. average.[1]

Institutional PAC is considerably more expensive than home health, and the cost differential has grown recently. The COVID-19 pandemic may have increased the cost differential as lower acuity patients who may otherwise have used a SNF used home health instead, raising the average acuity of the remaining SNF patients, while home health patients may have used fewer services on average to reduce exposure. In 2020, Medicare spending in Massachusetts for a SNF stay was $13,000 on average, representing an increase of $2,500 from 2019. In contrast, the cost of a home health episode dropped by a third from 2019 and averaged $2,100 in 2020.[1] While it's unclear whether the growing cost differential in these care settings will persist, choosing the appropriate PAC setting can have a substantial impact on both costs and patient experience. The COVID-19 pandemic has increased the focus on this policy area, presenting new challenges such as the capacity and capability of PAC facilities and home health agencies to safely care for COVID-19 patients as they recover from infection.[2]

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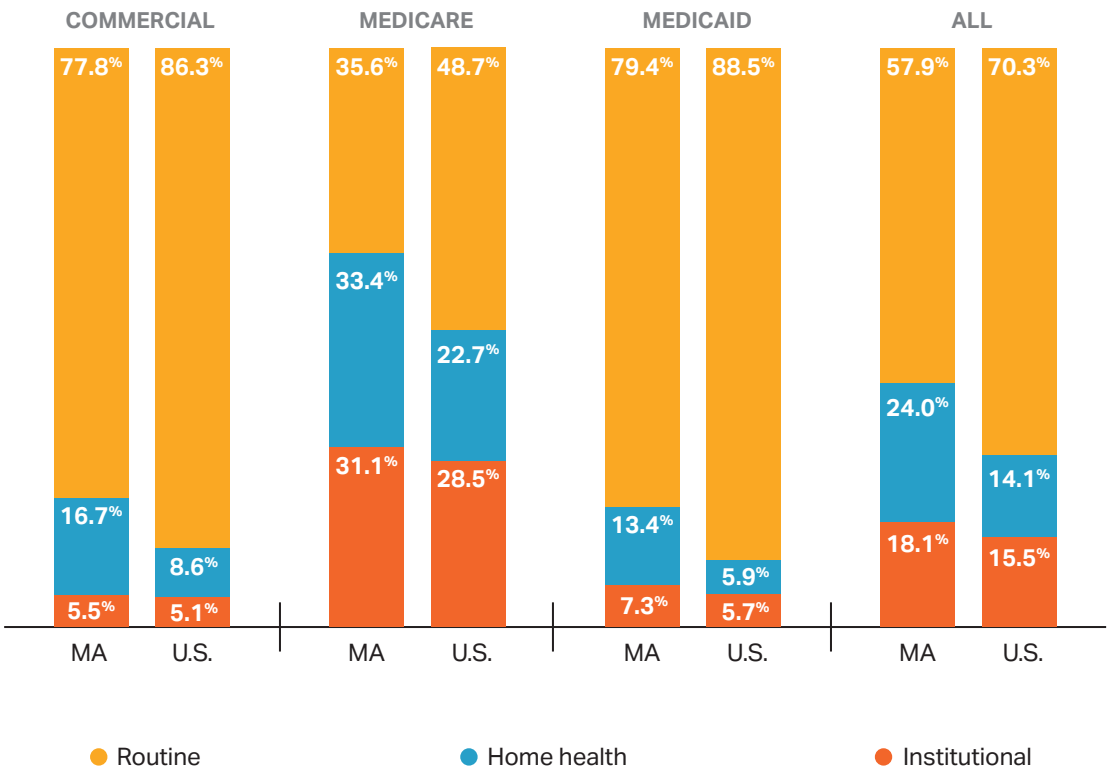
1 HPC analysis of 2020 CMS Medicare Geographic Variation Public Use File.

2 Grabowski DC, Joynt Maddox KE. Post acute Care Preparedness for COVID-19: Thinking Ahead. JAMA. 2020;323(20):2007–2008. doi:10.1001/jama.2020.4686

USE OF POST-ACUTE CARE IN MASSACHUSETTS AND THE U.S., ALL DRGS, 2019

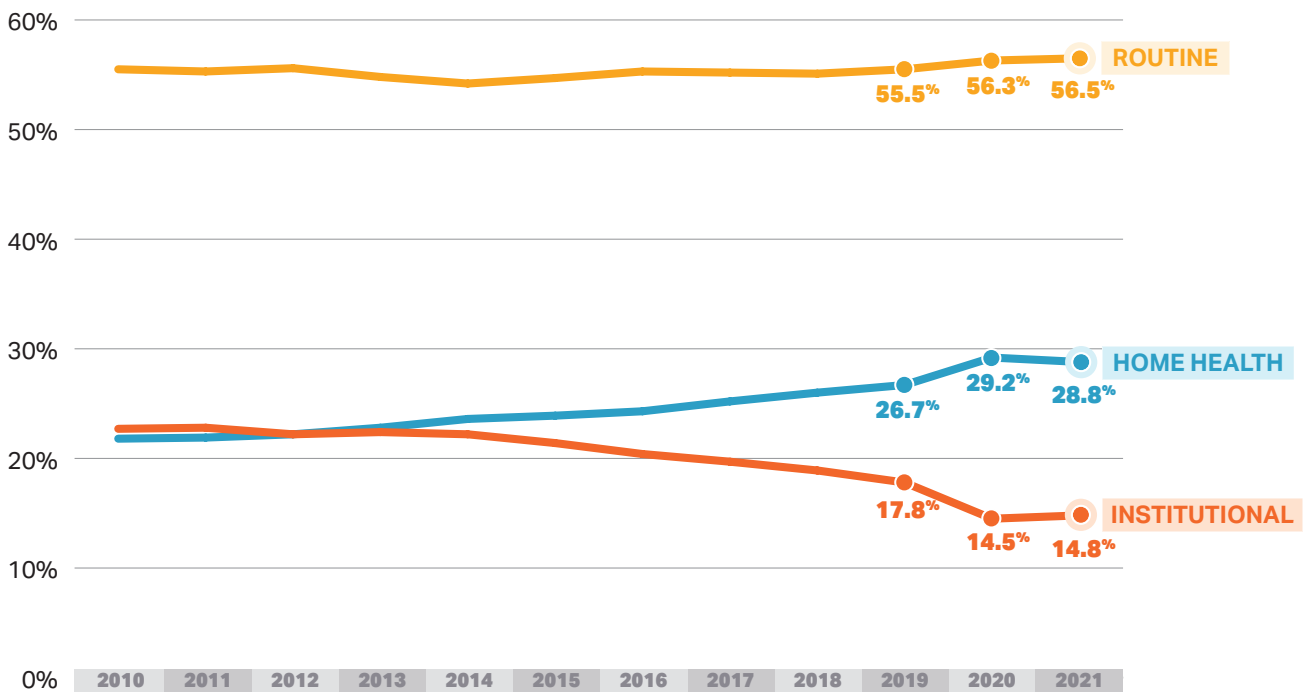


- Across all payers in 2019, Massachusetts had an institutional discharge rate that was 2.5 percentage points higher than the U.S. average and a home health discharge rate that was 9.9 percentage points higher.
- The difference in home health discharge rate between Massachusetts and the U.S. had widened over time: in 2016, the home health discharge rate was 8.8 percentage points higher in Massachusetts.
- 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. See technical appendix for details.

SOURCES: HPC analysis of Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample Survey and State Inpatient Sample, 2019

POST-ACUTE CARE IN MASSACHUSETTS FOLLOWING HOSPITAL DISCHARGE, ALL DRGS, 2010–2021

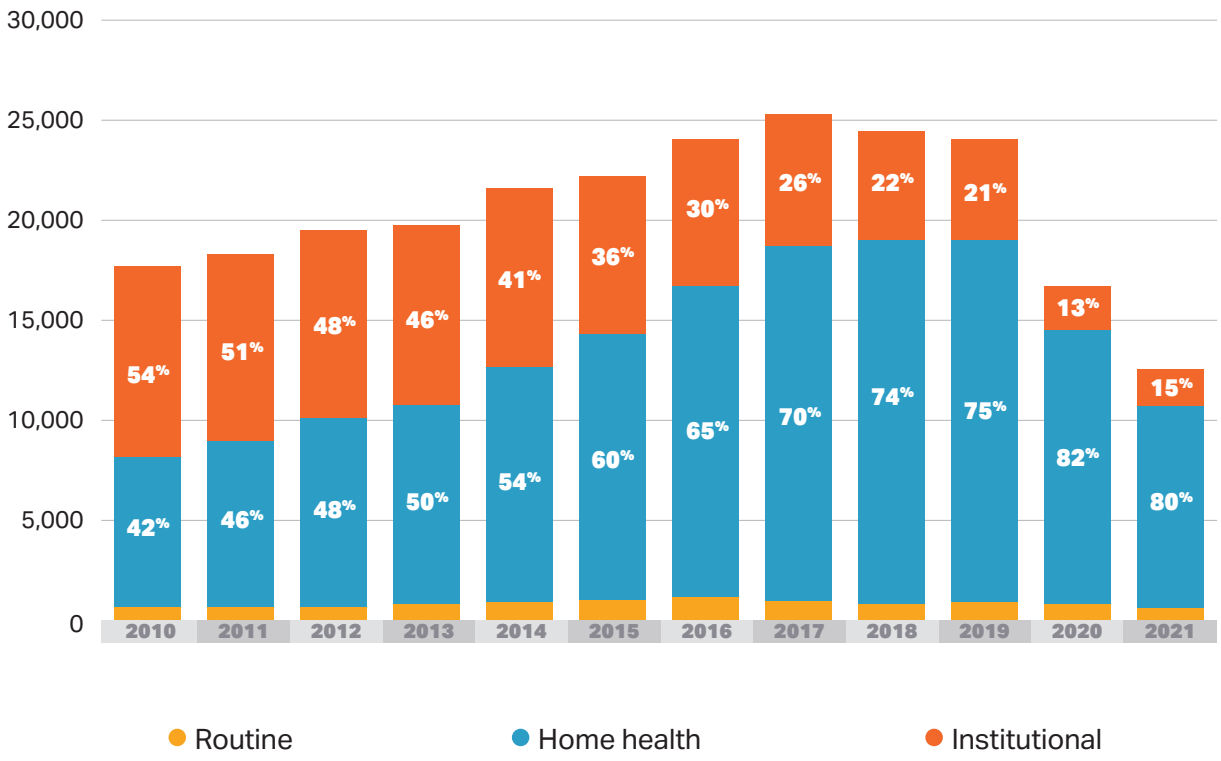


NOTES: Out of state residents and those under 18 are excluded. Institutional post-acute care settings include skilled nursing facilities, inpatient rehabilitation facilities, and long-term care hospitals. Rates adjusted using ordinary least squares (OLS) regression to control for age, sex, and changes in the mix of diagnosis-related groups (DRGs) over time. 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. Sturdy Memorial Hospital was excluded due to missing data. See technical appendix for details.

