2019 HEALTH CARE COST TRENDS REPORT

SELECT FINDINGS

MASSACHUSETTS
HEALTH POLICY COMMISSION

2019 Cost Trends Report: Today's Presentation Outline

Topics

Overview

Trends in:

- Spending
- Affordability

Provider Organization Performance Variation

Metrics including:

- Utilization measures
- Low value care

Hospital Spending and Utilization

Trends in:

- Inpatient severity of illness
- Inpatient commercial volume
- Outpatient spending growth

Select Findings from the 2019 Cost Trends Report

Topics

Overview

Trends in spending, premiums, and affordability

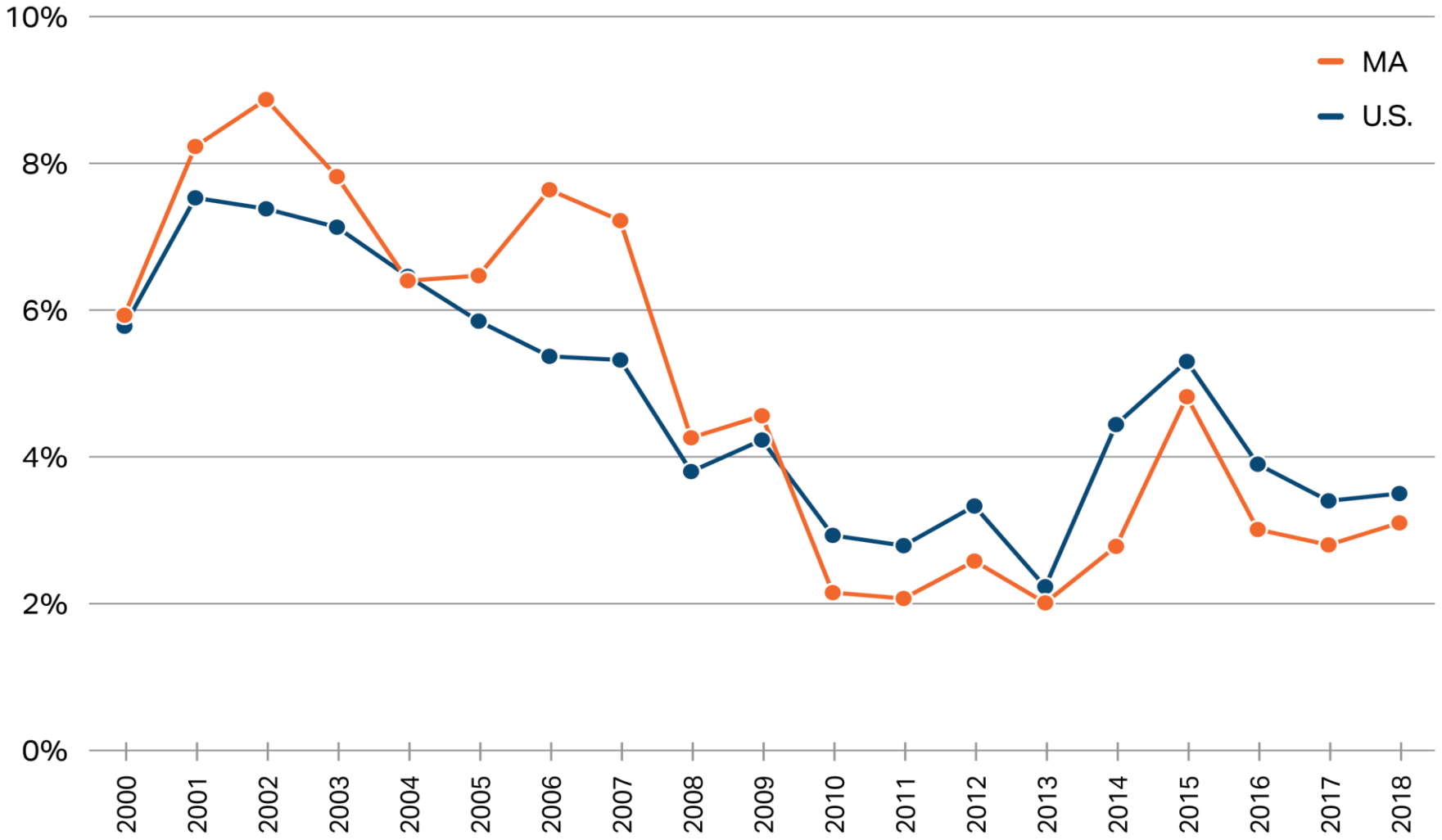
Provider Organization Performance Variation

Hospital Spending and Utilization

HPC

Since 2009, total healthcare spending growth in Massachusetts has been below the national rate.

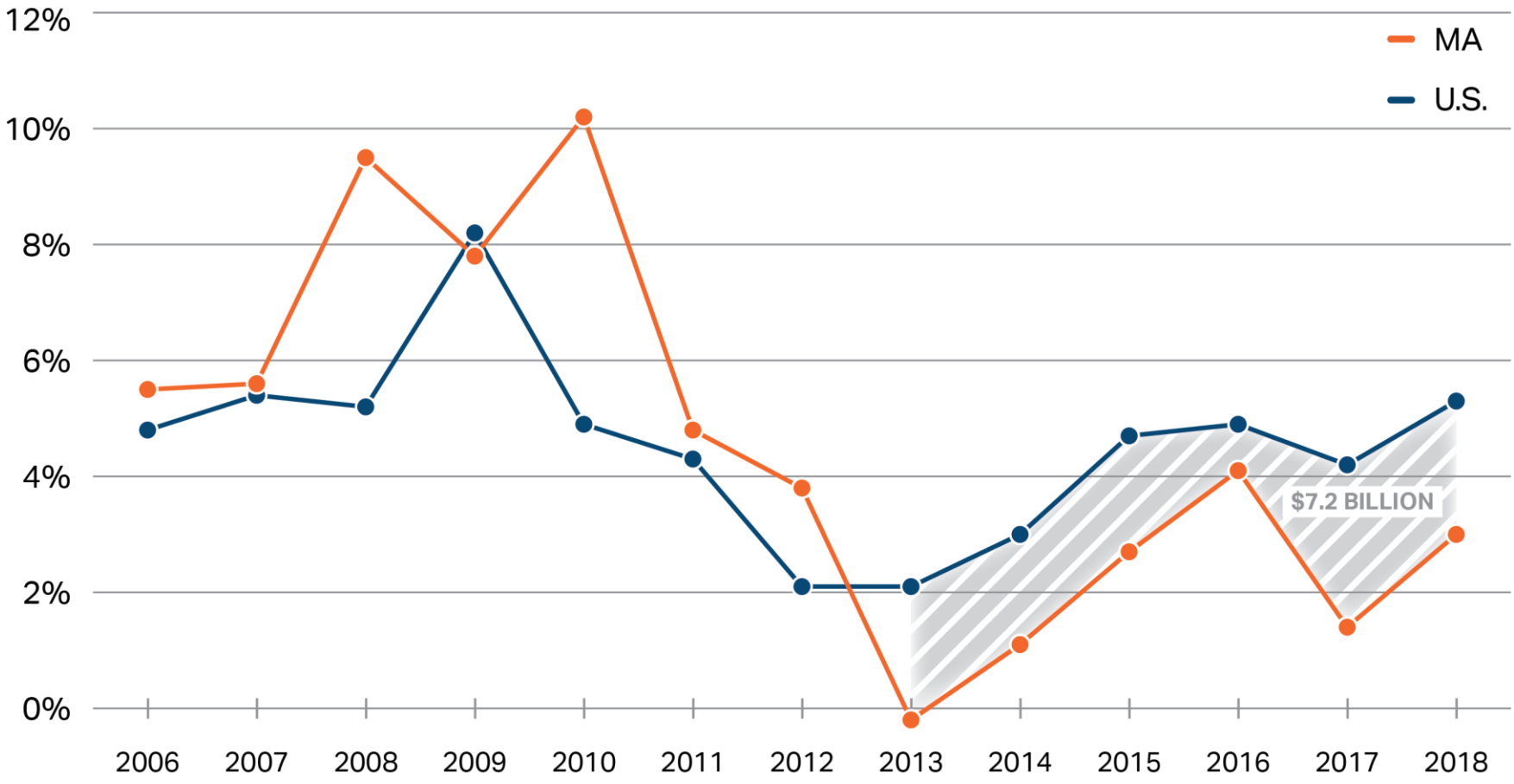
Annual growth in per capita healthcare spending, Massachusetts and the U.S., 2000-2018



Notes: U.S. data includes MA. MA data point for 2018 is preliminary.
Sources: CMS National Healthcare Expenditure Accounts, Personal Health Care Expenditures Data (U.S. 2014-2018) ; CMS State Healthcare Expenditure Accounts (U.S. 2000-2014 and MA 2000-2014); CHIA Annual Report THCE Databooks (MA 2014-2018).

Commercial spending growth in Massachusetts has been below the national rate every year since 2013.

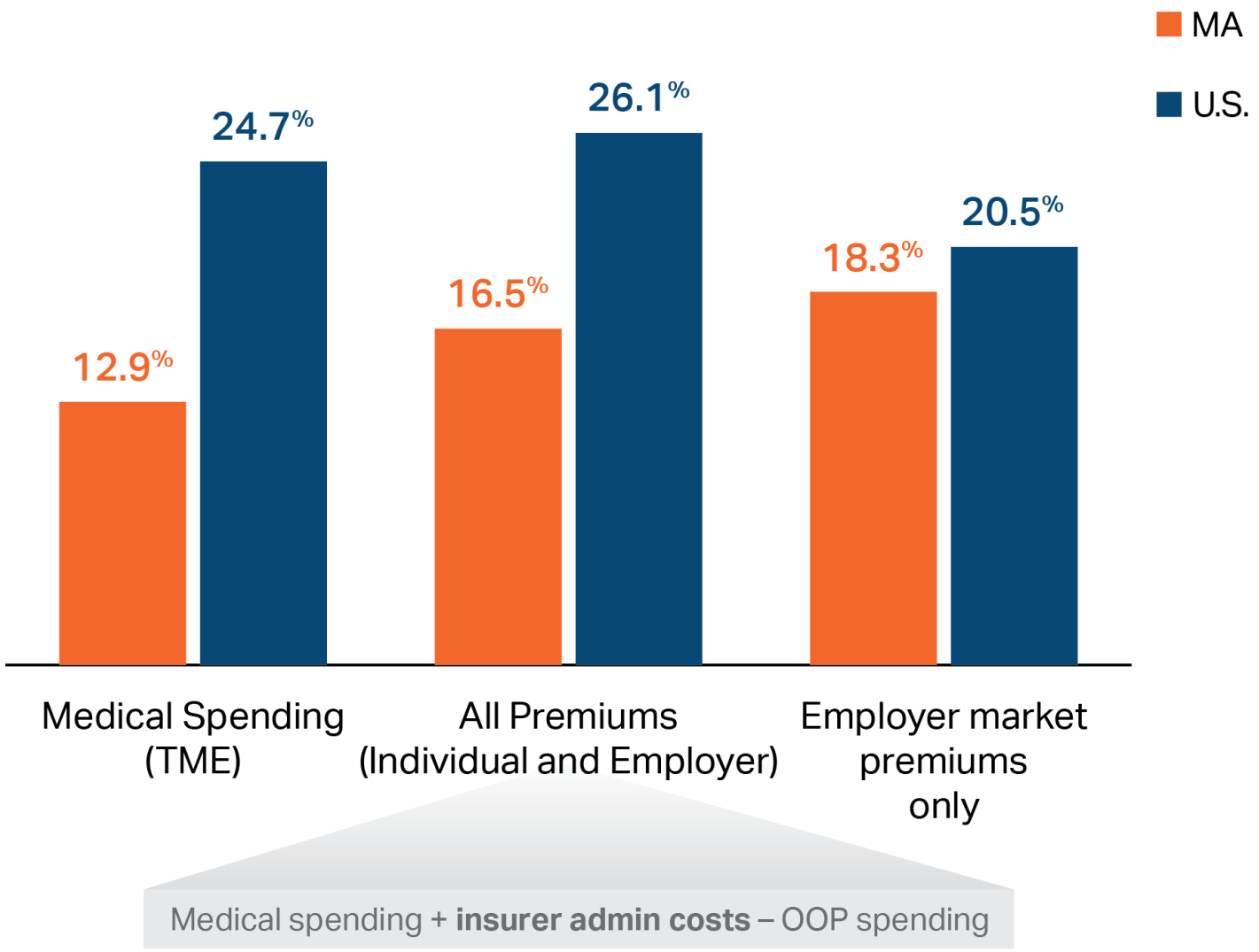
Annual growth in commercial medical spending per enrollee, Massachusetts and the U.S., 2006-2018



Notes: U.S. data includes MA. MA data point for 2018 is preliminary.
Sources: CMS National Healthcare Expenditure Accounts, Personal Health Care Expenditures Data (U.S. 2014-2018) ; CMS State Healthcare Expenditure Accounts (U.S. 2000-2014 and MA 2000-2014); CHIA Annual Report THCE Databooks (MA 2014-2018).

From 2013 to 2018, commercial spending and premium growth in Massachusetts was below U.S. averages; however, the difference was less pronounced for employer market premiums.

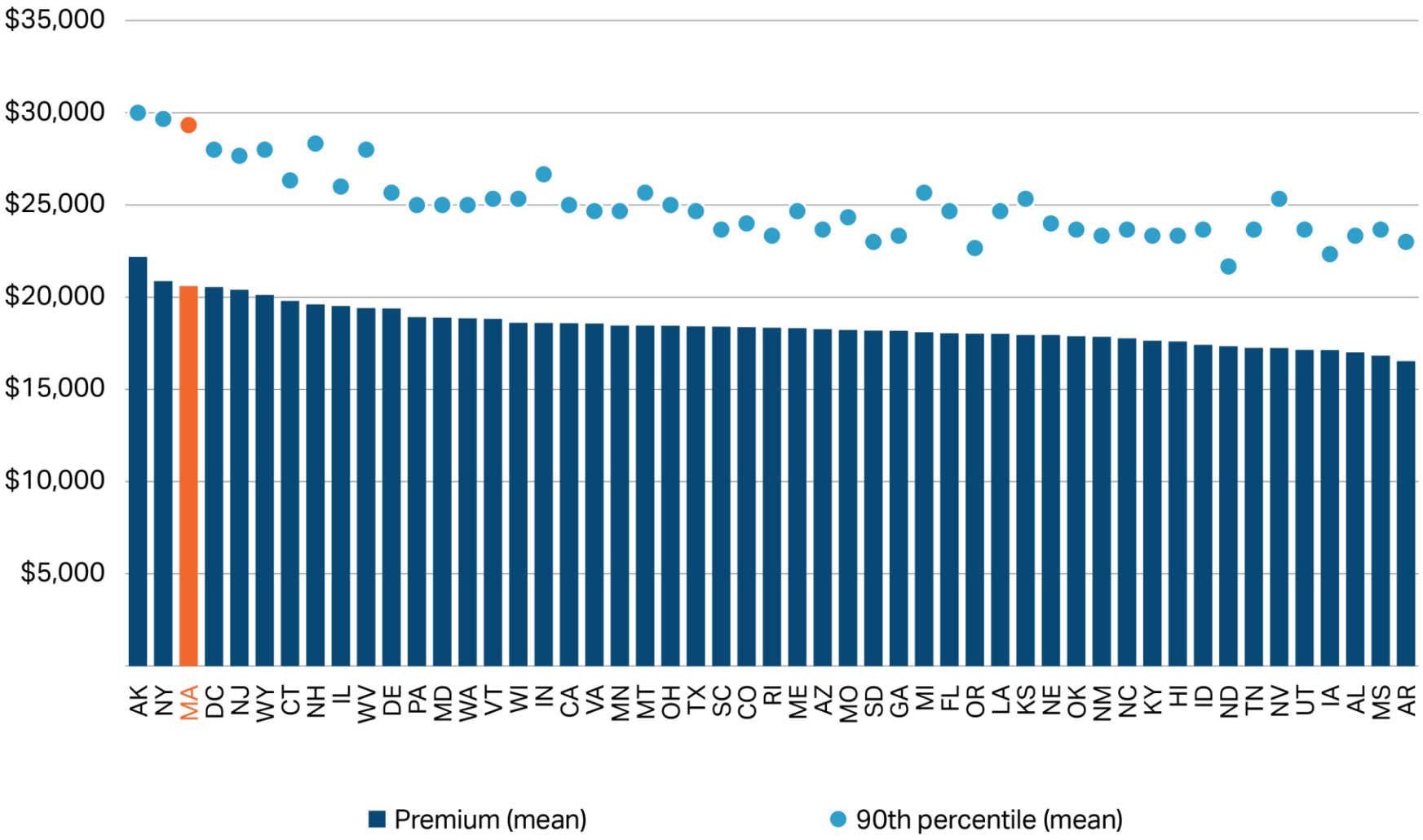
Commercial spending growth per enrollee according to several metrics, 2013-2018



Sources: Massachusetts Center for Health Information and Analysis, Agency for Healthcare Quality and Research, Medical Expenditure Panel Survey, Insurance Component

Massachusetts has the 3rd highest average family premium in the U.S.; premiums exceed $30,000 for one in 10 Massachusetts residents.

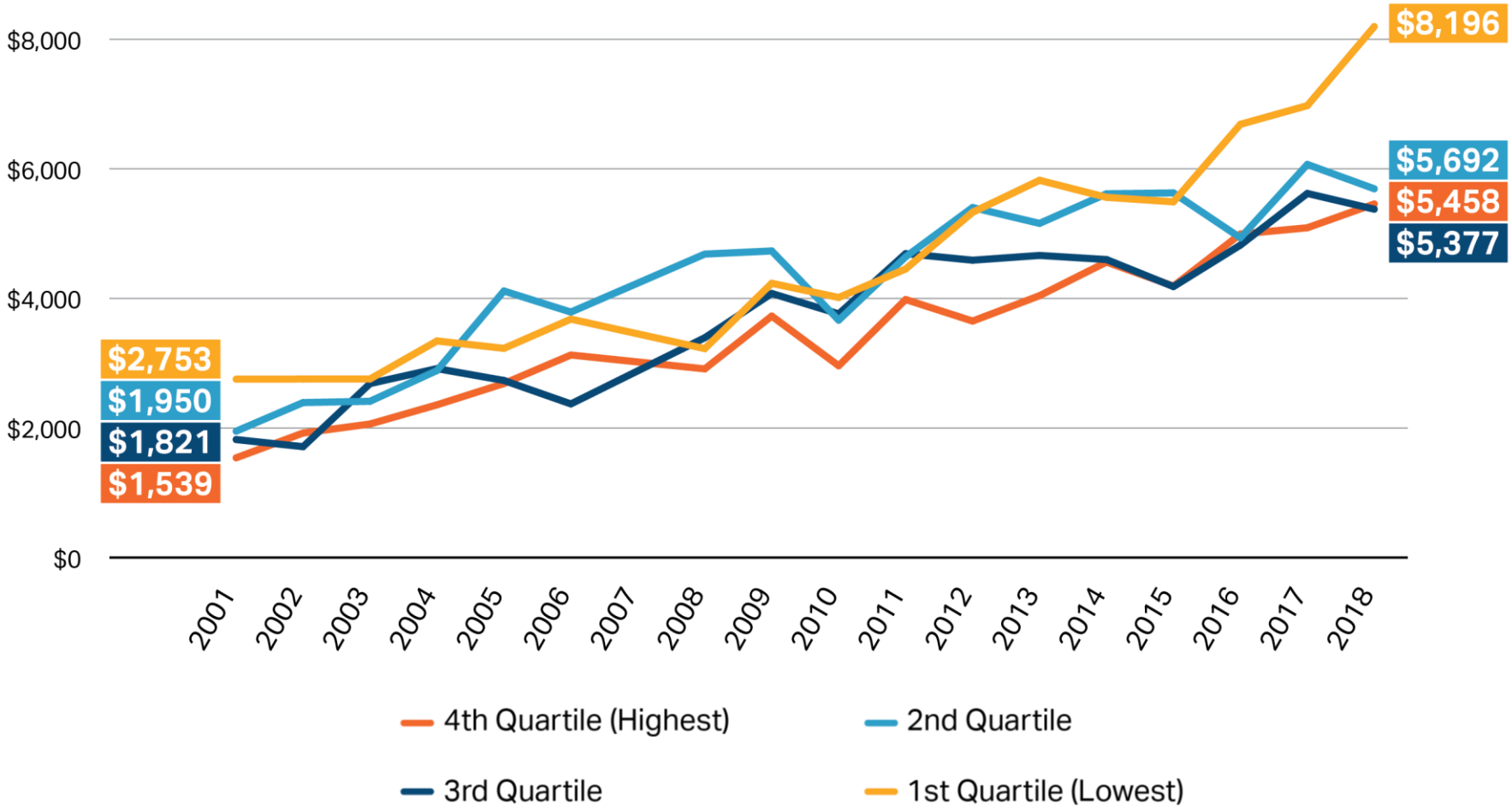
Average and 90th percentile of family premiums by state averaged across 2016-2018



Notes: Mean premiums and 90th percentile are three year averages from 2016 to 2018. Premiums include both employer and employee contributions.
Source: HPC analysis of Agency for Healthcare Research and Quality (AHRQ) Medical Expenditure Panel Survey (MEPS), 2016-2018

The employee premium contribution for low-wage employees is significantly greater than higher-wage employees and is growing faster.

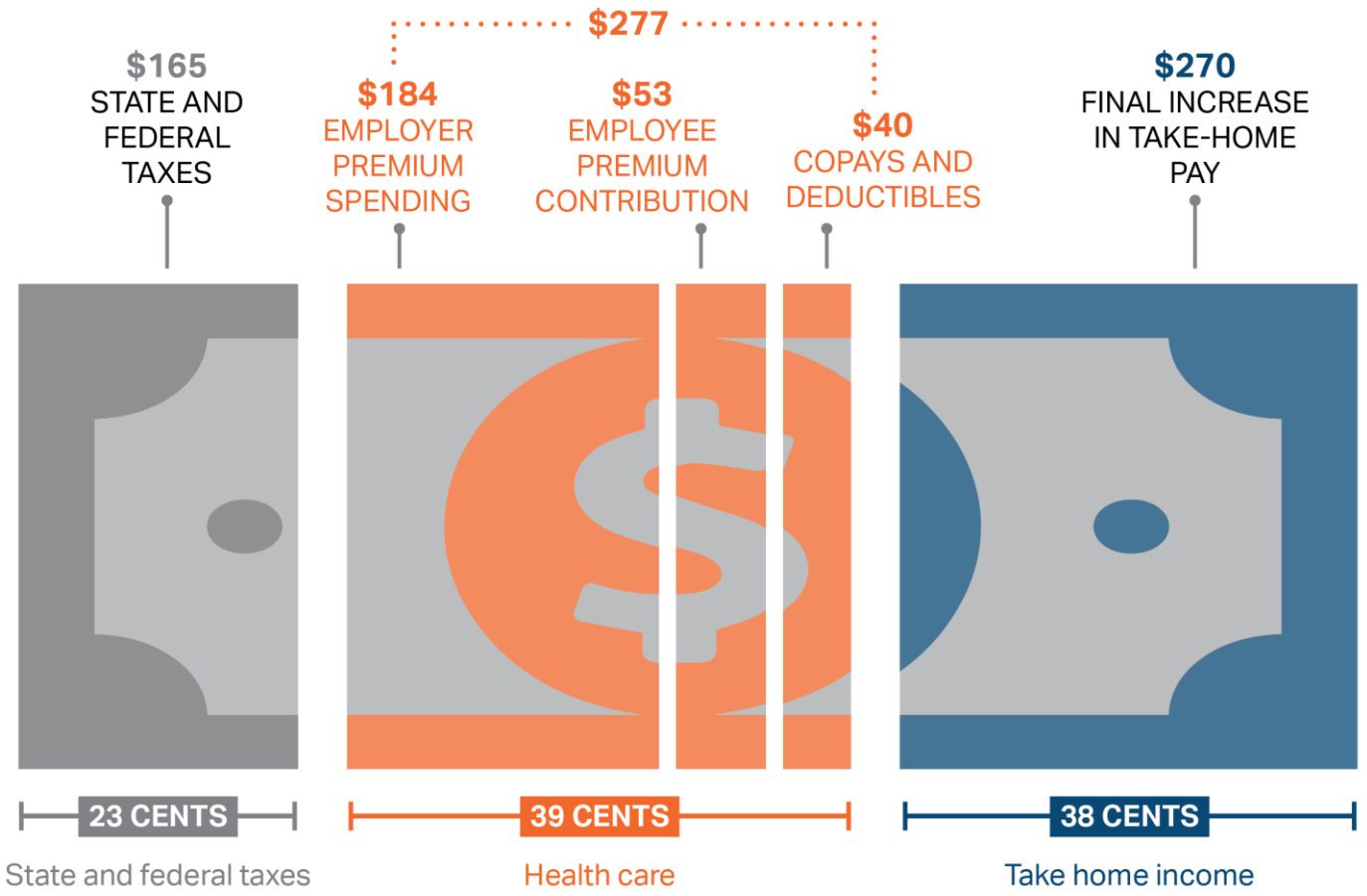
Required employee contribution for family coverage premium by firm wage quartile, 2001-2018



Notes: Mean premiums and 90th percentile are three-year averages from 2016 to 2018. Premiums include both employer and employee contributions.
Source: HPC analysis of Agency for Healthcare Research and Quality (AHRQ) Medical Expenditure Panel Survey (MEPS), 2016-2018

Nearly 40 cents of every additional dollar earned by Massachusetts families between 2016 and 2018 went to health care.

Allocation of the increase in monthly compensation between 2016 and 2018 for a median Massachusetts with health insurance through an employer



Notes: Data represent Massachusetts families who obtain private health insurance through an employer. Massachusetts median family income grew from $95,207 to $101,548 over the period while mean family employer-sponsored insurance premiums grew from $18,955 to $21,801. Compensation is defined as employer premium contributions plus income as recorded in the ACS and is considered earnings. All premium payments are assumed non-taxable. Tax figures include income, payroll, and state income tax.

Sources: HPC analysis of Agency for Healthcare Research and Quality (AHRQ) Medical Expenditure Panel Survey Insurance Component (premiums) American Community Survey (ACS) 1-year files (income), and Center for Health Information and Analysis 2019 Annual Report (cost-sharing).

HPC

Select Findings from the 2019 Cost Trends Report

Topics

Overview

Provider Organization Performance Variation

- **Utilization measures**
- **Low value care**

Hospital Spending and Utilization

HPC

2019 Cost Trends Report: Chartpacks

Provider Organization Performance Variation

Hospital Utilization

Post-Acute Care

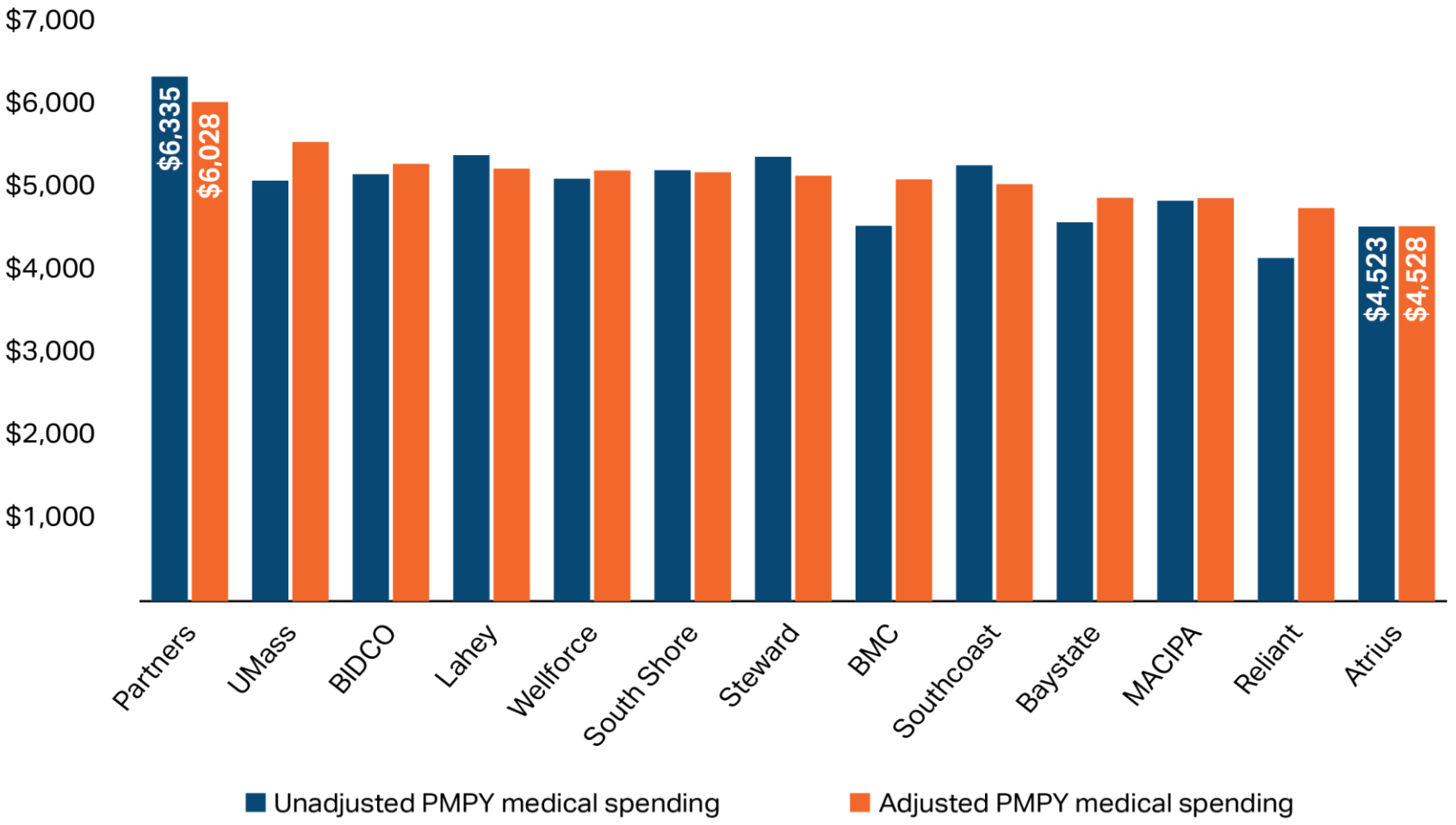
Alternative Payment Methods

Background: Provider Organization Performance Variation

- The HPC has explored provider performance variation among **commercially-insured** patients with PCPs in one of the 13 largest provider organizations
- This analysis includes roughly **900,000 Massachusetts residents** in 2017
- Measures exclude non-claims spending, and are adjusted for member:
  - ✓ Age
  - ✓ Sex
  - ✓ Health status (risk score)
  - ✓ Insurer and product type (i.e., HMO, PPO)
  - ✓ Sociodemographic variables in member's community (i.e., income, employment status, housing status, family structure)

Annual risk-adjusted medical spending was $1,500 (33%) higher for patients attributed to Partners PCPs than for patients with Atrius PCPs.