SOURCES: HPC analysis of Center for Health Information and Analysis Hospital Inpatient Discharge Database, CY2010 – 2021

- The share of hospital stays after which a patient was discharged to institutional post-acute care settings dropped by 3 percentage points from 2019 to 2021, continuing a trend from prior years. Rates are adjusted to control for changes in patient characteristics over time.
- Since 2010, the rate of discharge to institutional PAC has dropped steadily (7.9 percentage points in total); over 80% of the reduction occurred after 2015.
- Conversely, the use of home health has grown in the same period, increasing by 2 percentage points from 2019 to 2021 and 6.9 percentage points in total since 2010.
- Rates of routine discharges have been stable over the decade.

POST-ACUTE CARE IN MASSACHUSETTS FOLLOWING A MAJOR HIP AND KNEE REPLACEMENT (DRG 470), 2010–2021

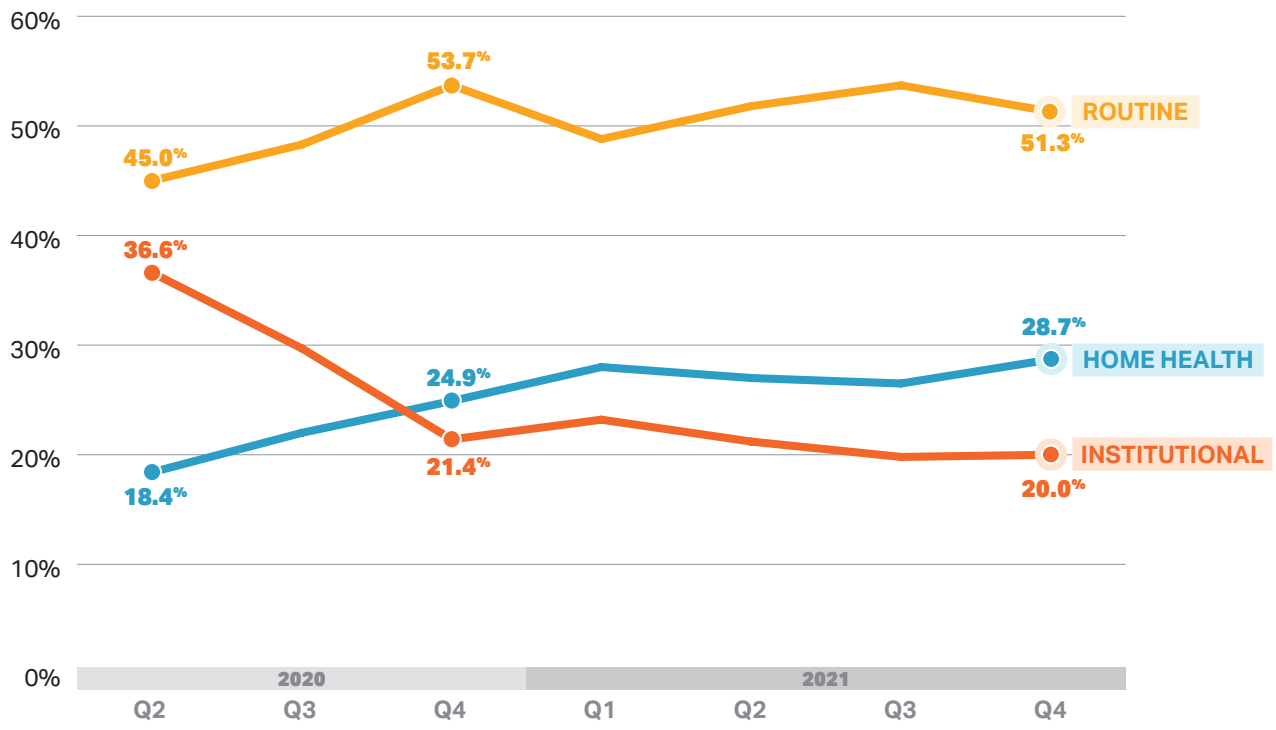


NOTES: While the majority of hip & knee surgeries are found within DRG 470, some of these surgeries may fall into other categories including the introduction of new DRGs in 2020. Q4 2021 data are preliminary. Out of state residents and those under 18 are excluded. Institutional post-acute care settings include skilled nursing facilities, inpatient rehabilitation facilities, and long-term care hospitals. 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. Sturdy Memorial Hospital was excluded due to missing data. See technical appendix for details.

SOURCES: HPC analysis of Center for Health Information and Analysis Hospital Inpatient Discharge Database, CY2010 – 2021

- Changes in discharge patterns for major hip and knee replacement surgeries have been a main driver of the overall shift to home health from institutional PAC in Massachusetts.
- In 2010, less than half of major hip and knee replacements resulted in the use of home health. By 2020, the rate had nearly doubled, reaching over 80%.
- However, home health use for these procedures did not increase further in 2021, suggesting that this multi-year trend may have stabilized.
- The total volume of major hip and knee replacements dropped significantly in 2020 at the onset of the COVID-19 pandemic and continued to decline in 2021. The HPC will continue to investigate patterns in inpatient stays for major hip and knee surgery and investigate changes in outpatient utilization for similar procedures.

POST-ACUTE CARE IN MASSACHUSETTS AFTER A COVID-19-RELATED HOSPITALIZATION, 2020–2021



NOTES: Included in-state adult residents who had either a primary or secondary COVID diagnoses (ICD-10 diagnosis code U07.1). 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. 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. Sturdy Memorial Hospital was excluded due to missing data.

SOURCES: HPC analysis of Center for Health Information and Analysis Hospital Inpatient Discharge Database, CY2010 – 2021

- At the beginning of the COVID-19 pandemic, 36.6% of COVID-19 related hospital stays (defined as hospitalizations with a primary or secondary diagnosis of COVID-19) led to a discharge to an institutional PAC setting. This rate decreased by roughly 15 percentage points to 21.4% by the 4th quarter of 2020. Over the same time period, home health use increased from 18.4% to 24.9%. These rates appear to have stabilized by the end of 2021.
- The shift away from institutional settings toward home health in 2020 may reflect a number of factors, such as an overall reduction in acuity of COVID-19 cases as well as changes in provider case management policies.

PROVIDER ORGANIZATION PERFORMANCE VARIATION

KEY FINDINGS

PROVIDER ORGANIZATION PERFORMANCE VARIATION

- Spending associated with individuals attributed to MGB primary care providers has diverged from other groups over the past five years, growing 5.7% annually between 2015 and 2019 and 4.2% annually from 2015 to 2020. In 2020, MGB-attributed patients had unadjusted total medical spending ($8,395) that was 21% higher than the next highest-spending group (UMass; $6,933). In 2015, MGB primary care patients had spending only 3% above the next-highest group.

- MGB primary care patients also had the highest medical claims spending in 2019 after adjusting for patient age, sex, health status, payer, product, and community-level variables related to socio-economic status. This adjusted spending averaged $6,597, 33% higher than the lowest spending group, Southcoast-attributed patients ($4,960).

- Hospital outpatient spending was the category of care with the greatest spending variation, from $2,661 for MGB-attributed patients to $1,110 for Reliant-attributed patients.

- The percentage of ED visits classified as potentially avoidable varied from 21% to 29% across provider organizations. The average rate of potentially avoidable visits was 46 per 1,000 patients, with rates by provider organization ranging from 79 (Boston Medical Center-attributed patients) to 34 (Atrius-attributed patients).

- Patients attributed to Signature Brockton had the highest total rates of imaging for both CT and MRI encounters in 2019. CT utilization was 175 encounters per 1,000 attributed patients, 15% above the average of 151 and 28% above MACIPA-attributed patients (136 CT encounters). For MRI encounters, Signature-attributed patients were 10% above the average of 118 MRI encounters per 1,000 attributed patients and 29% above Reliant-attributed patients (101 encounters).

- Signature-attributed patients had the highest rate of certain services treated in HOPD settings that can be safely provided in either HOPD or office settings (75%), 62 percentage points above Atrius-attributed patients (13%).

- Provision of nine low value screening, testing, and imaging services was relatively common in Massachusetts in 2019, often reaching as high as a third of patients who could have potentially received the service. For example, roughly one in four patients received unnecessarily laboratory testing prior to low-risk surgeries. Provision of low value care varied across provider organizations typically by a factor of two or more.