Annual medical spending per attributed member by provider organization, 2017

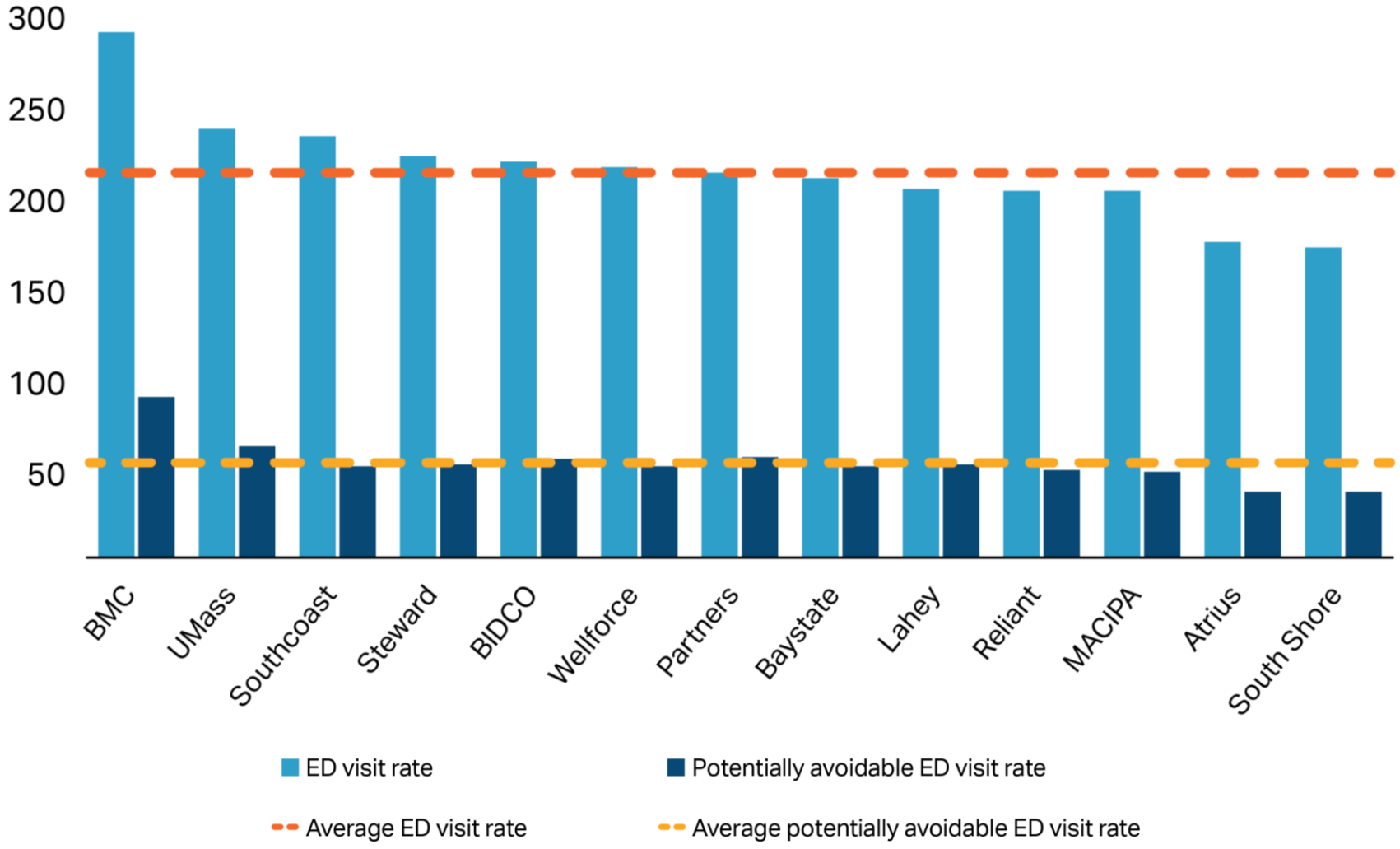


Notes: PMPY = per member per year. Prescription drug spending and non-claims-based spending excluded. Spending results are for commercial attributed adults (N=865,340). Adjusted results are adjusted for differences in age, sex, health status, and community-level variables related to education and socioeconomic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

Sources: HPC analysis of Massachusetts All-Payer Claims Database, 2017.

Potentially avoidable ED visits varied two-fold by provider group.

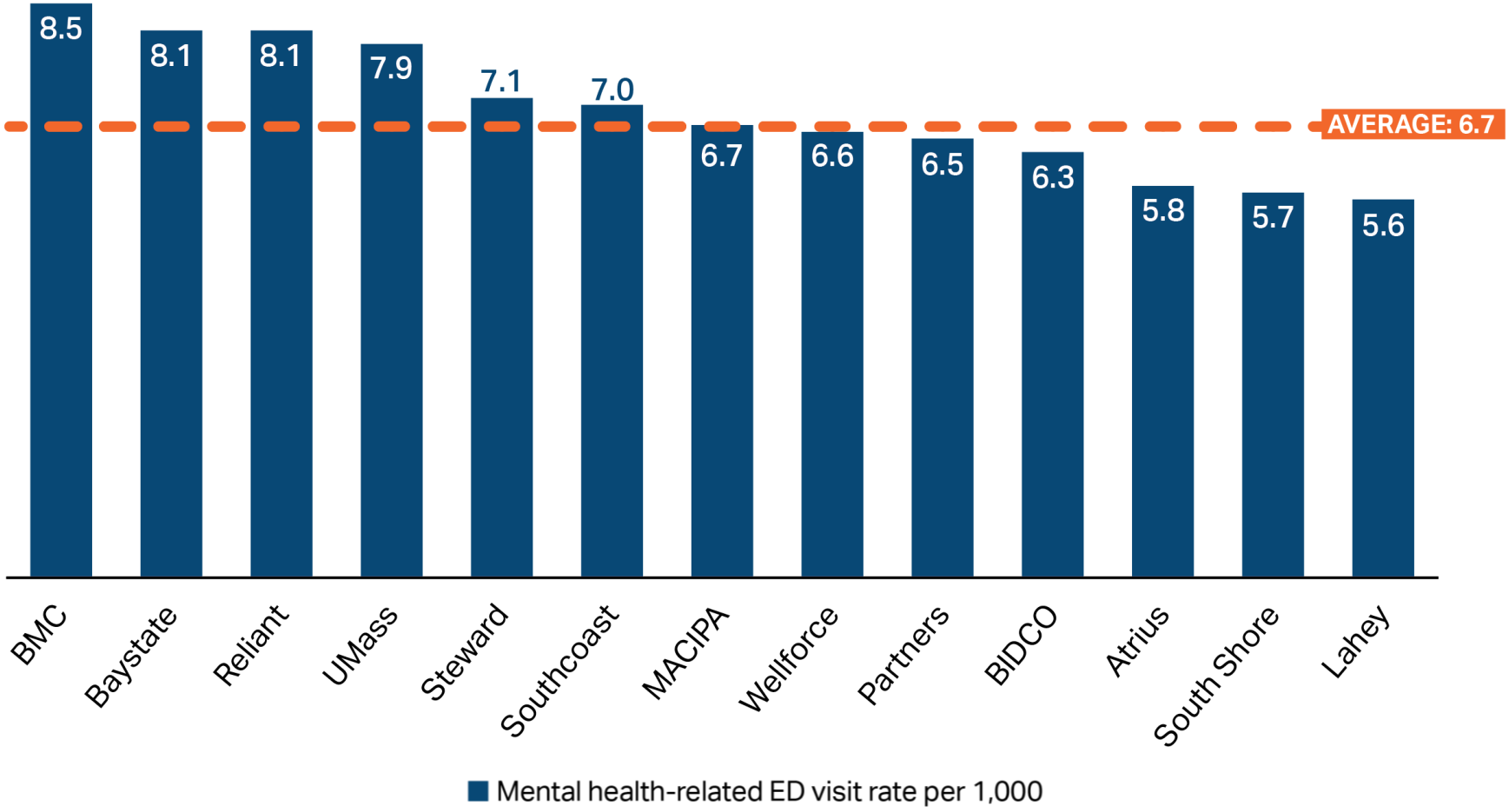
Adjusted visits per 1,000 attributed commercial patients, 2017



Notes: Potentially avoidable ED visits are based on the Billings algorithm. Results reflect commercial attributed adults, at least 18 years of age (N=865,340). Sources: HPC analysis of Massachusetts All-Payer Claims Database, 2017

Mental-health-related ED visits varied 50% across provider groups.

Adjusted visits per 1,000 attributed commercial patients, 2017



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

Sources: HPC analysis of Massachusetts All-Payer Claims Database, 2017

The HPC analyzed 7 low value services among 900,000 attributed patients in 2017.

Low value services studied
Screening
T3 (Thyroid) tests
Cardiac stress tests
Vitamin D screening
Pre-operative testing
Baseline labs for low-risk surgery
Chest radiograph for non-cardiothoracic low risk surgery
Procedures
Spinal injections for lower back pain
Stent for patients with an established diagnosis of ischemic heart disease

$13 million

Total spending on evaluated low value services

101,516

Total # of patients with at least 1 LVC service

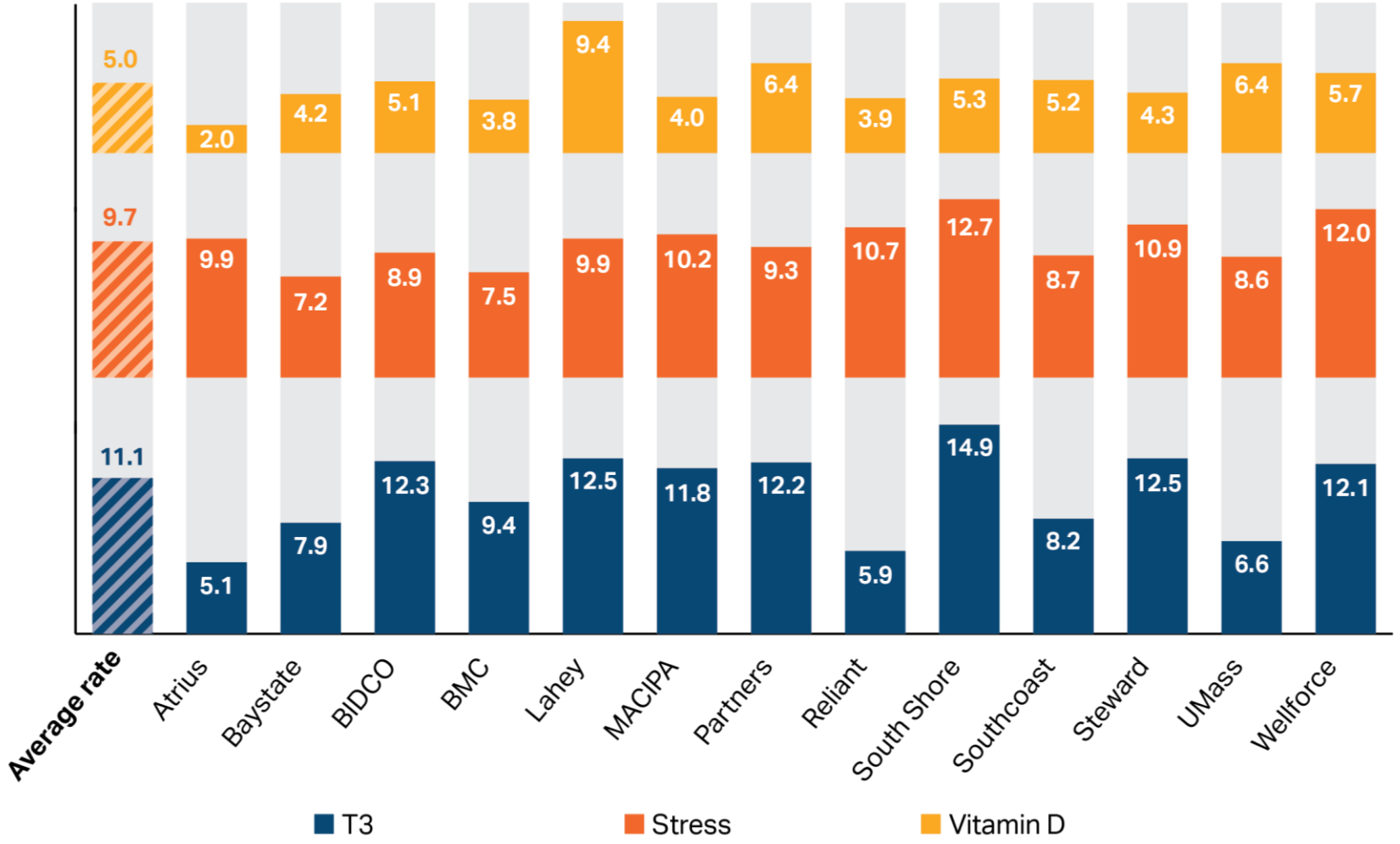
163,532

Total # of LVC services identified

HPC

The rate of low value screenings varies by provider groups, with an overall large number of patients receiving unnecessary care.

Low value screenings per 100 eligible commercial patients, 2017

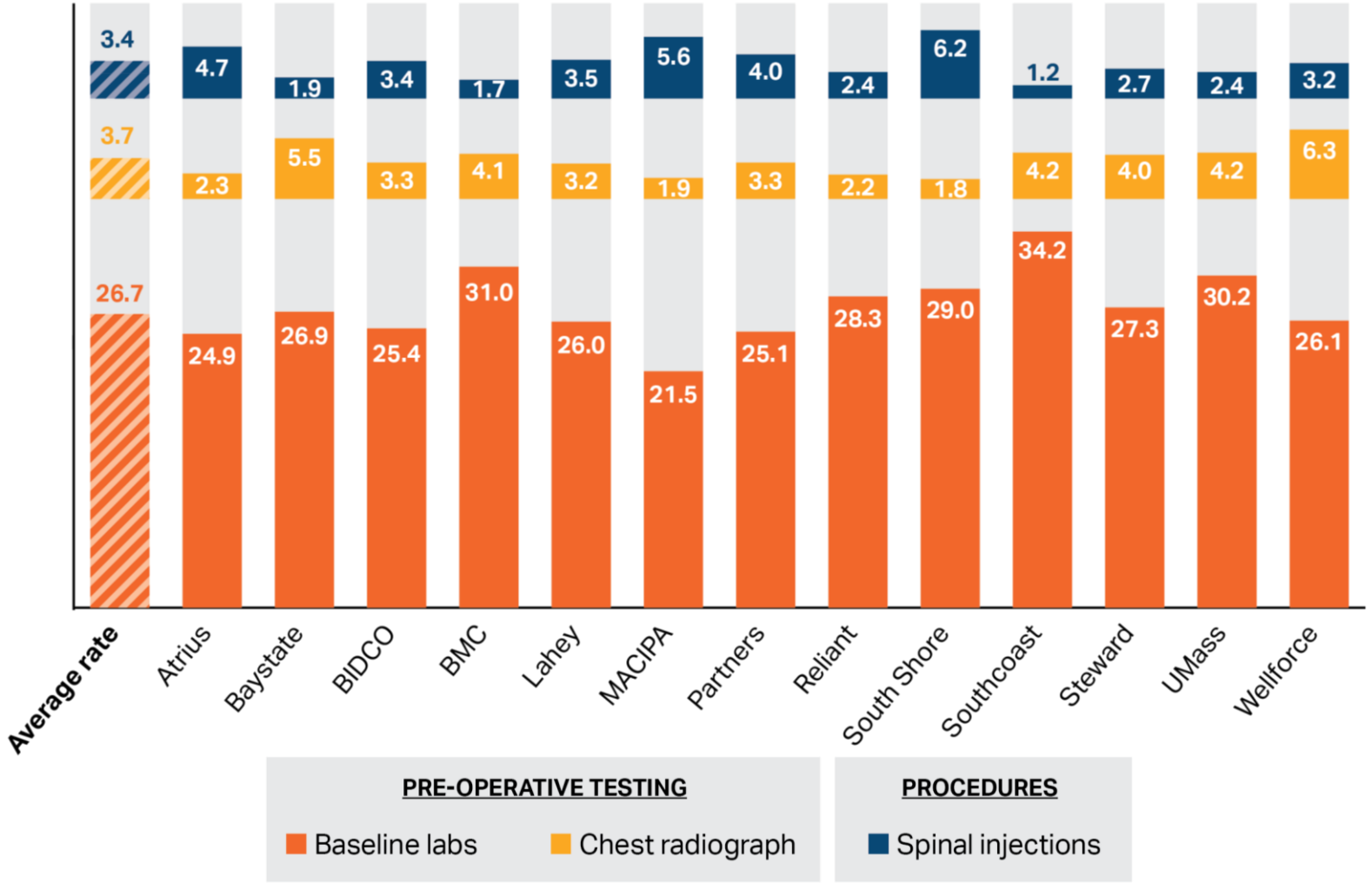


Notes: T3 = Total or free T3 level measurement in a patient with a hypothyroidism diagnosis during the year; Stress = Stress testing for patients with an established diagnosis of ischemic heart disease or angina at least 6 month before the stress test, and thus not done for screening purposes; Vitamin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

Source: HPC analysis of Massachusetts All-Payer Claims Database, 2017

On average, more than one in four patients received unnecessary pre-operative tests.

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

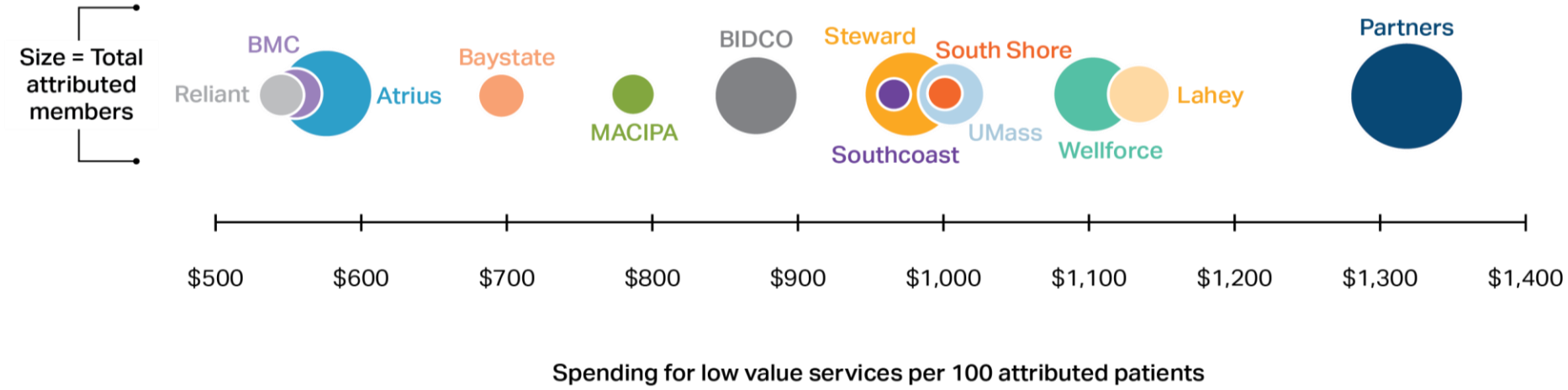


Notes: Baseline labs = Baseline labs in patients without significant systemic disease undergoing low-risk surgery; Chest radiograph = Chest radiographs occurring less than 30 days before a low or intermediate risk non-cardiothoracic surgical procedure (not associated with inpatient or emergency care). Based on a patient's medical history and inclusion criteria for each low value measure, a member 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. See technical appendix for details.

Source: HPC analysis of Massachusetts All-Payer Claims Database, 2017

Total per-member spending on 7 low value care measures varied more than two-fold across provider groups.

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



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

Source: HPC analysis of Massachusetts All-Payer Claims Database, 2017

Select Findings from the 2019 Cost Trends Report

Topics

Overview	Provider Organization Performance Variation	Hospital Spending and Utilization

- Trends in inpatient severity of illness
- Trends in inpatient commercial volume
- Outpatient spending growth

HPC

Select Findings from the 2019 Cost Trends Report

Topics

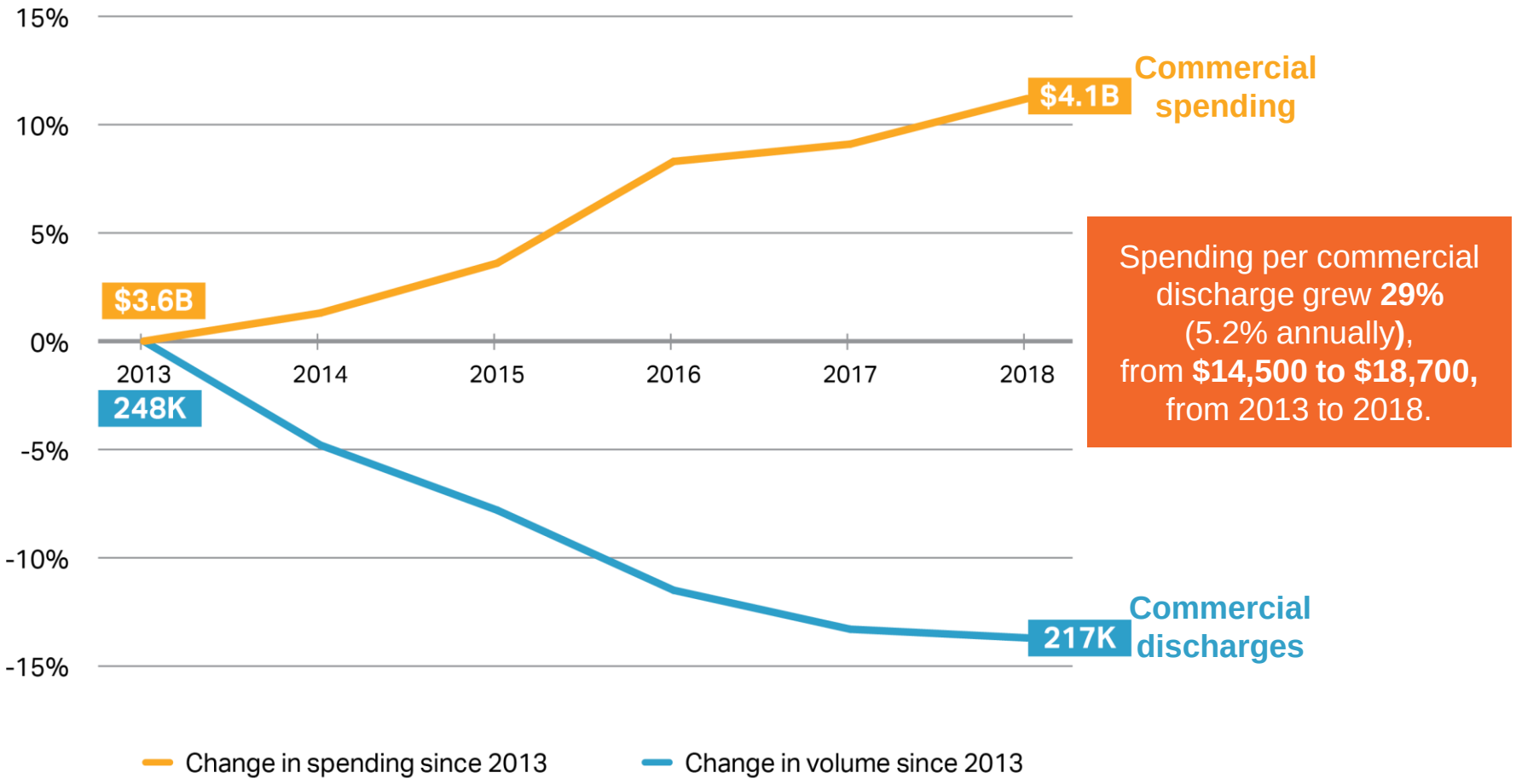
Overview	Provider Organization Performance Variation	Hospital Spending and Utilization

- **Trends in inpatient severity of illness**
- **Trends in inpatient commercial volume**
- Outpatient spending growth

HPC

Commercial inpatient spending grew 11% even as volume fell 14% between 2013 and 2018.

Cumulative change in commercial inpatient hospital volume and spending per-enrollee (percentages) and absolute, 2013-2018



Spending per commercial discharge grew **29%** (5.2% annually**)**, from **$14,500 to $18,700,** from 2013 to 2018.

Notes: Data points indicate % growth from previous year (2013=0). Volume data correspond to fiscal years while spending data are calendar years.

Sources: CHIA Hospital Inpatient Discharge Data, 2013-2018. Commercial full-claims TME from CHIA Annual Report TME Databooks. 2019 Annual report (for 2017-8 growth and 2016-7 growth), 2018 Annual Report (for 2015-6), 2017 annual report (for 2014-2015) and 2016 Annual Report (for 2013-4 growth).

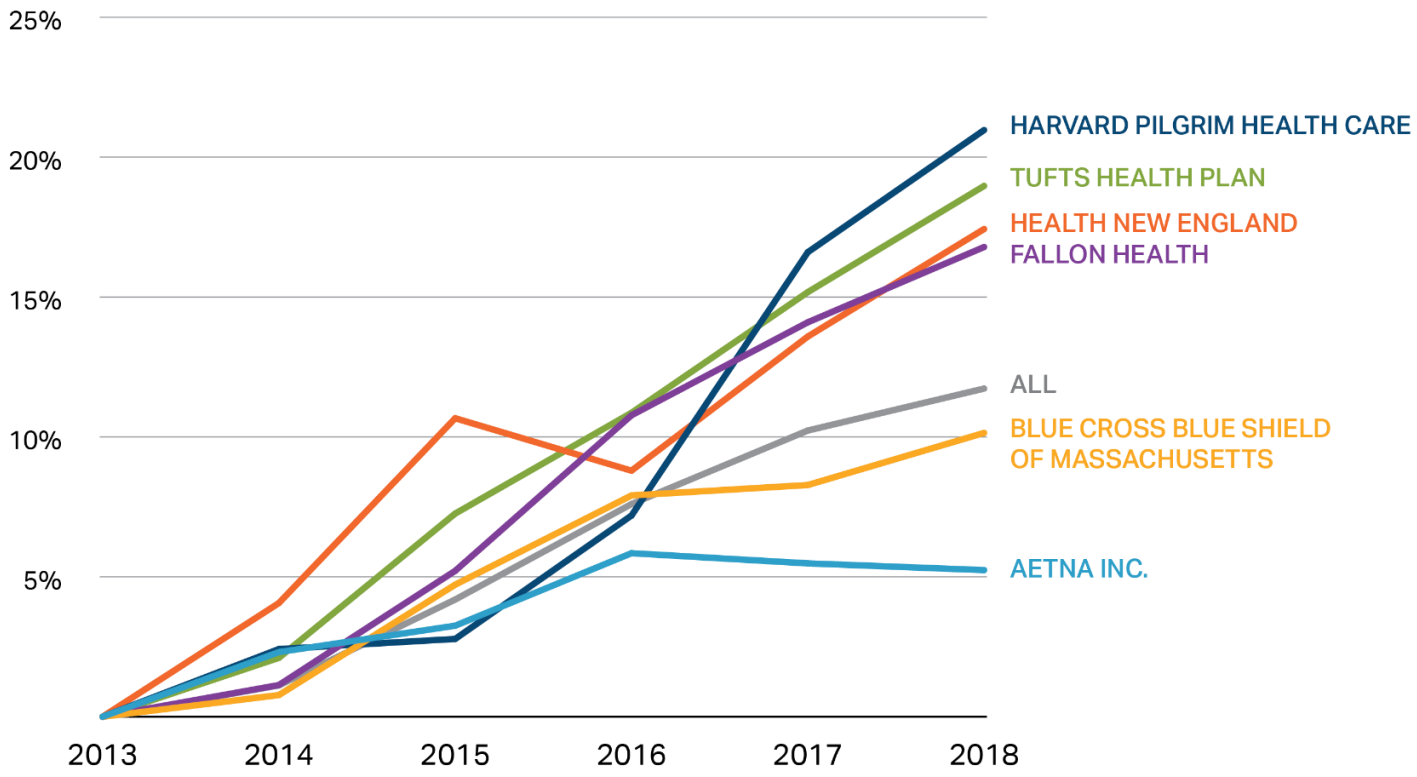
Why have commercial insurer payments per inpatient stay grown 5.2% per year?

- **Prices** for a given stay increased **2-3%** per year
- **Severity** or **acuity** of stays increased **2-3%** per year
  - Payments per stay are proportional to acuity

What is causing the acuity increase?

Statewide commercial member risk scores rose 11.7% from 2013-2018.

Change in average risk score for all members, by payer, 2013-2018



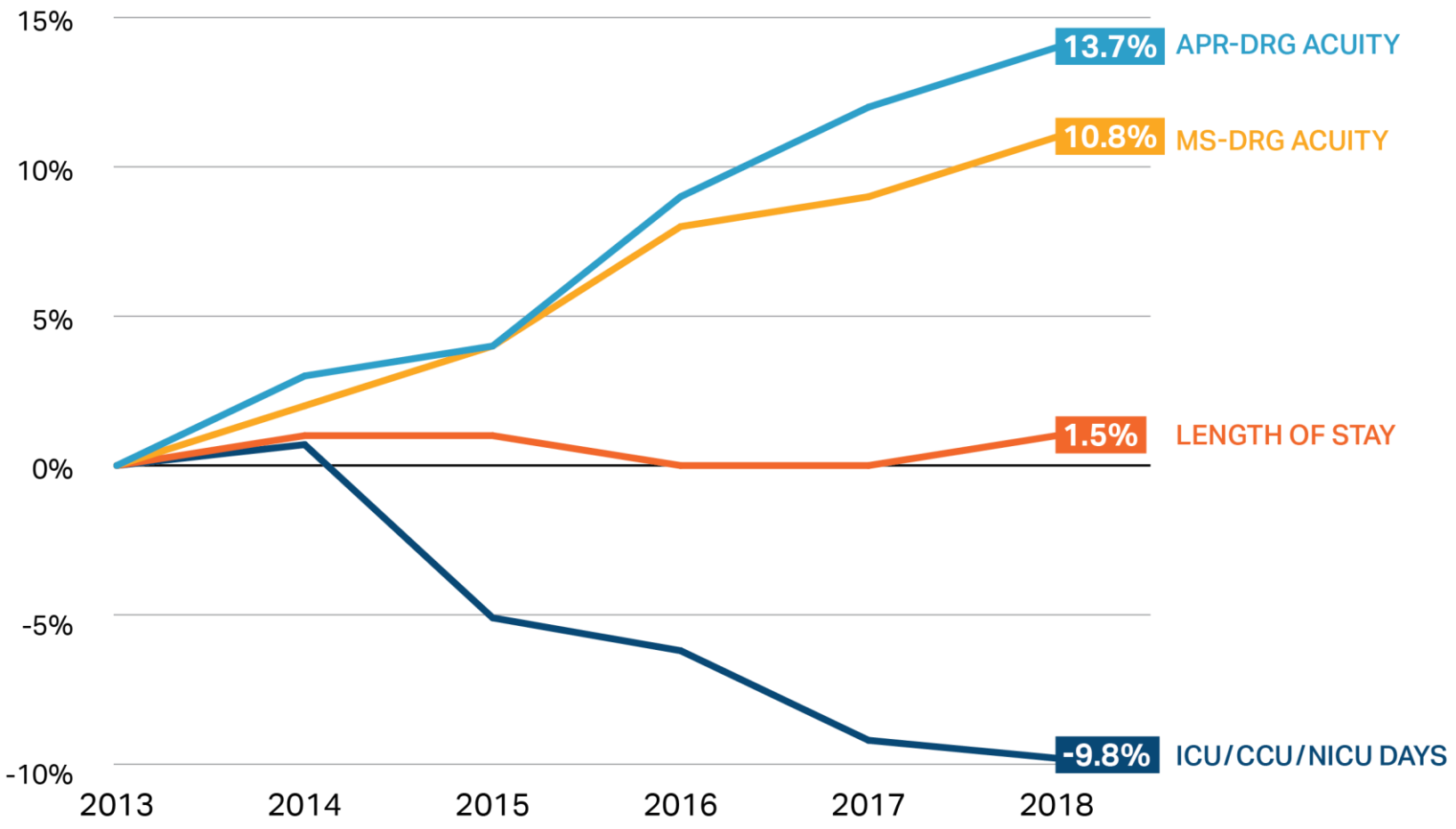
- The aging of the population explains **0.5%** of the **11.7%** increase
- **No increase** in underlying burden of chronic disease

This amount of increased risk is equivalent to **430,000** more privately-insured Massachusetts residents with complex diabetes or **920,000** more residents with cerebral palsy.

Notes: Risk scores normalized to 1.0 in 2013. United, Cigna, BMC Healthnet, Minuteman, NHP and Celticare excluded due to data anomalies or fluctuating membership.
Sources: CHIA TME databooks, 2016 and 2018. Federal Register vol 78 no. 47 March 11, 2013, Adult Risk Adjustment Model Factors. Burden of chronic disease analyzed using the CDC's BRFSS survey; rates of arthritis and diabetes among Massachusetts residents increased while COPD and asthma decreased from 2013 to 2016. Life expectancy was unchanged. Impact of population aging assessed using insurer demographic data combined with age/sex/spending profiles from the APCD.

Overall, inpatient acuity grew more than 10% between 2013 and 2018 while other indicators of clinical severity did not increase.