INTRODUCTION

PROVIDER ORGANIZATION PERFORMANCE VARIATION

This section of the Chartpack analyzes the performance of provider organizations in the Commonwealth and includes measures of medical spending, inpatient and emergency department (ED) utilization, preventative care utilization, and low value care. Analyzing variation in performance between provider organizations across a range of spending and utilization measures allows for identification of areas for improvement in efficiency and care delivery across the Commonwealth.

These analyses rely on attribution of patients to a primary care provider (PCP) (referred to in this Chartpack as PCP-attributed patients) based on data in the Massachusetts All-Payer Claims Database (APCD), and attribution of PCPs to their affiliated provider organization based on data from the 2019 Registration of Provider Organizations (RPO). The RPO data was supplemented with a 2019 commercial database obtained from IQVIA, which has information on additional Massachusetts providers including nurse practitioners. Details of the methodology have been previously published1[1] and can also be found in the technical appendix.

For most of this Chartpack, the HPC reports on 2019 results because 2020 was a highly unusual year, and comparisons among provider groups in 2020 might reflect differences in how their populations experienced the COVID-19 pandemic.

Using the attribution methodology, we report on a cohort of patients with commercial insurance through Blue Cross Blue Shield of Massachusetts, Tufts Health Plan, Harvard Pilgrim Health Plan, Anthem, and Allways who were attributed to PCPs affiliated with one of the fourteen largest provider organizations in the state. The 2019 cohort was approximately 850,000 patients. The 2020 cohort was approximately 800,000 patients.

All results in this section (with the exception of total medical spending, categorical spending, and 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.

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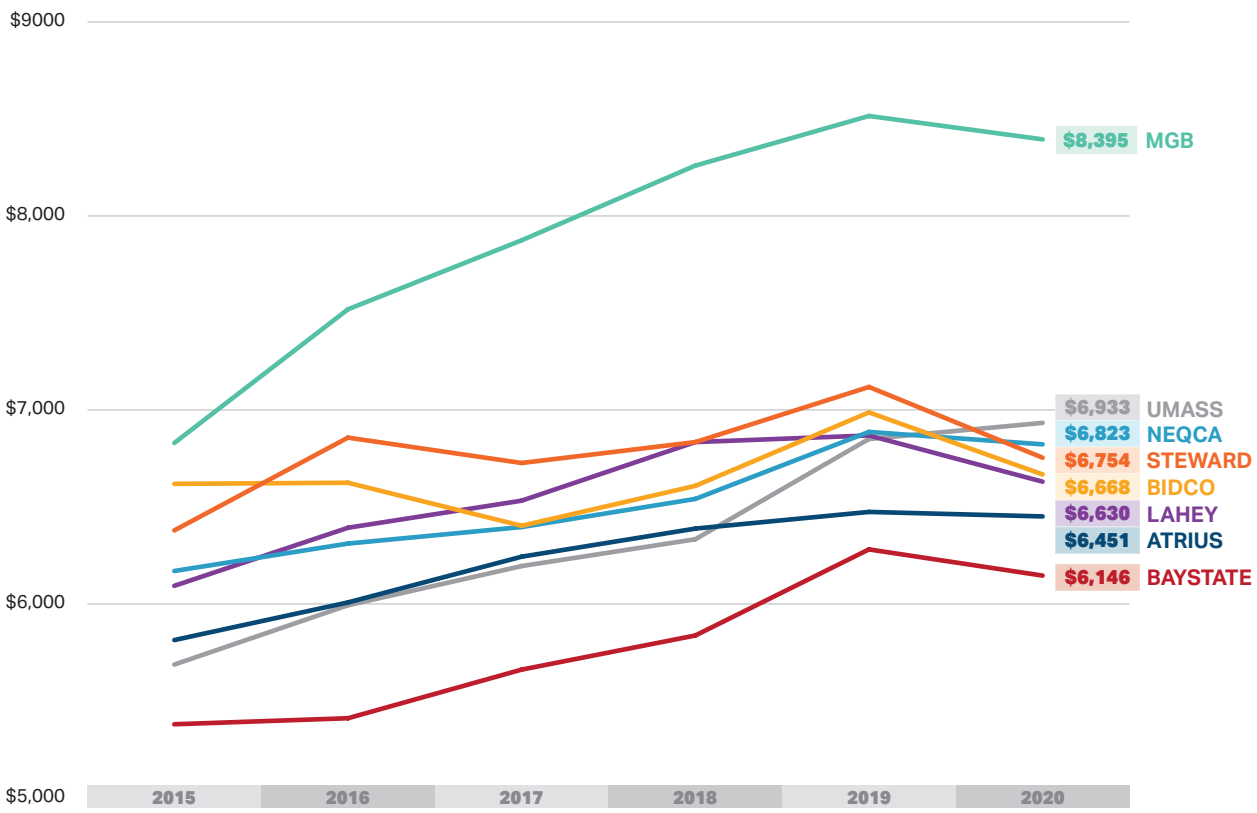
1 Massachusetts Health Policy Commission. 2017 Cost Trends Report. March 2018.

UNADJUSTED TOTAL MEDICAL SPENDING PER MEMBER PER YEAR BY PROVIDER ORGANIZATION FOR THE EIGHT LARGEST PROVIDER GROUPS, 2015–2020



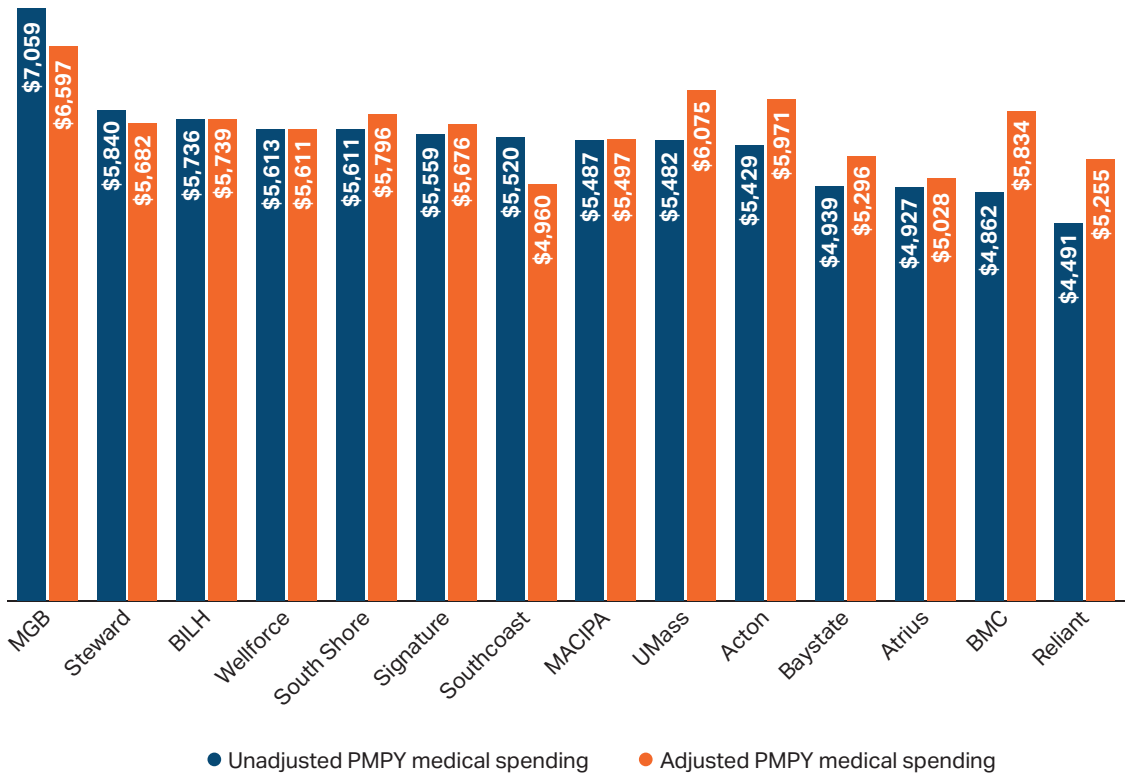
NOTES: Partners HealthCare changed its name to Mass General Brigham (MGB) in 2019

SOURCES: HPC analysis of Center for Health Information and Analysis 2018, 2019, 2021, and 2022 Annual Report TME Databooks

- Spending associated with individuals attributed to MGB primary care providers has diverged from other groups over the past five years, growing 5.7% annually between 2015 and 2019 and 4.2% annually from 2015 to 2020. MGB-attributed individuals had the highest unadjusted total medical spending in 2020 ($8,395), 21% higher than the next highest-spending group (UMass; $6,933). In 2015, MGB primary care patients had spending only 3% above the next-highest group.
- Spending for patients attributed to the other seven largest provider organizations compressed in range between 2015 and 2020 from a difference of 23% between the organizations with highest and lowest spending in 2015 to 13%.