Percent increase in acuity, length of stay and intensive care days, 2013-2018

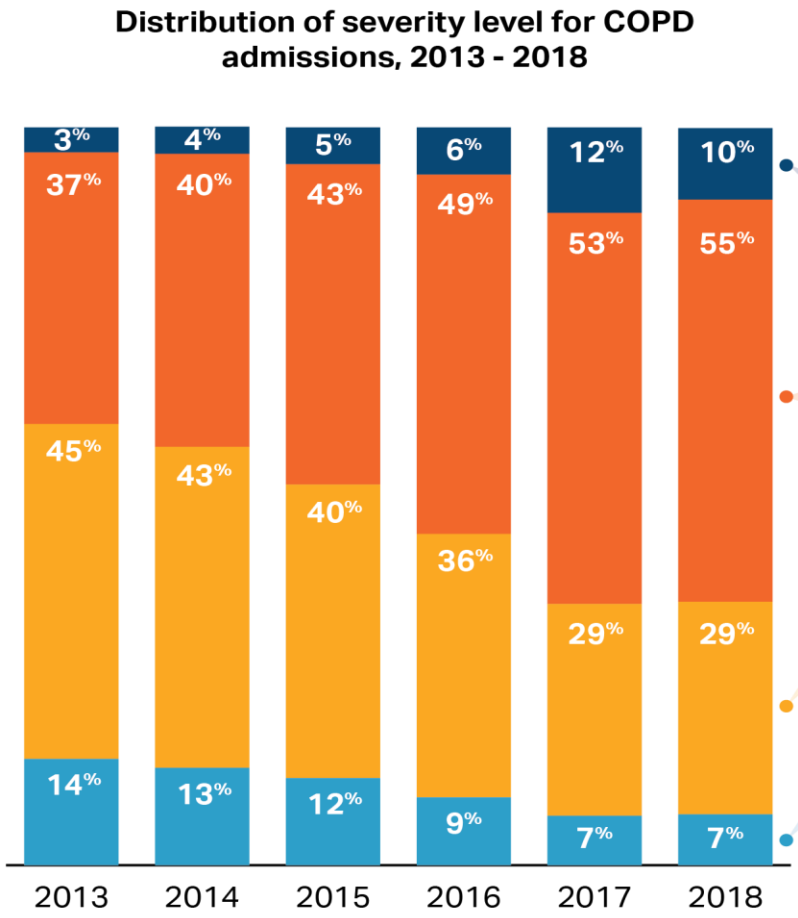


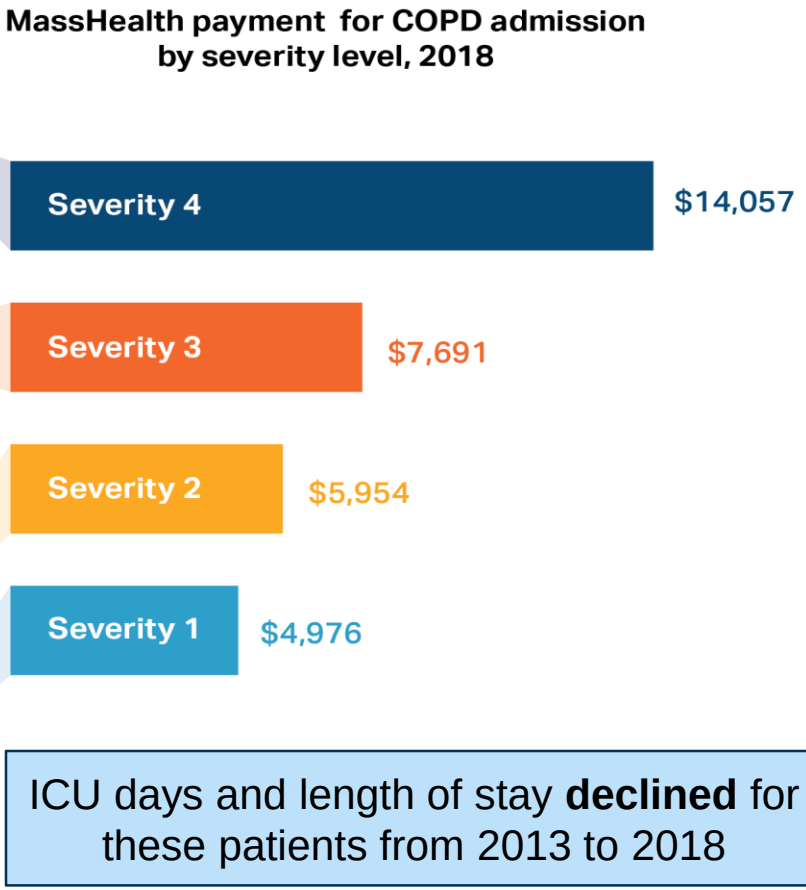
Notes: LOS: length of stay; ICU/CCU/NICU: intensive care unit/cardiac care unit/neonatal intensive care unit days; APR-DRG: acuity measured using publically available MassHealth DRG weights, MS-DRG: weights used for MS-DRG acuity.

Source: CHIA Hospital Inpatient Discharge Database, 2013-2018; MS-DRG classification system, APR-DRG classification system

As illustrated by COPD patients, the acuity change is driven mostly by more patients coded as high-severity for a given diagnosis.

MassHealth hospital payment for a patient with COPD for each severity level and percent of COPD discharges (all payer) at each severity level





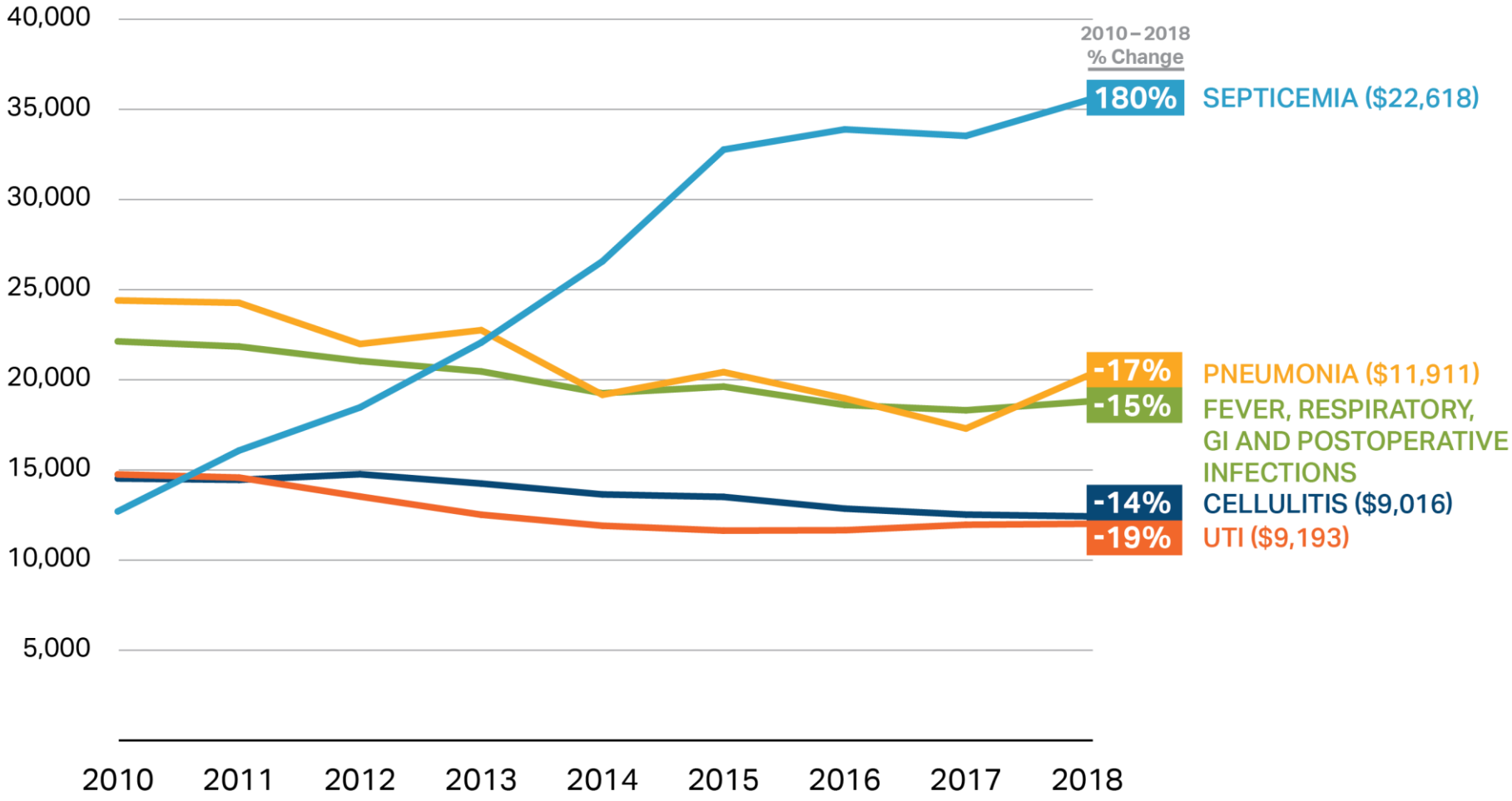
ICU days and length of stay **declined** for these patients from 2013 to 2018

Note: For these patients, average length of stay dropped 3% between 2013 and 2018 as did ICU days. Severity levels reflect APR-DRG system used by MassHealth and most commercial payers in Massachusetts. Payments estimated based on publically available MassHealth weights.

Source: CHIA Hospital Inpatient Discharge Database, 2013-2018; MS-DRG classification system, APR-DRG classification system

Some acuity change is also driven by more patients coded as a having higher-acuity (and higher-paying) diagnoses, such as septicemia.

Number of inpatient discharges with each of the indicated DRGs, 2010-2018



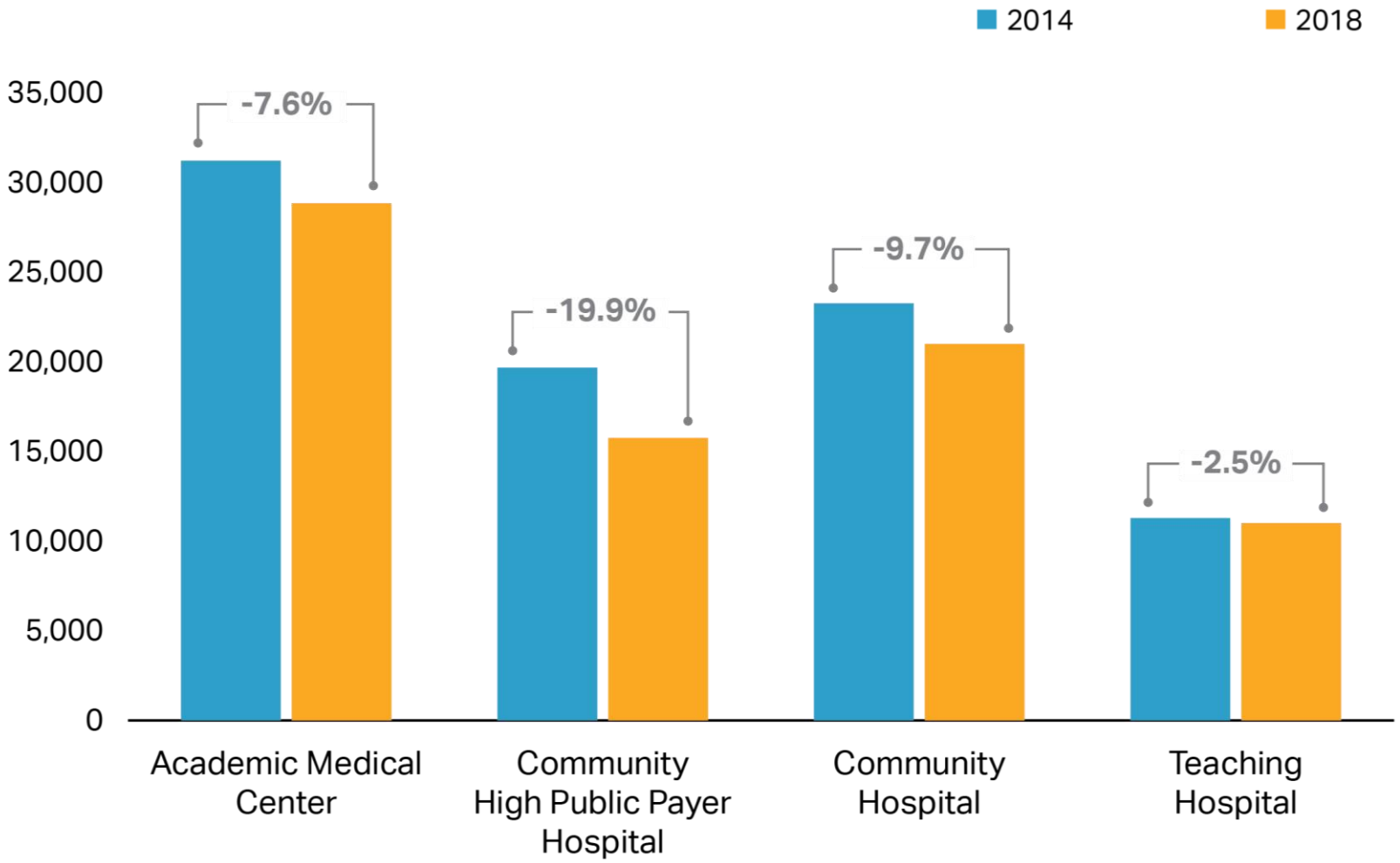
Note: Dollar figures represent average facility price paid in 2016 for commercial adult stays for BCBS, THP or HPHC.
Source: CHIA Hospital Inpatient Discharge Database, 2013-2018; APR-DRG classification system

Decline in Commercial Inpatient Volume

- Commercial inpatient volume **declined** 9.3% from 2014 to 2018.
  - ~ 45% of the decline is due to declining **birth rates**
  - ~ 45% is due to a drop in **scheduled admissions** (versus patients admitted from the ED)
    - *Some scheduled admissions appear to be shifting from inpatient to hospital outpatient settings*

Maternity admissions have declined faster at community hospitals as compared to AMCs and teaching hospitals.

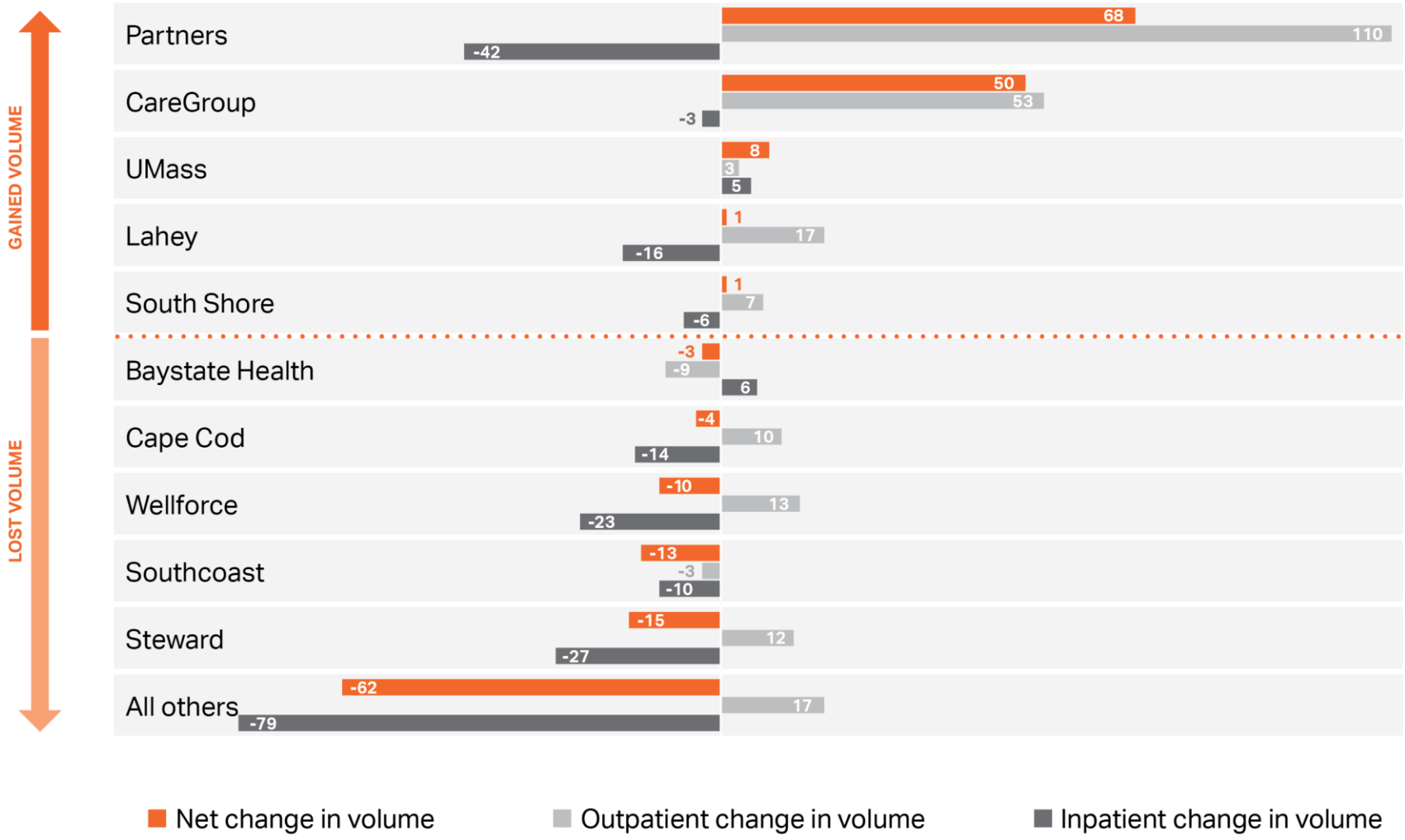
Change in volume of commercial maternity admissions by hospital cohort, 2014-2018



Notes: Maternity was identified as MDC 14 and 15.
Sources: CHIA Hospital Inpatient Discharge Database, 2014-2018

As care shifts from inpatient to outpatient settings, some systems gain volume at the expense of other systems, as shown for hysterectomies.

Change in the number of inpatient and outpatient hysterectomy procedures by hospital system, 2015-2017

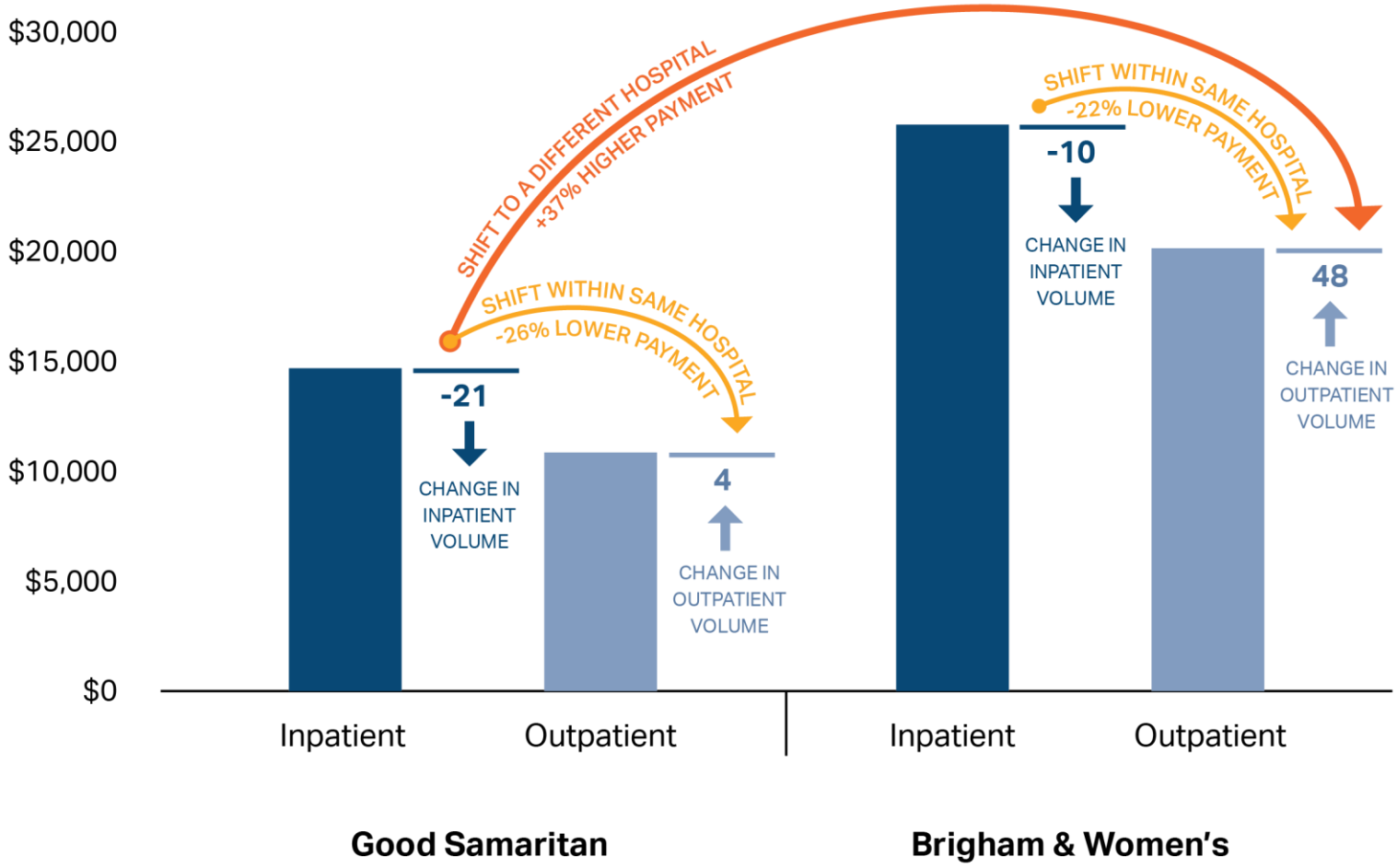


Notes: Case study procedures identified by CCS categories and combined into encounters (same patient, same procedure, same day, same site). These counts may not reflect the true reason for the inpatient stay (e.g., hysterectomy immediately after delivery). All figures reflect rounding.

Sources: HPC analysis of Center for Health Information and Analysis APCD 7.0, 2015 – 2017

Volume shifts from inpatient to outpatient settings across systems may be *cost-increasing*, as shown for hysterectomies, due to variation in hospital payment rates.

Payments per hysterectomy episode at two hospitals and net change in volume, 2015-2017



Notes: The two hospitals shown had the largest net loss in overall hysterectomy volume (Good Samaritan) and the largest net gain (Brigham and Womens hospital). Cases included in the figure exclude complicated hysterectomy, maternity-related hysterectomy, and hysterectomies that involved ovarian cancer

Sources: HPC analysis of CHIA APCD 7.0, 2015-2017. Out of state and non-acute hospitals excluded.

HPC

Select Findings from the 2019 Cost Trends Report

Topics

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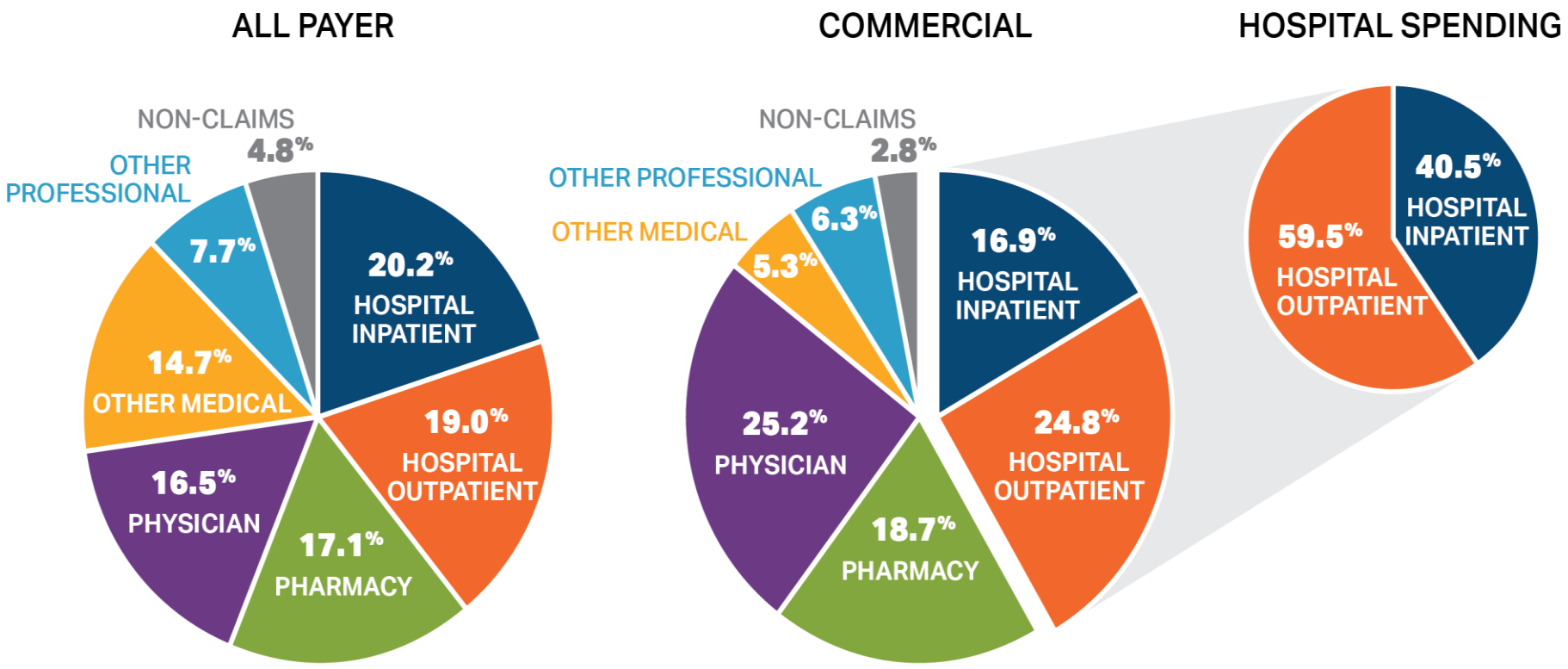
- Trends in inpatient severity of illness
- Trends in inpatient commercial volume
- **Outpatient spending growth**

HPC

Hospital outpatient spending now accounts for 60% of all commercial hospital spending and 25% of total spending.

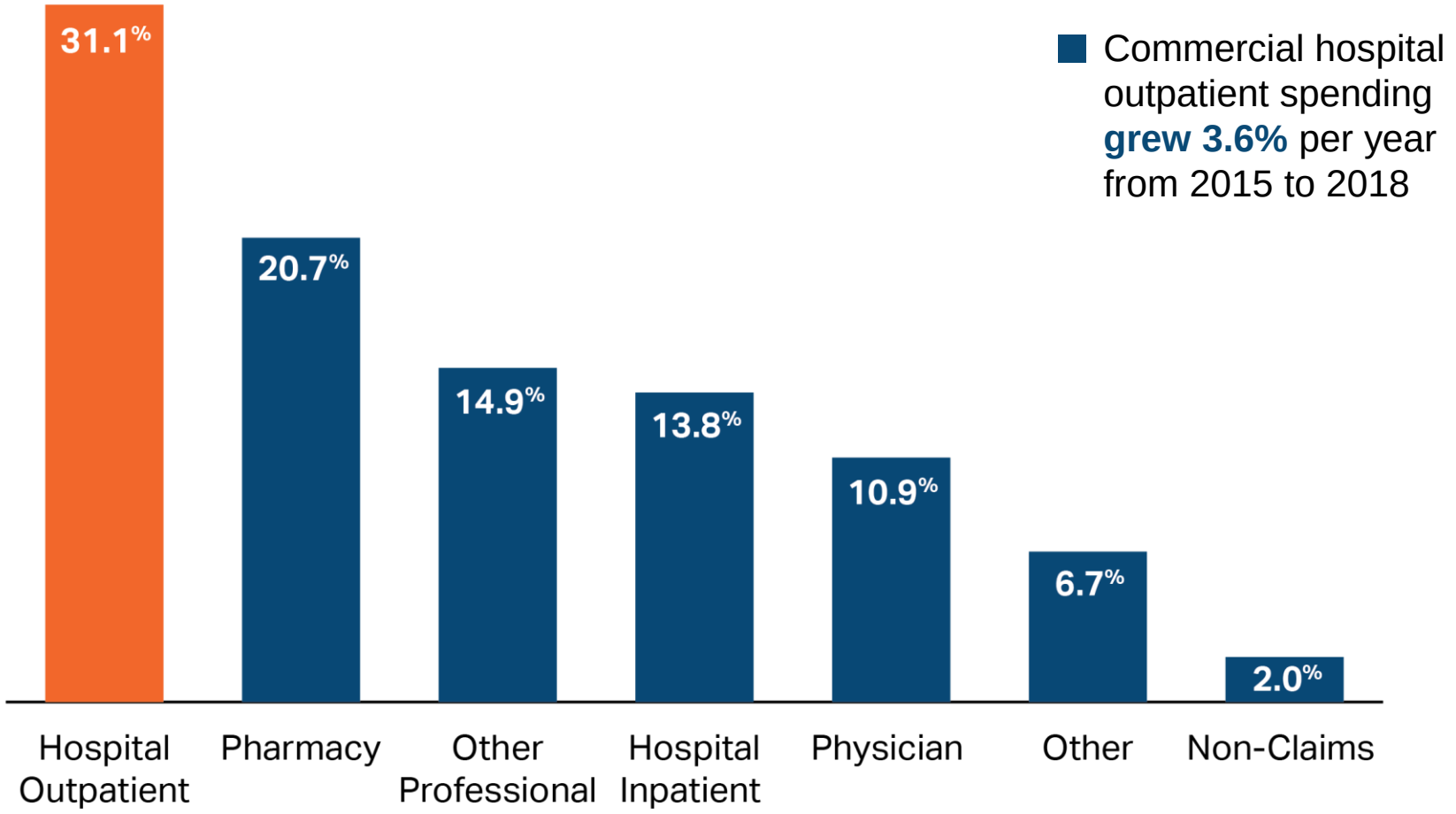
Percent of health care spending by category for commercially insured and all payers, 2018



Notes: Pharmacy spending does not account for rebates.
Sources: CHIA Annual Report, 2019; Spending from CHIA workbook THCE by Service Category and total medical expenditures worksheet, commercial full claims only.

Hospital outpatient spending accounted for the largest share (31%) of commercial TME growth from 2015 to 2018.

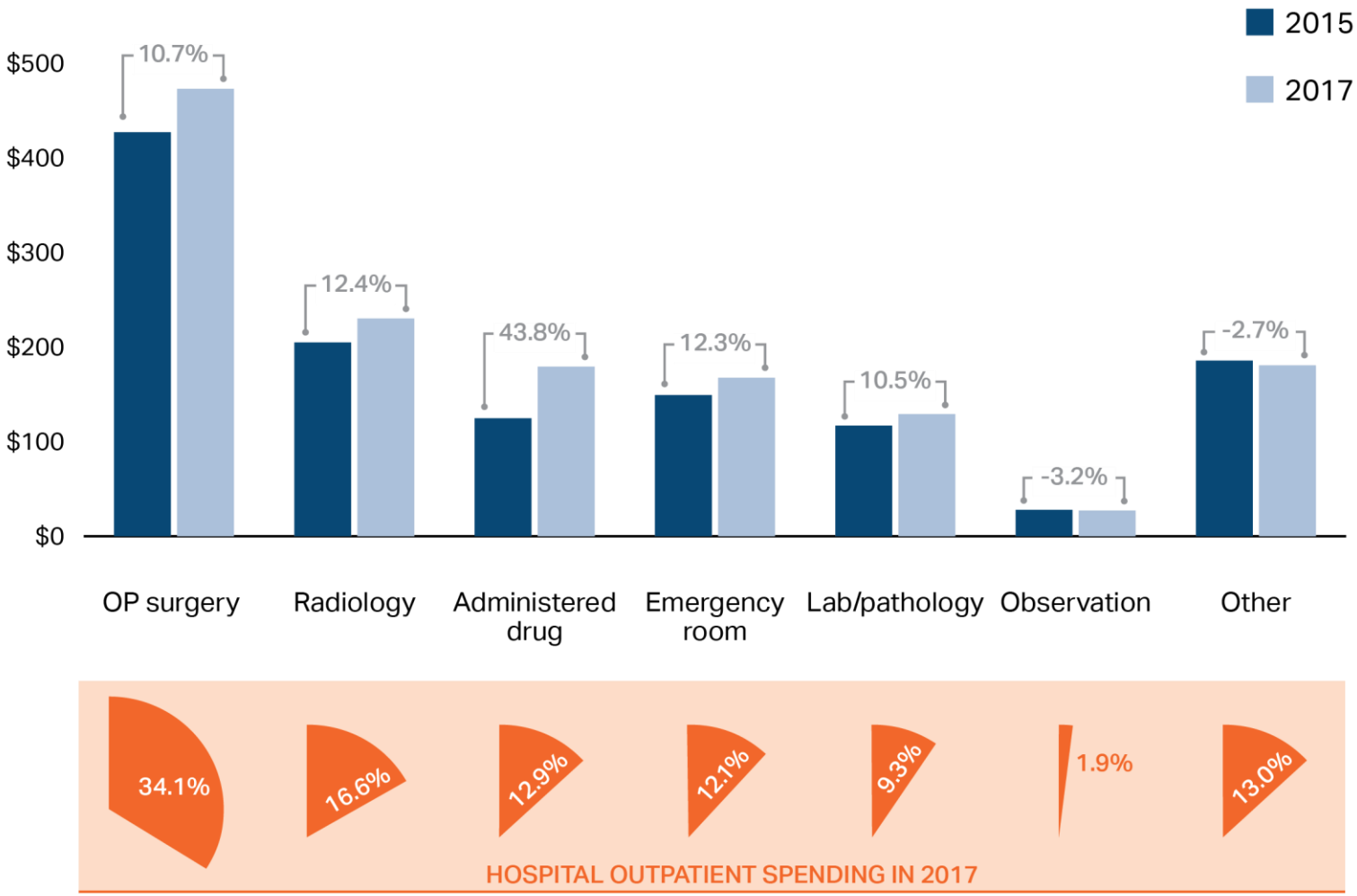
Contribution to commercial full-claim TME spending growth from 2015-2018 (Rx spending is gross)



Notes: Commercial spending estimates only include full-claims. Pharmacy spending does not account for rebates.
Sources: HPC calculations based on CHIA 2019 Annual Report databooks (publicly available & restricted)

Surgeries account for a large share of commercial hospital outpatient spending and growth.