POPV

UNADJUSTED AND ADJUSTED MEDICAL CLAIMS SPENDING PER MEMBER PER YEAR (EXCLUDING PRESCRIPTION DRUG SPENDING) BY PROVIDER ORGANIZATION, 2019



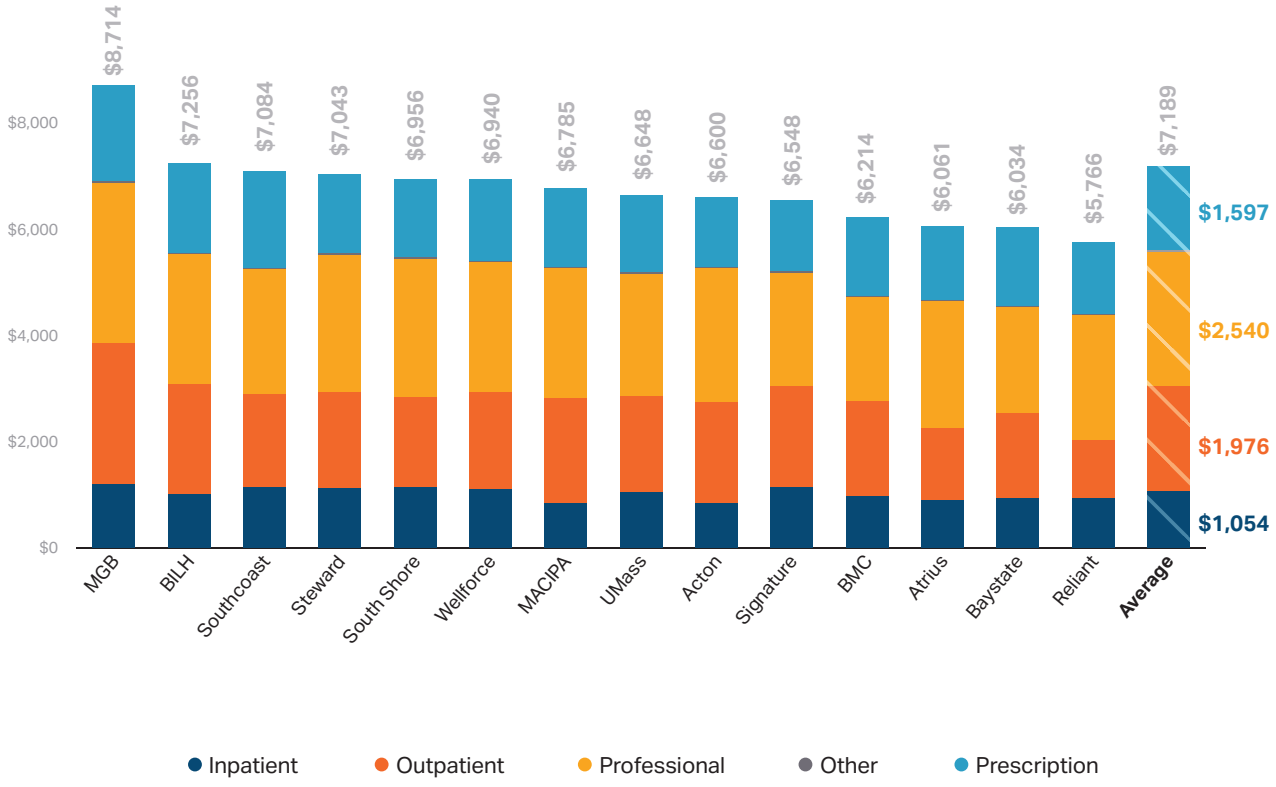
NOTES: PMPY: Per member per year. Prescription drug spending and non-claims-based spending excluded. Spending results are for commercial attributed adults with 12 months of continual medical insurance coverage (N=852,776). BILH is the consolidated previous organizations of BIDCO and Lahey. Prescription drug spending is excluded from this analysis to increase the size of the population included in the analysis, as not all patients with 12 months of continual medical coverage had 12 months of continual prescription drug insurance coverage. Health status adjustment has been processed by software called The Johns Hopkins ACG® System © 1990, 2017, Johns Hopkins University. All Rights Reserved. Average is calculated across provider organizations. See technical appendix for details.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2019

- Using APCD data, the HPC calculated unadjusted medical spending by provider organization and adjusted results for differences in age, sex, health status, payer, product, and community-level variables related to socioeconomic status. Differences between adjusted and unadjusted spending by organization could also be affected by differences in coding behavior.
- MGB-attributed patients had the highest unadjusted and adjusted total medical spending in 2019. At $6,597 per member per year (PMPY), MGB-attributed adjusted spending was 9% higher than the next highest group (UMass-attributed patients), 17% higher than the average of the groups shown here ($5,644), and 33% higher than the lowest spending group (Southcoast-attributed patients).
- Differences in unadjusted spending were greater than differences in adjusted spending. MGB-attributed patients had unadjusted spending 57% higher than spending for Reliant-attributed patients.

POPV

UNADJUSTED TOTAL MEDICAL CLAIMS SPENDING PER MEMBER PER YEAR BY CATEGORY OF SPENDING AND PROVIDER ORGANIZATION, 2019



- Average unadjusted per member per year (PMPY) spending was $7,189 when including prescription drug spending. MGB-attributed patients had the highest PMPY spending at $8,714 and Reliant-attributed had the lowest at $5,766.
- MGB-attributed patients had the highest spending in every category of care: inpatient spending at $1,192 (13% above the average of $1,054); hospital outpatient spending at $2,661 (35% above the average); professional spending at $3,021 (19% above the average); prescription drug spending at $1,816 (14% above the average).
- Hospital outpatient spending had the highest variation across provider groups by percentage (140% between MGB and Reliant) and by dollar amount ($1,551). Prescription drug spending had the least variation across groups by percentage (39% between MGB and Acton) followed by hospital inpatient spending (42% between MGB and MACIPA).

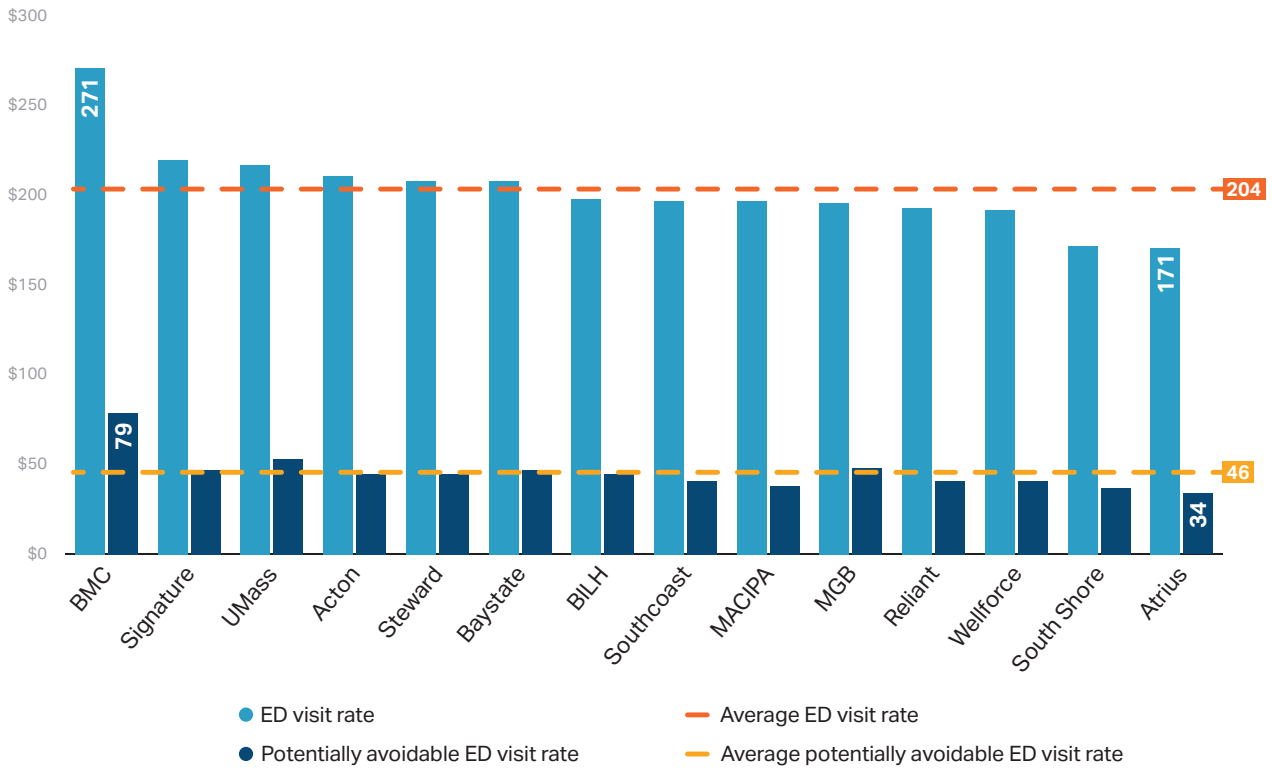
NOTES: PMPY: Per member per year. Individuals without 12 months of prescription drug insurance coverage were excluded. Spending results are for commercial attributed adults with 12 months of continual medical insurance coverage (N=660,713). Average is calculated by total spending by category divided by total population. See technical appendix for more details. Hospital inpatient and outpatient spending include facility spending only. Professional spending associated with these sites of care is included in "Professional".