Per member per year outpatient spending by HCCI category, 2015-2017



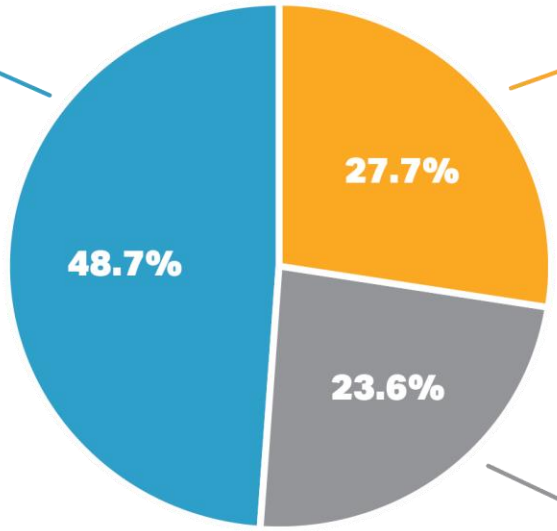
Notes: CHIA's definition of hospital outpatient spending refers to the facility claims reported by hospitals. HCCI categorizes claims by hospital department where a given service belongs which may not be the primary reason for the visit (eg, imaging that happens as part of ED visit).

Source: HPC analysis of CHIA APCD 7.0, 2015-2017. Out of state and non-acute hospitals excluded.

Three sub-categories of outpatient surgery: Major, minor, other.

Distribution of hospital outpatient surgery spending by type of surgical encounter, 2017

MAJOR SURGERY
Invasive therapeutic surgeries, e.g. hysterectomy or arthroscopy



MINOR SURGICAL PROCEDURES
Includes diagnostics like breast biopsy or colonoscopy or endoscopy with excision/biopsy

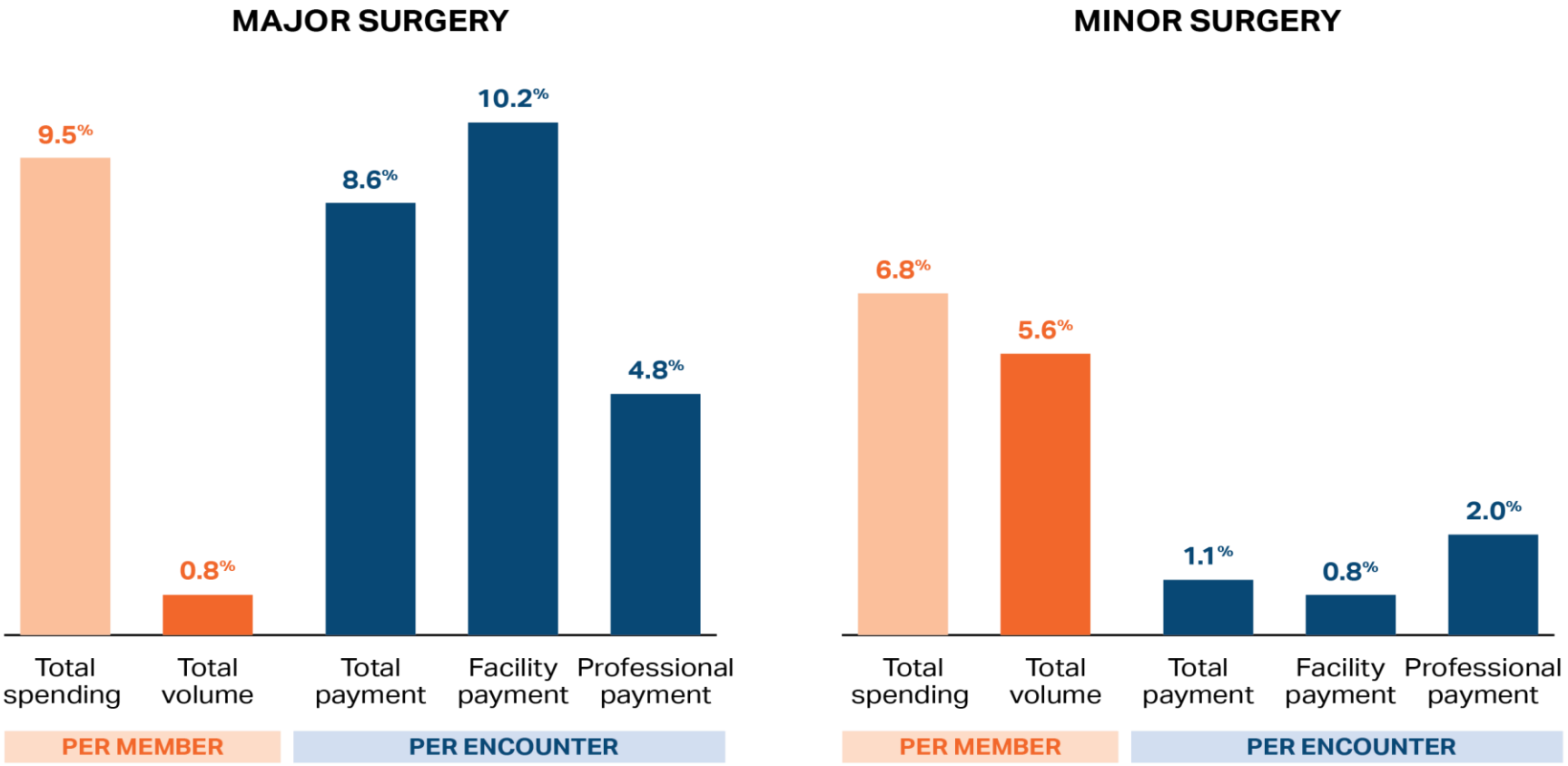
EXCLUDED FROM CURRENT STUDY ("OTHER")
Procedures not classified as surgery, such as ear wax removal or IUD placement

- Of all surgery encounters, hospital spending is 71%; professional spending is 29%
- Professional fees mostly include surgical and anesthesiology services

Notes: HCCI software captures some hospital outpatient as surgical that is not categorized by the AHRQ surgery grouper as being a 'surgery'. These are excluded from current study.
Source: HPC analysis of CHIA APCD 7.0, 2015-2017. Out of state and non-acute hospitals excluded.

Spending grew for both major (9.5%) and minor (6.8%) outpatient surgeries from 2015 to 2017, but drivers of spending growth differed.

Percent growth by commercial spending, volume, and average price for major and minor OP surgery, 2015-2017

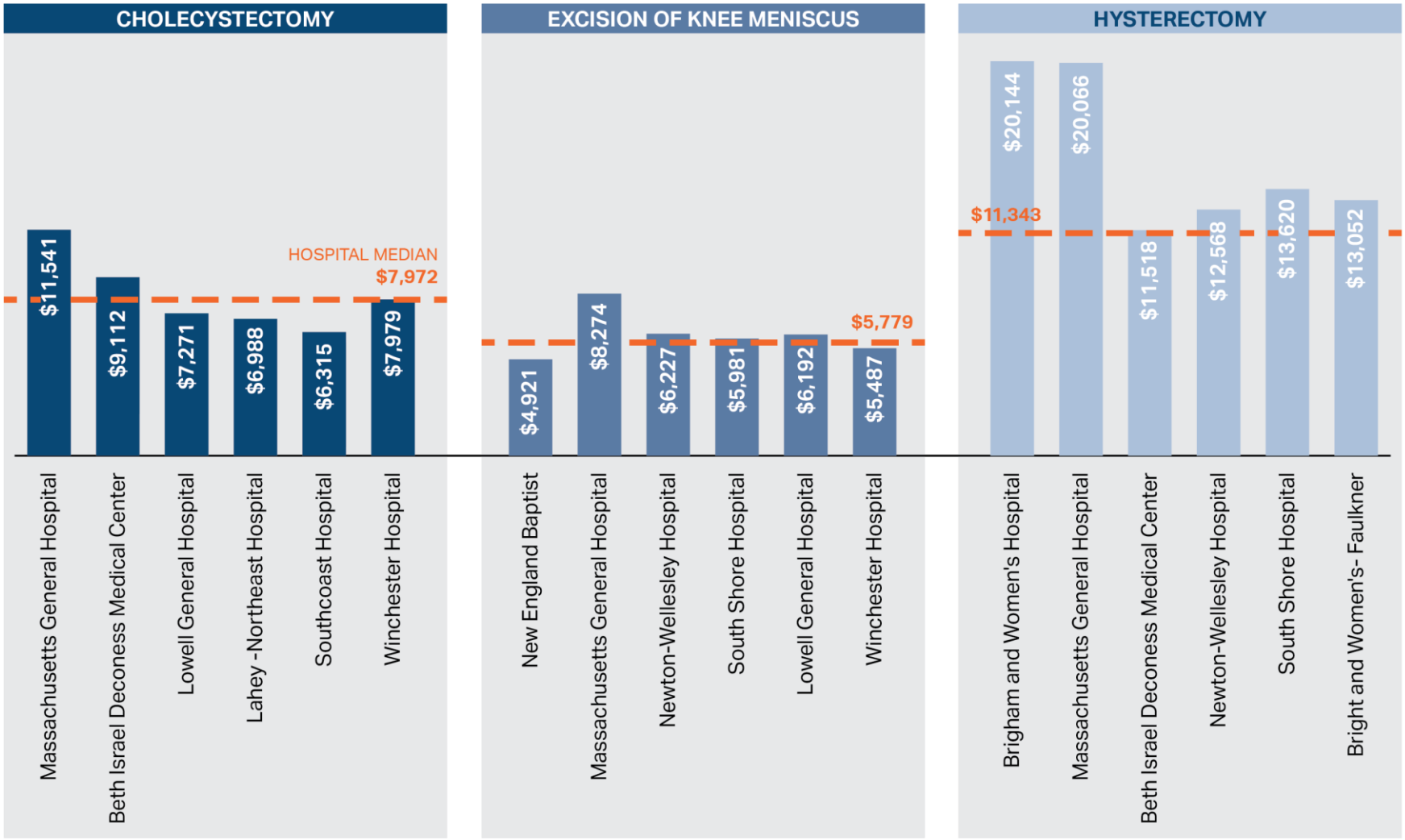


*The average payment for a **major surgery** in 2017 was **$8,955**, $710 higher than in 2015.*

Notes: Results adjusted for member months. Total spending and price includes all facility and professional claim lines associated with an encounter.
N is total number of distinct surgery encounters with at least one surgery facility fee.
Sources: HPC analysis of CHIA APCD 7.0, 2015-2017. Out of state and non-acute hospitals excluded.

Average payments for selected major outpatient surgeries at Mass General Hospital were almost double other high-volume hospitals.

Average commercial payment per encounter for major surgeries by hospital, 2017. Hospitals sorted by volume

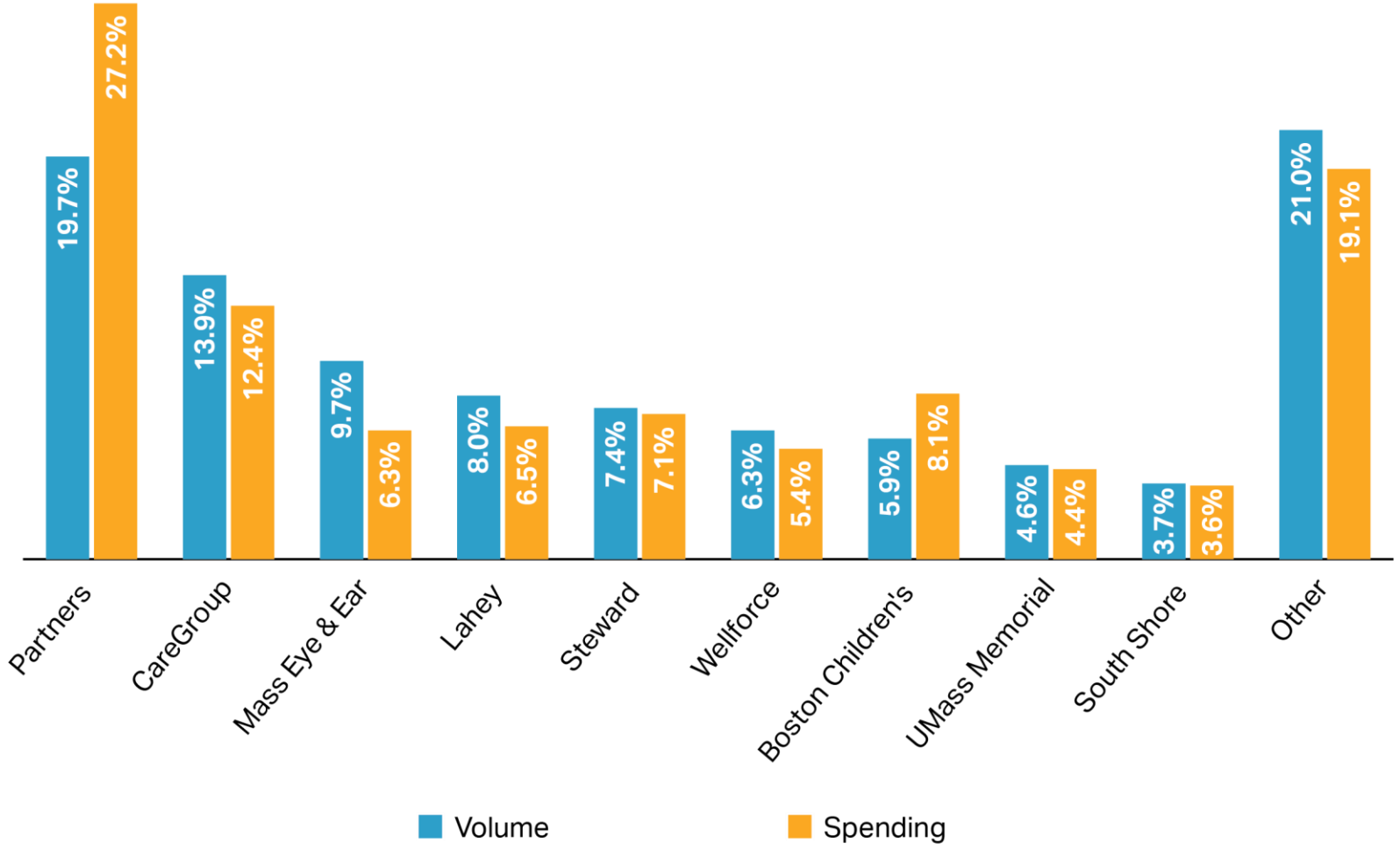


Notes: Top six hospitals by volume shown, sorted left to right by volume. Results adjusted for member months. Total spending and price includes all facility and professional claim lines associated with an encounter. N is total number of distinct surgery encounters with at least one surgery facility fee.