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2019

POPV

TOTAL AND POTENTIALLY AVOIDABLE EMERGENCY DEPARTMENT UTILIZATION, 2019

Adjusted visits per 1,000 attributed commercial patients



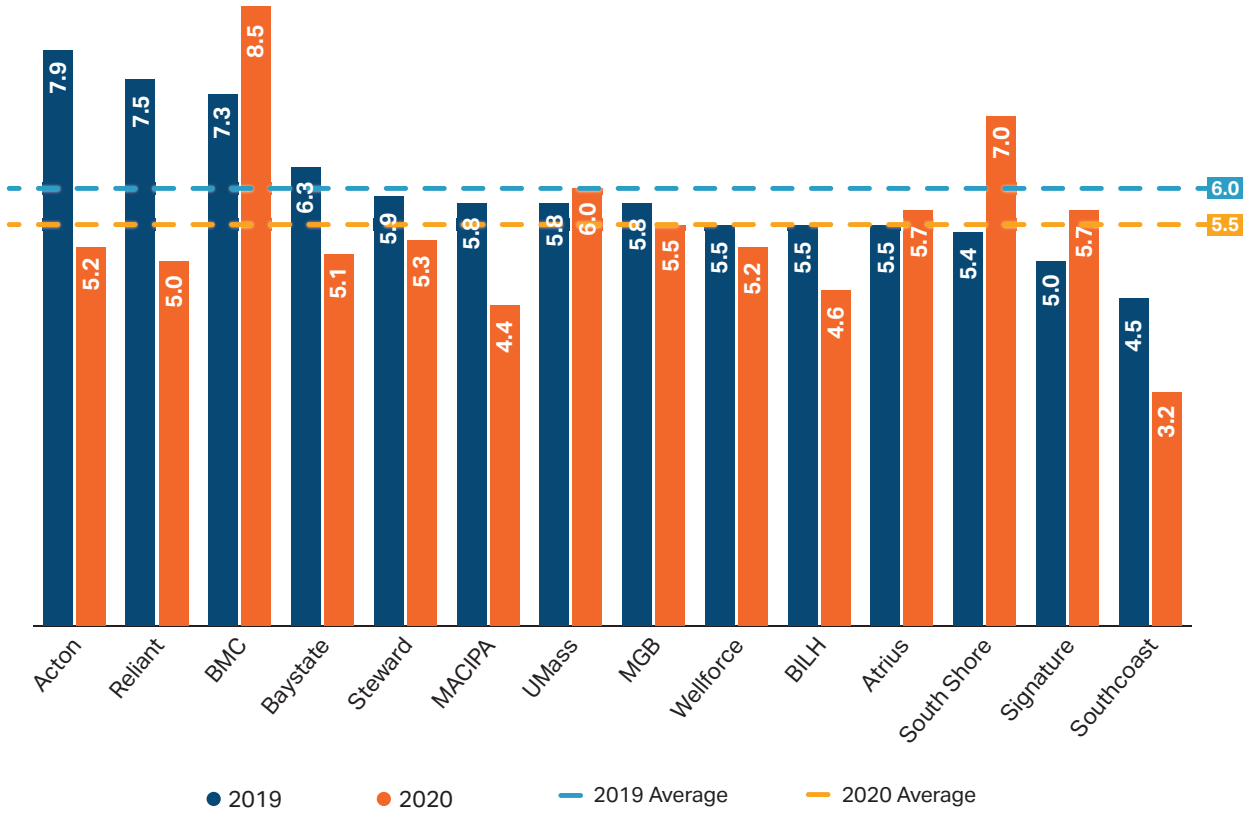
NOTES: Potentially avoidable ED visits are based on the Billings algorithm. Results reflect commercial attributed adults, at least 18 years of age with 12 months of continual medical insurance coverage (N=852,776). Results are adjusted for differences in age, sex, health status, and community-level variables related to education and socioeconomic status. Average is calculated across provider organizations. See technical appendix for details.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2019

- Overall ED utilization and potentially avoidable ED utilization may indicate inefficient use of acute care resources, as well as opportunities to improve access to primary care, urgent care, and other community resources.
- The adjusted average commercial ED utilization rate across providers was 204 ED visits per 1,000 attributed commercial patients. ED utilization varied by 58% among provider organizations, from 271 among patients attributed to Boston Medical Center-affiliated PCPs to 171 among patients attributed to Atrius-affiliated PCPs.
- The percentage of ED visits classified as potentially avoidable varied from 20% to 29% across organizations. The average rate of potentially avoidable visits was 46 per 1,000 patients, with rates by organization ranging from 79 (Boston Medical Center-attributed patients) to 34 (Atrius-attributed patients).
- In 2020, across organizations, the average ED visit rate decreased by 19%, while potentially avoidable ED visits decreased by 26%. ED rates varied by 54% between BMC-attributed patients (223) to Atrius-attributed patients (144). Patients attributed to BMC, Signature, UMass, MGB, and Baystate were above the 2020 average of 34 potentially avoidable ED visits per 1,000 patients. The five lowest patient-attributed provider groups for 2020 ED visit rates were BILH, Reliant, Wellforce, South Shore, and Atrius.

MENTAL HEALTH-RELATED EMERGENCY DEPARTMENT UTILIZATION, 2019 AND 2020

Adjusted visits per 1,000 attributed commercial patients



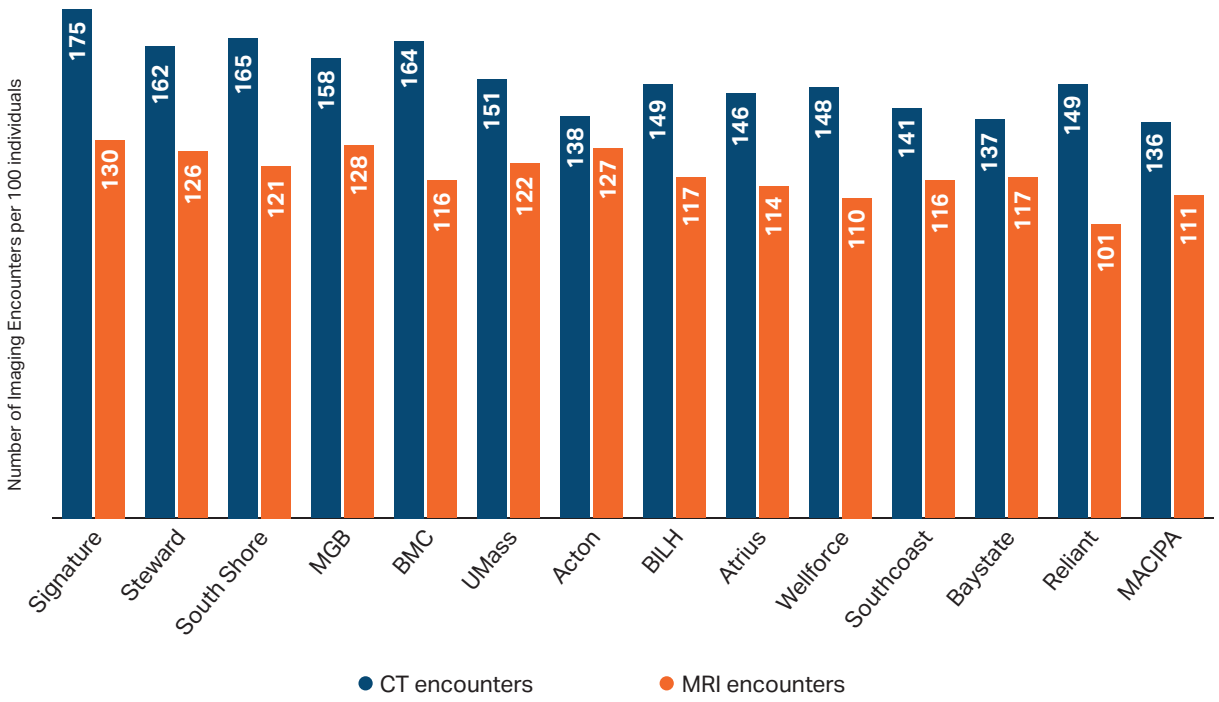
NOTES: MH visits were defined using AHRQ CCSR MBD001-MDB034. Results reflect commercial attributed adults, at least 18 years of age with 12 months of continual medical insurance coverage (2019 N=852,776 2020 N=781,157). Results are adjusted for differences in age, sex, health status, and community-level variables related to education and socioeconomic status. Average is calculated across provider organizations. See technical appendix for details.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2019 and 2020

- Mental health-related ED utilization may indicate poor access to outpatient behavioral health care, as some patients may seek care in the ED if care in other settings is not available to address or manage their behavioral health needs.
- In 2019, Acton-attributed patients had the highest rate of mental health-related ED visits at 7.9 per 1,000, while Southcoast-attributed patients had the lowest at 4.5 per 1,000.
- The average change in mental health-related ED utilization from 2019 to 2020 was a decrease of 7.5%. However, there was some variation among provider organizations. For example, South Shore-, BMC-, and Signature-attributed patients had increases in mental health-related ED utilization from 2019 to 2020 at 24%, 14%, and 3%, respectively. Meanwhile, Southcoast-attributed patients had the largest decreases in mental health-related ED utilization from 2019 to 2020, 39%.

CT AND MRI ENCOUNTERS PER 1,000 PATIENTS, 2019

Adjusted visits per 1,000 attributed commercial patients



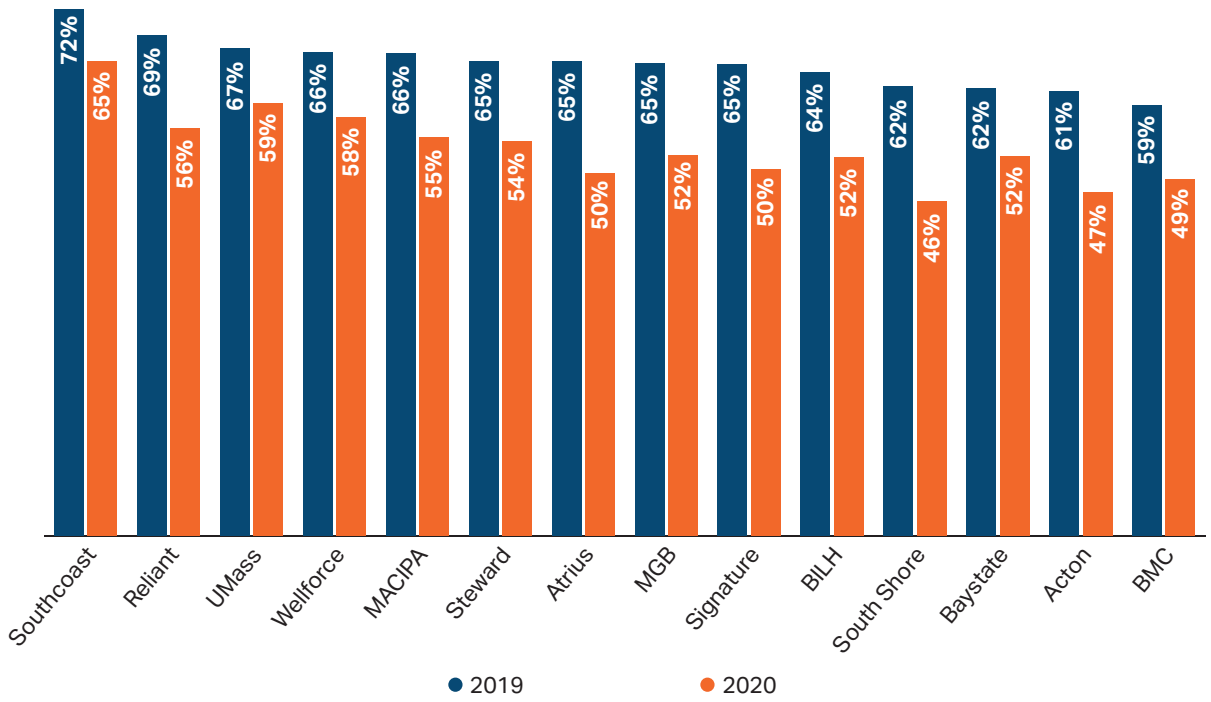
NOTES: (1) Mafi et al. (2021). Trends in low-value health service use and spending in the US Medicare fee-for-service program, 2014-2018. JAMA, 4(2). Results reflect commercial attributed adults, at least 18 years of age with 12 months of continual medical insurance coverage (N=852,776). Results are adjusted for differences in age, sex, health status, and community-level variables related to education and socioeconomic status. Average is calculated across provider organizations. See technical appendix for details.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2019

- CT and MRI imaging are high-cost services. Literature indicates that imaging is also frequently an overused service.[1] Variation in utilization rates, adjusted for patient characteristics, suggests opportunities for more appropriate use of imaging services.
- Patients attributed to Signature Brockton had the highest total rates of imaging for both CT and MRI encounters in 2019. CT utilization was 175 encounters per 1,000 attributed patients, 15% above the average of 151 and 28% above the lowest rate, which was among patients attributed to MACIPA (136 encounters per 1,000).
- For MRI encounters, Signature-attributed patients were 10% above the average of 118 encounters per 1,000 attributed patients and 29% above the lowest rate, which was among patients attributed to Reliant (101 encounters per 1,000).
- In 2020, the average decrease across provider organizations was 12% for CT scans and 17% for MRIs (133 and 98).

POPV

PERCENTAGE OF WOMEN OVER 45 THAT RECEIVED ANY BREAST CANCER SCREENINGS IN 2019 AND 2020



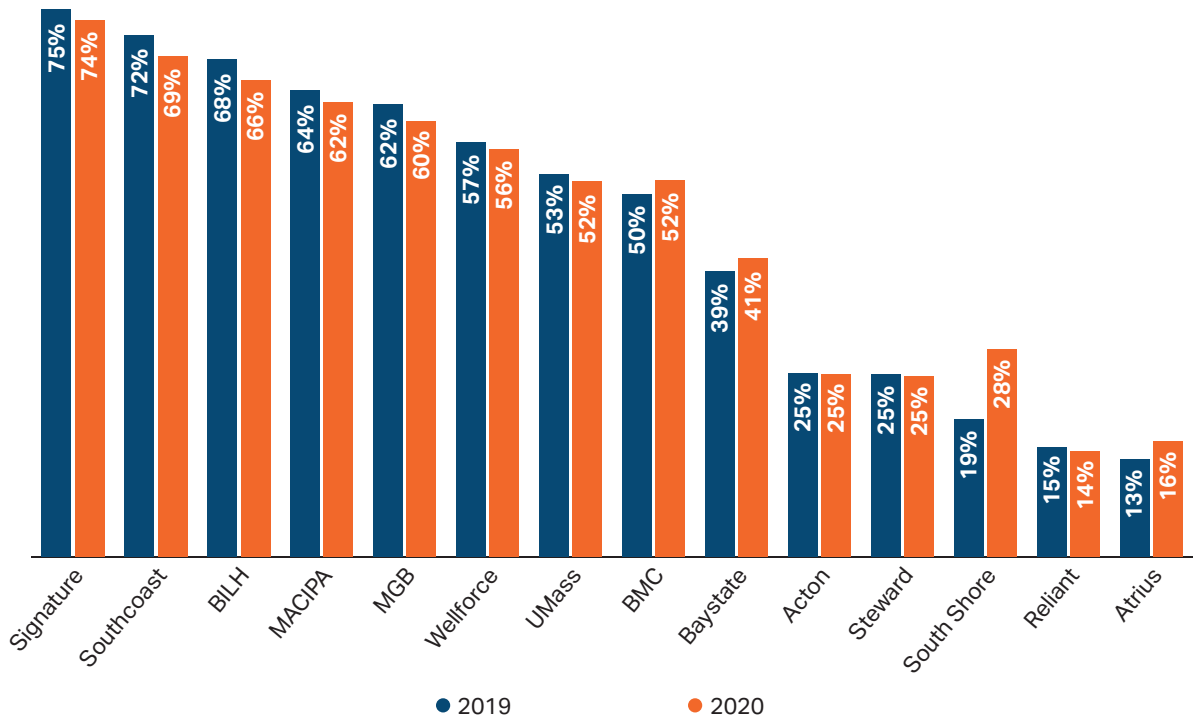
NOTES: The APCD 2019 and 2020 populations were restricted to women between the ages of 45 and 64 with 12 months of continual medical insurance coverage (2019 N = 208,652, 2020 N= 187,464). Preventative breast cancer screenings were measured using screening-specific CPT codes. Imaging codes that do not differentiate between screening and diagnostic procedures were subjected to a screening identification algorithm based on previous work by Wernli et al., 2020. Average is calculated across provider organizations. See technical appendix for details.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2018, 2019, and 2020. Wernli, et al. (2020). Trends in screening breast magnetic resonance imaging use among US women, 2006 to 2016. Cancer, 126(24), 5293-5302.

- The HPC recorded the percentage of women over age 45 (adjusted for patient characteristics) with any preventative breast cancer screening in 2019 and 2020.
- Among these provider organizations, Southcoast-attributed patients had the highest rate of breast cancer screening in 2019, with 72% of women above the age of 45. This was 7 percentage points above the average (65) and 13 percentage points above the rate for BMC-attributed patients (59).
- In 2020, across all provider organizations, there was an average decrease of 18 percentage points in the percentage of women with any preventative breast cancer screening per 100 women above the age of 45.

POPV

PERCENT OF SELECT ENCOUNTERS AT A HOPD LOCATION, ADJUSTED 2019 AND 2020



NOTES: Results reflect commercial attributed adults, at least 18 years of age that received at least one of 451 procedure codes with the potential for service at a HOPD location, either in professional claims or potentially HOPD lab services. The parameters for these codes was between 20% and 80% of possible service locations being HOPD locations and with at least 100 encounters by volume for each procedure code. Results reflect commercial attributed adults, at least 18 years of age with 12 months of continual medical insurance coverage (2019 N=681,747 2020 N=561,741). Results are adjusted for differences in age, sex, health status, and community-level variables related to education and socioeconomic status. Average is calculated across provider organizations. See technical appendix for details.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2019 and 2020.

- The HPC analyzed the percentage of certain service encounters that took place at a hospital outpatient department (HOPD) which could have taken place at either an office or HOPD setting. A HOPD is typically a higher-cost site of service than a provider office, especially with the addition of a "facility fee." While some of these services may be most appropriately provided in a HOPD, variation strongly suggests opportunities for more efficient use of the higher-cost site of service.
- Across provider groups, after adjusting for differences in age, sex, health status, and community-level variables related to education and socioeconomic status, the average percentage of these service encounters that took place in a HOPD was 46%.
- Signature-attributed patients had the highest rate of these service encounters occurring at HOPDs. At 75%, this rate was 62 percentage points above that of Atrius-attributed patients, which had the lowest rate of HOPD use for these service encounters at 13%.
- Rates of HOPD use for these service encounters did not change appreciably between 2019 and 2020. Across providers, the average change was 0%.

LOW VALUE CARE INTRODUCTION

Low value care (LVC) in this section refers to medical services recognized by clinicians as not based on evidence and typically unnecessary for any patient, based on research compiled in the Choosing Wisely® recommendations.[1] Provision of these services to patients often involves additional unnecessary follow-up care ("cost cascades"),[2] financial cost, medical risk (in some cases), time and physical or emotional distress with little or no clinical benefit. Over the years, researchers have established algorithms to identify some of these services in claims databases such as the APCD[3], though many other low-value care services are best identified using electronic health records that includes information such as lab values and family medical history. While LVC services identified in this manner may not represent a large portion of overall medical spending, or even necessarily a large portion of all LVC services, the services highlighted in this section can act as a focal point for sharing best evidence-based practices and orienting health systems toward patient well-being.[4]

In the previous two Cost Trends Reports, the HPC focused on seven LVC measures across three domains (screening, pre-operative, and procedures), using commercial claims data for 2017 and 2018, respectively.[5,6] The following charts report on these same measures using claims data from 2019 and 2020. In addition, this year's section adds a new LVC domain, imaging, and two new LVC measures: low value DEXA bone density scans and brain imaging for simple syncope.

The HPC selected these nine measures based on 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. Specific codes and sources for all measures can be found in the technical appendix of this report. While the measures presented do not capture the full extent of LVC in the Commonwealth, they are illustrative of the prevalence of such care, the variation in care, and the associated spending in the Massachusetts commercial population.

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1 Choosing Wisely®. ABIM Foundation; 2022. https://abimfoundation.org/what-we-do/choosing-wisely.

2 Ganguli, I., Lupo, C., Mainor, A. J., et al (2019). Prevalence and cost of care cascades after low-value preoperative electrocardiogram for cataract surgery in fee-for-service Medicare beneficiaries. JAMA internal medicine, 179(9), 1211-1219.

3 Schwartz, A. L., Jena, A. B., Zaslavsky, A. M., & McWilliams, J. M. (2019). Analysis of physician variation in provision of low-value services. JAMA internal medicine, 179(1), 16-25.

4 Beckman, H., Mafi J., and Bortz B. "A 10-step program to successfully reduce low-value care." The American Journal of Managed Care 27.6 (2021): e208-e213.

5 Massachusetts Health Policy Commission. 2018 Cost Trends Report. February 2019.

6 Massachusetts Health Policy Commission. 2021 Cost Trends Report. September 2021.

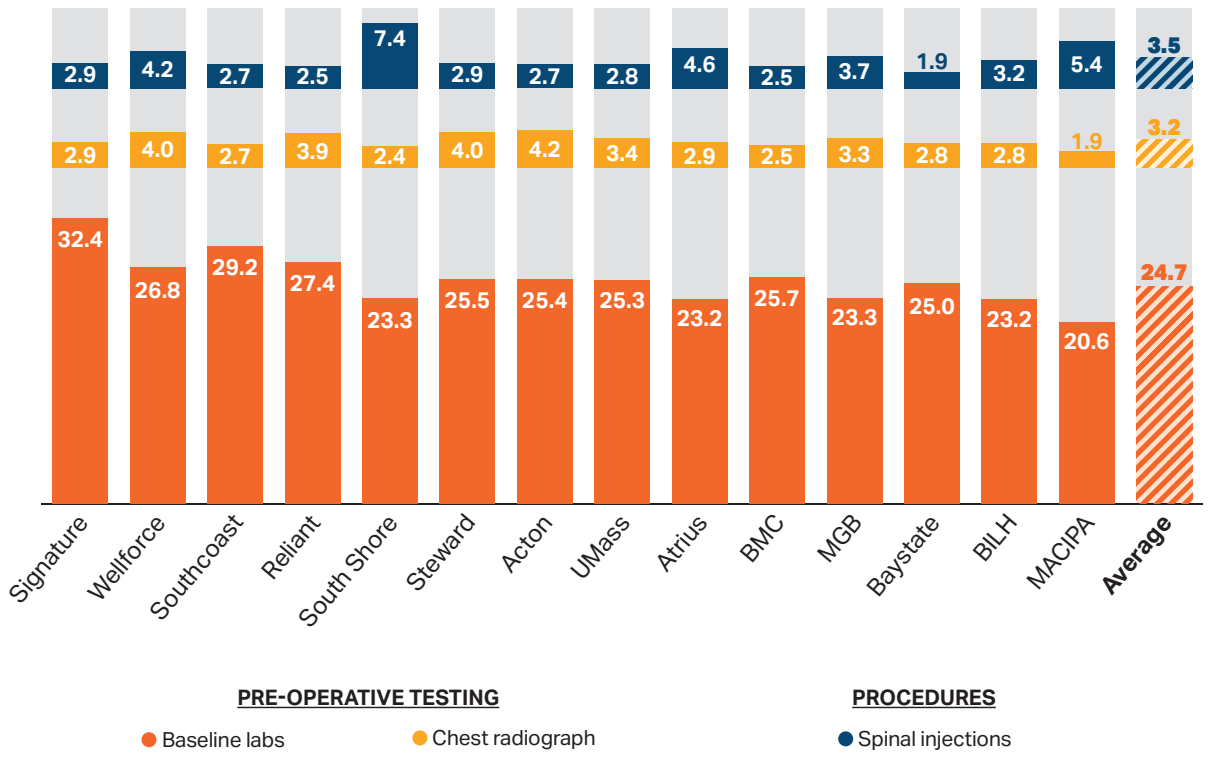
PROVISION OF NINE LOW VALUE CARE SERVICES DECREASED IN 2020 BUT SUBSTANTIAL USE AND VARIATION REMAINED

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
Imaging
Low value DEXA bone density scans
Brain imaging for simple syncope

2019	2020
75,898	**40,396**
Total # of patients with at least 1 LVC service	Total # of patients with at least 1 LVC service
127,141	**78,024**
Total # of LVC services identified	Total # of LVC services identified
2.3:1	**2.1:1**
Variation in LVC spending per 100 eligible members across provider organizations	Variation in LVC spending per 100 eligible members across provider organizations

LOW VALUE PRE-OPERATIVE TESTING AND PROCEDURES: BASELINE LABS, CHEST RADIOGRAPH, SPINAL INJECTIONS, 2019

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



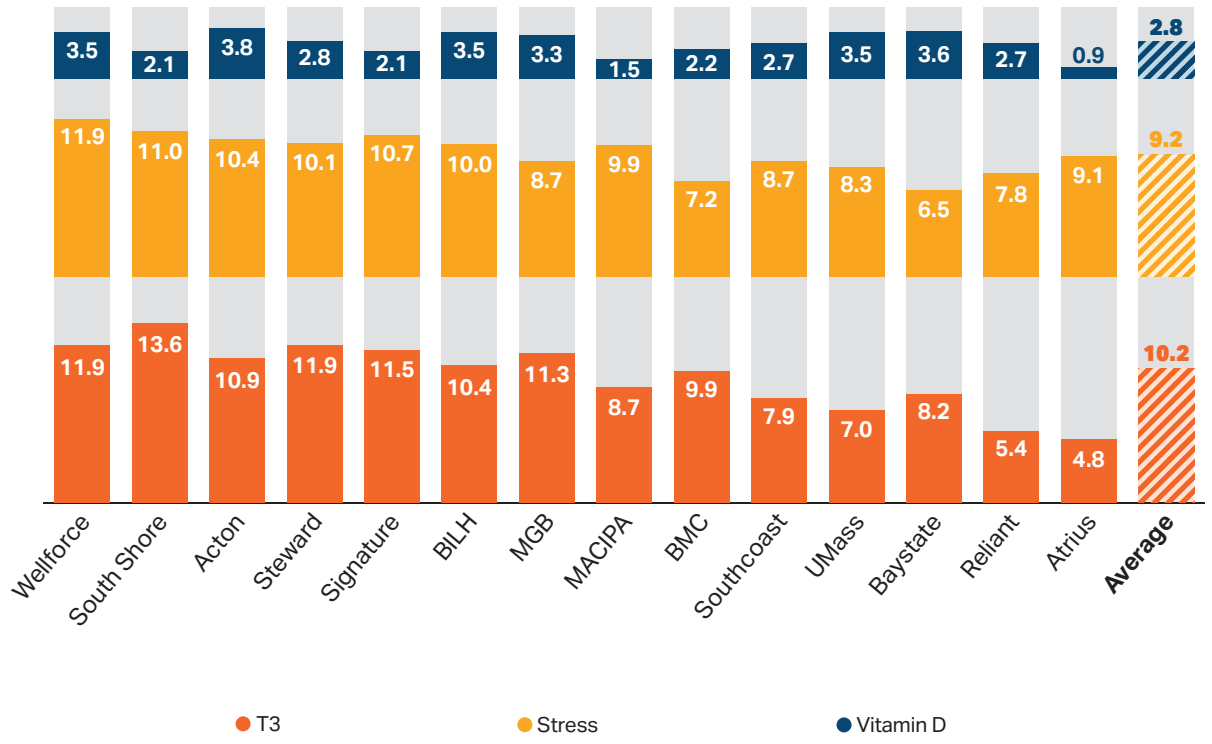
NOTES: Baseline labs = Baseline labs in patients without significant systemic disease undergoing low risk surgery; Chest radiograph = Chest radiographs occurring less than 30 days before a low or intermediate risk non-cardiothoracic surgical procedure (not associated with inpatient or emergency care). 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, total services divided by total eligible members. See technical appendix for details.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2018, 2019, 2020

- In 2019, 18% 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 24.7 lab tests per 100 eligible patients. This rate is a slight decline (3.1%) from the rate in 2018. The rate varied from 21 (MACIPA) to 32 (Signature Brockton).
- Low value chest radiographs and spinal injections were less common, provided to 1.6% and 1.8% of patients, respectively, who could have received these services given their diagnosis and treatment patterns. The average rate for chest radiographs was 3.2 per 100 in 2019, a 19.0% increase from 2018. The average rate for spinal injections in 2019 was 3.5 per 100, a 2.9% increase from 2018. While rates for low value spinal injections were lower than for low value baseline lab tests, the care is more intensive for patients and costly, totaling $2.5 million among this set of patients in 2019 (compared to $1.1 million for low value baseline lab tests).
- In 2020, the average rates of baseline labs were 21.6 per 100 patients, or 12.6% less than in 2019. Rates of chest radiograph averaged 2.5 in 2020, a 22% decrease. Rates of spinal injections averaged 2.8, a 20% decrease).

LOW VALUE SCREENINGS: T3 (THYROID), CARDIAC STRESS, AND VITAMIN D, 2019

Low value screenings per 100 eligible commercial patients



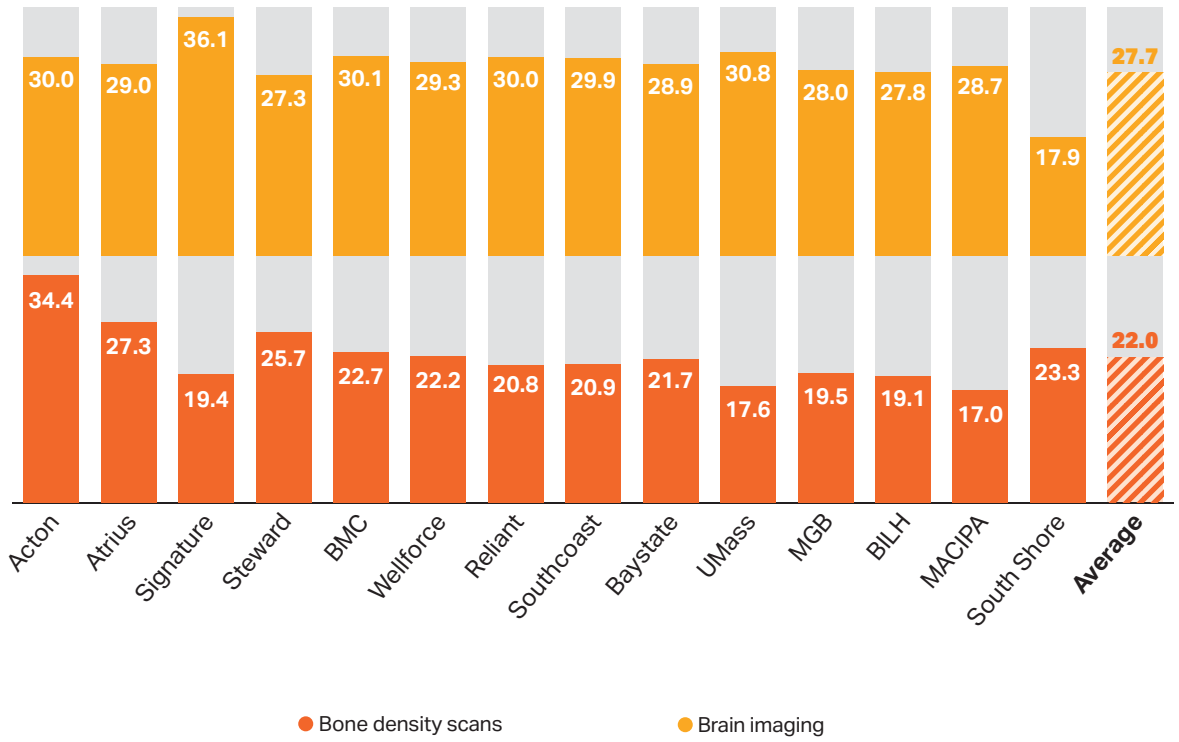
NOTES: T3 = Total or free T3 level measurement in a patient with a hypothyroidism diagnosis during the year; Stress = Stress testing for patients with an established diagnosis of ischemic heart disease or angina at least 6 month before the stress test, and thus not done for screening purposes; Vitamin 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, total services divided by total eligible members. See technical appendix for details.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2018, 2019, 2020

- Low value screenings for patients attributed to the largest provider organizations reflect 38,715 low value encounters across 37,898 patients in 2019. These low value screenings accounted for $3.8 million in spending.
- The average rate of thyroid (T3) testing in 2019 was 10.2 tests per 100 eligible patients, 4.7% less than in 2018. Rates of stress testing averaged 9.2 tests per 100 eligible patients in 2019, a 2.1% decrease from 2018. For Vitamin D testing, which has declined steeply in recent years, rates averaged 2.8 tests per 100 eligible patients in 2019, a 20.0% decrease from 2018.
- Patients attributed to South Shore had the highest rate of low value T3 tests (13.6), 2.9 times the rate for patients attributed to Atrius. Patients attributed to Wellforce had the highest rate of stress tests (11.9), 1.8 times the rate of stress tests among patients attributed to Baystate.
- In 2020, there was a sharp decline in LVC screening rates. The average rate of T3 testing was 9.0, 11.8% less than in 2019. Rates of stress tests averaged 7.3 tests in 2020, a 20.7% decrease. Vitamin D testing rates declined most dramatically to 0.7 tests in 2020, a 75.0% drop from 2019.

LOW VALUE IMAGING PROCEDURES: BONE DENSITY SCANS AND BRAIN IMAGING FOR SIMPLE SYNCOPE, 2019

Low value imaging procedures per 100 eligible commercial patients

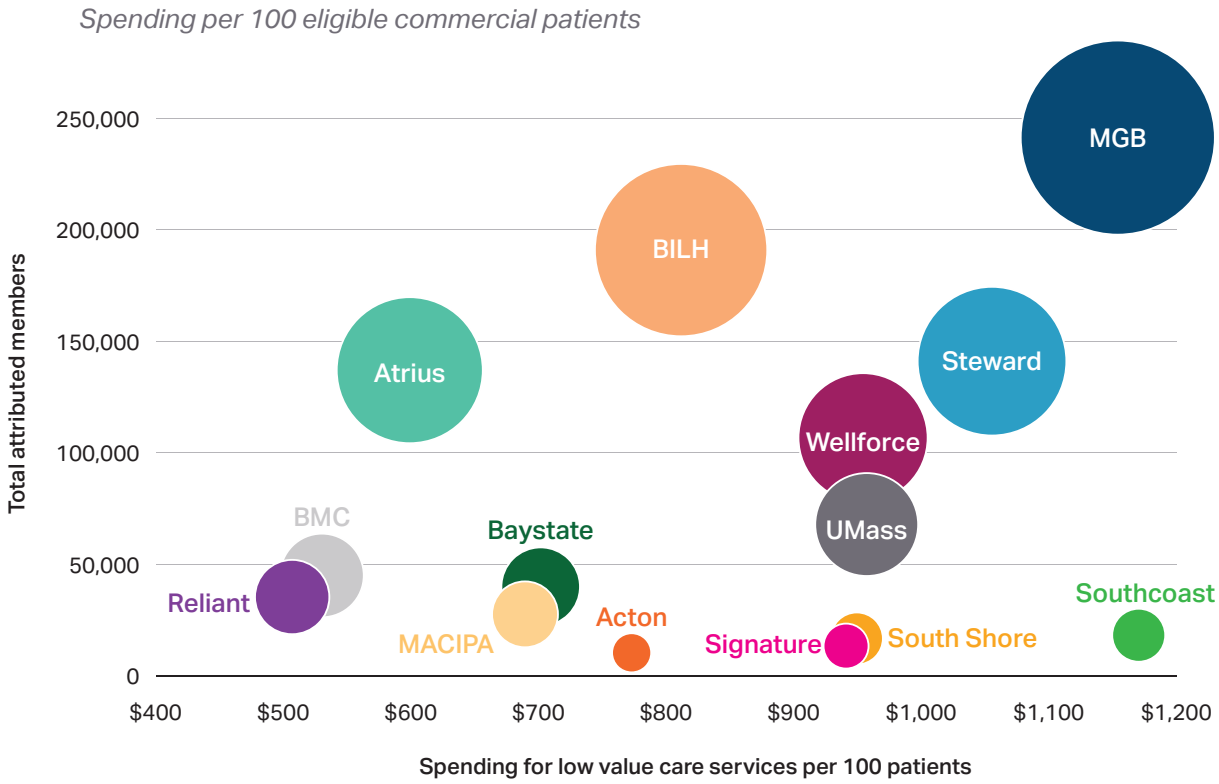


NOTES: DEXA scans = low value DEXA scans (bone density scan). Brain imaging for simple syncope = low value MRI and CT scans for simple syncope. Average reflects rate for all commercial patients, including patients not attributed to a listed provider organization, total services divided by total eligible members. See technical appendix for details.

SOURCES: Mafi et al. (2021). Trends in low-value health service use and spending in the US Medicare fee-for-service program, 2014-2018. JAMA, 4(2). HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database 2018, 2019, and 2020.

- The HPC added two new low-value care measures in this chartpack: DEXA bone density scans and brain imaging for simple syncope. These imaging services were chosen based on a review of relevant literature and Choosing Wisely® recommendations for LVC.
- From 2018 to 2019, the average rate of low-value bone density scans per 100 attributed primary care patients increased by 7.3%, from 20.5 to 22.0. For brain imaging for simple syncope, the average rate per 100 attributed primary care patients increased 5% from 26.4 to 27.7 between 2018 and 2019.
- In 2019, rates of low value bone density scans per 100 attributed primary care patients ranged from 34.4 (Acton) to 17.0 (MACIPA). Rates of brain imaging for simple syncope per 100 attributed patients ranged from 36.1 (Signature) to 17.9 (South Shore).
- Overall, bone density screenings per 100 eligible commercial patients decreased from an average 22.0 in 2019 to 15.9 in 2020.
- Brain imaging for simple syncope per 100 eligible commercial patients decreased from an average 27.7 in 2019 to 22.4 in 2020, a 19.1% drop.

SPENDING FOR NINE LOW VALUE SERVICES PER 100 ATTRIBUTED PATIENTS AND TOTAL NUMBER OF ATTRIBUTED PATIENTS BY PROVIDER ORGANIZATION, 2019



- In this exhibit, the size of the circle is proportional to the total number of patients attributed to each provider organization, which is also reflected on the Y axis.
- Provider organizations are arranged left to right 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.
- Overall, Reliant-attributed patients had the lowest spending on low value services per 100 patients at $506. Southcoast-attributed patients had about 2.3 times higher ($1,170) spending than Reliant-attributed patients. MGB-attributed patients had the second-highest average LVC spending ($1,150) and had the largest total membership size.
- Among these listed providers, the average LVC spending per 100 attributed members for these measures decreased from $895 in 2019 to $677 in 2020, a 24% decline.

NOTES: Low value spending across all 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. Results for the low value stent procedure are not presented by provider organization due to small numbers at some organizations in the two previous charts, but are included here in overall spending. The average in the text is calculated as total LVC spending divided by total attributed members. N=1,090,442. See technical appendix.

SOURCES: HPC analysis of Center for Health Information and Analysis Massachusetts All-Payer Claims Database, 2018, 2019, 2020

POPV

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