Sources: HPC analysis of CHIA APCD 7.0, 2015-2017. Out of state and non-acute hospitals excluded.

Partners Healthcare accounted for 20% of major outpatient surgeries in 2017 and 27% of major surgery spending.

Percent share of spending and volume in major surgeries by hospital system, 2017

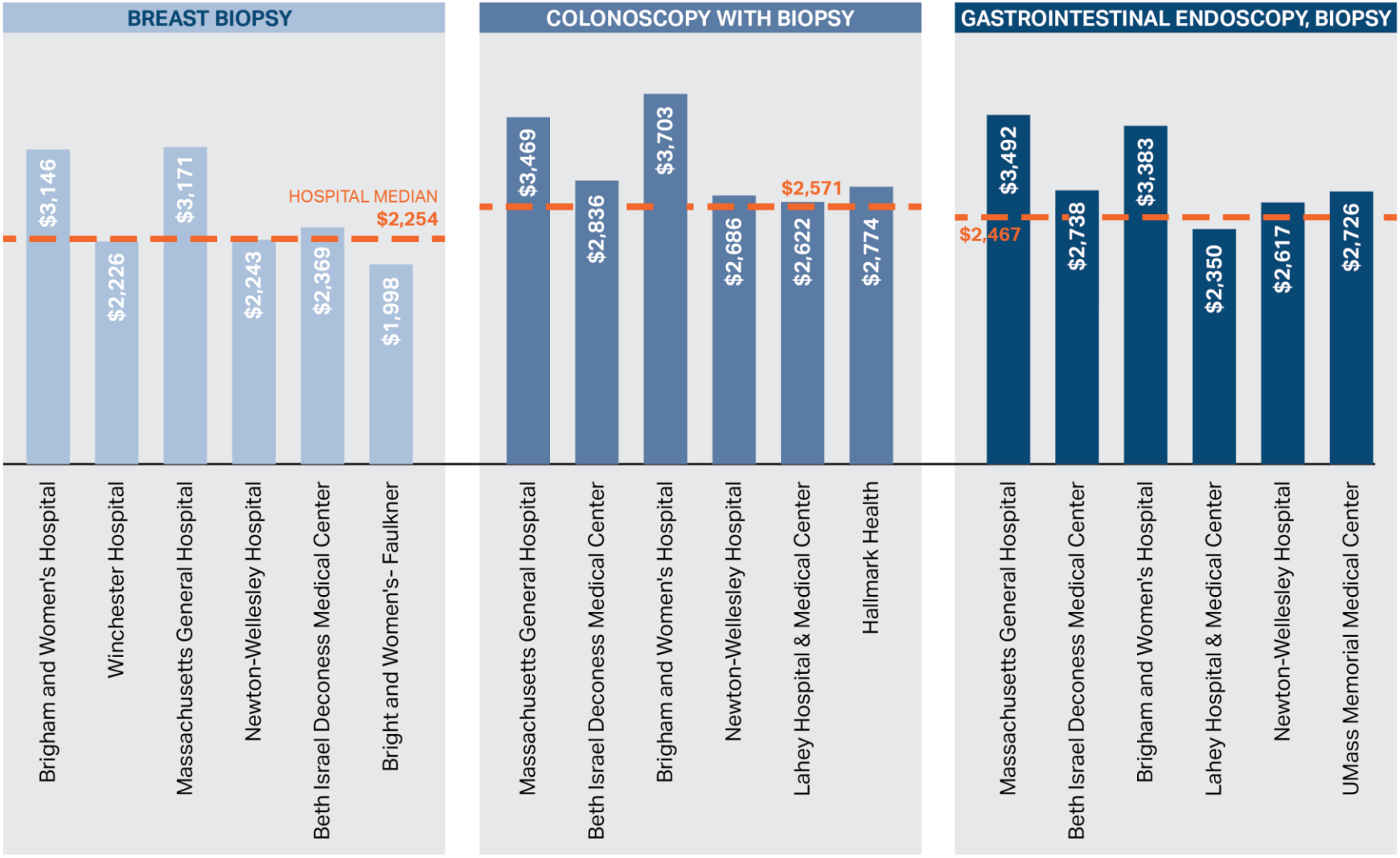


Notes: Total spending and price includes all facility and professional claim lines associated with an encounter. Volume is based on total number of distinct surgery encounters with at least one surgery facility fee. System names on the x-axis represent hospital systems as reported in the 2017 CHIA Hospital Profiles.

Sources: HPC analysis of CHIA APCD 7.0, 2015-2017. Out of state and non-acute hospitals excluded.

Average payments for minor outpatient surgeries were far higher at Brigham and Women's and Mass General hospitals.

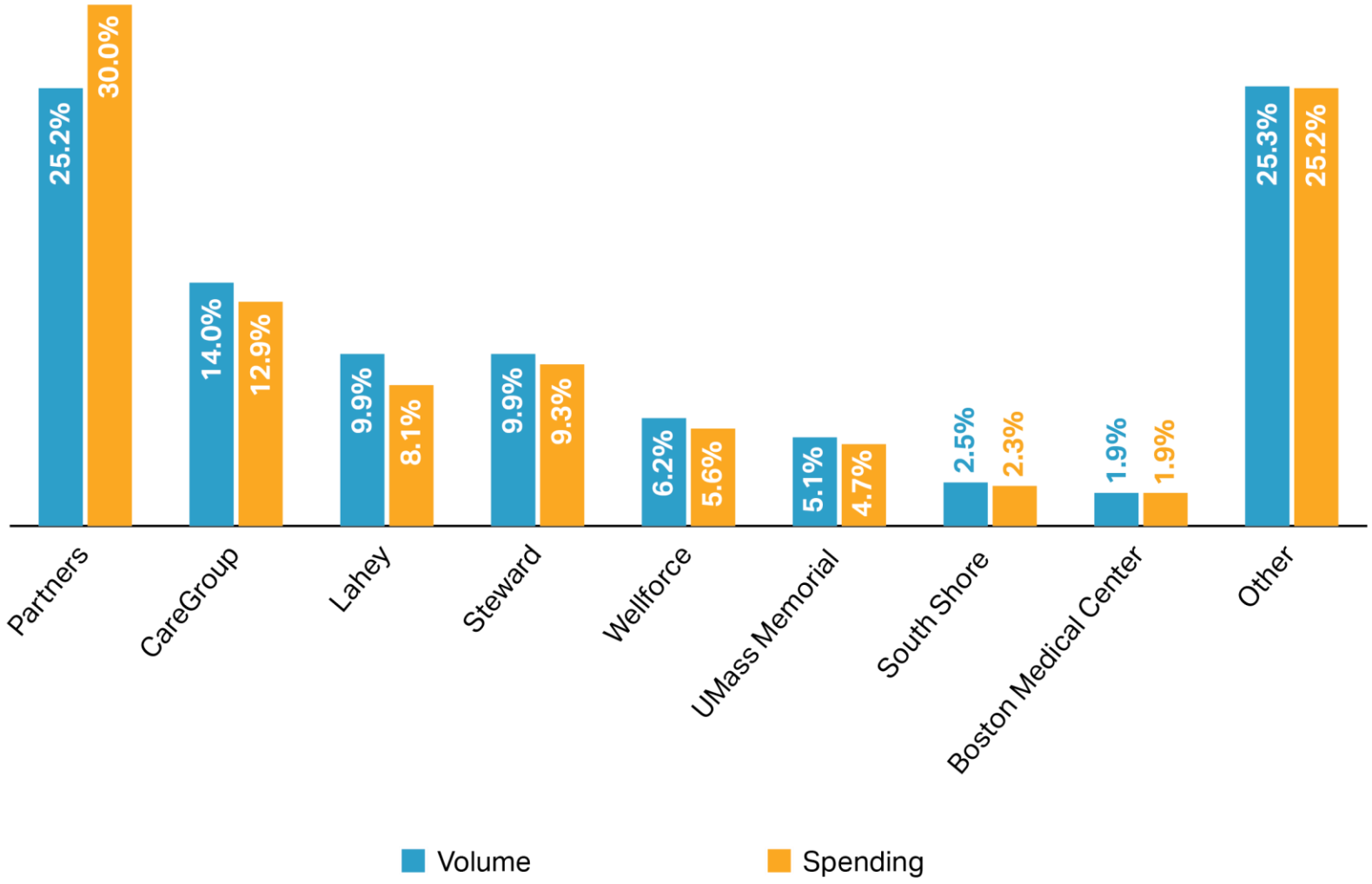
Average commercial payment for minor surgery encounters by hospital, 2017. Hospitals sorted by volume.



Notes: Top six hospitals by volume shown, sorted left to right by volume. Spending includes all facility and professional claim lines associated with an encounter .
Sources: HPC analysis of CHIA APCD 7.0, 2015-2017. Out of state and non-acute hospitals excluded.

Minor outpatient surgeries are also concentrated in higher-priced systems.

Percent share of spending and volume of minor surgeries by hospital system, 2017



Notes: Total spending and price includes all facility and professional claim lines associated with an encounter. Volume is based on total number of distinct surgery encounters with at least one surgery facility fee. System names on the x-axis represent hospital systems as reported in the 2017 CHIA Hospital Profiles.
Sources: HPC analysis of CHIA APCD 7.0, 2015-2017. Out of state and non-acute hospitals excluded.

Outpatient Spending Growth Summary

- Commercial hospital **outpatient spending growth** is driven largely by increases in average payment per major surgery encounter
  - **Hospital payments** drive the price increase more than physician payments
  - Shifts toward higher-average-payment hospitals contributed to the increase
- Volume is concentrated in higher-priced systems; **20-25% of surgeries** are performed at Partners hospitals, which are paid **up to twice as much** as other high-volume hospitals.
- Shifting care from inpatient to **outpatient settings** can save money
  - However, savings are limited because lower-priced systems are **losing volume** to higher-priced systems (which can be **cost *increasing***.)
  - For example, despite significant shifting of hysterectomy procedures from inpatient to outpatient settings, average spending per procedure increased 9.5% from 2015 to 2017. The increase would have been **6.5% had volume not shifted** to higher-priced systems.

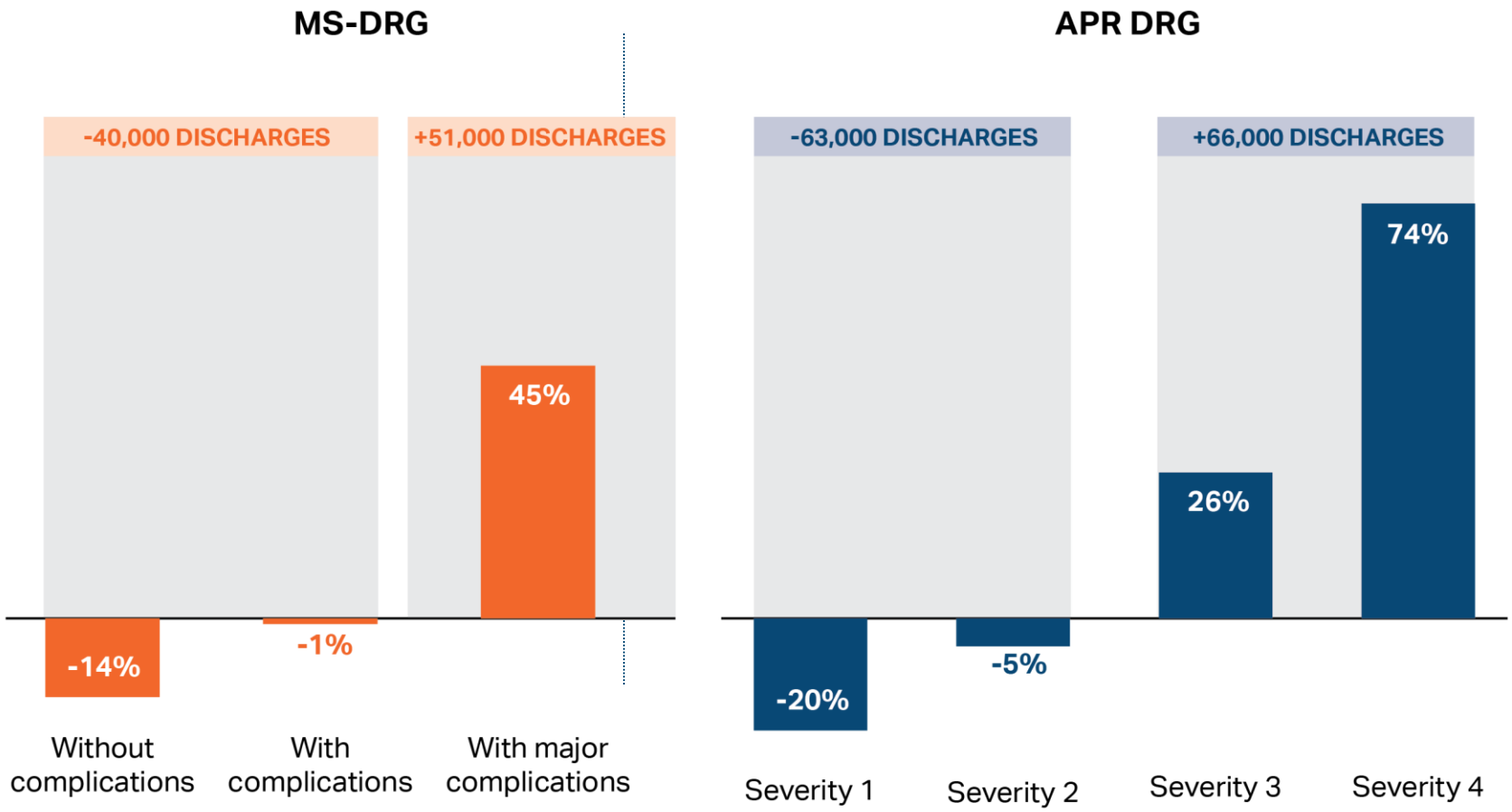
2019 HEALTH CARE COST TRENDS REPORT

APPENDIX

MASSACHUSETTS
HEALTH POLICY COMMISSION

Low-acuity discharges are decreasing while high-acuity discharges are increasing.

Change in number of hospital admissions at each severity/complications level, 2013-2018



Notes: APR-DRG Level 1 is least severe and Level 4 is most severe. MS DRG volume graph only includes the subset of DRG's that have "complications/ no complications" level embedded in them, single level DRGs are dropped from this analysis.

Sources: CHIA HIDD Acute Case-mix Database, 2013-2018; MS-DRG classification system, APR-DRG classification system

Top major surgeries by volume

	2017		Percent Change 2015 to 2017		
Procedure	N	Payment per surgery	N	Payment per surgery	Complexity (RVU)
Excision of knee cartilage	3,065	$ 6,171	-14%	4%	1%
Tonsillectomy and/or adenoidectomy	2,498	$ 6,456	8%	7%	1%
Lumpectomy, quadrantectomy of breast	2,354	$ 9,212	-8%	12%	3%
Inguinal and femoral hernia repair	2,182	$ 8,765	-3%	9%	-1%
Decompression peripheral nerve	1,926	$ 4,818	-8%	6%	1%
Lens and cataract procedures	1,922	$ 4,804	4%	8%	0%
Other hernia repair	1,755	$ 8,745	4%	6%	6%
Myringotomy	1,695	$ 4,964	11%	10%	0%
Cholecystectomy and common duct exploration	1,683	$ 8,542	-4%	4%	0%
Hysterectomy, abdominal and vaginal	1,353	$ 13,737	29%	8%	2%
Plastic procedures on nose	1,211	$ 11,668	-2%	12%	3%
Bunionectomy or repair of toe deformities	1,124	$ 7,748	-7%	7%	0%

Notes: Categories of major surgeries shown in table are among the top 15 in overall spending, have at least 1,000 surgeries in 2017, and represent at least 1 percent of total major surgery spending. Several categories in the top 15 were removed due to non-specific collections of surgeries and heterogeneity within the category; these included “other intraocular procedures”, “other OR procedures on joints,” “other OR procedures on skin,” and “other therapeutic procedures on musculoskeletal system.” Changes from 2015 to 2017 are reported on a per-member-month basis.

Source: CHIA All-Payer Claims Database v7.0, 2015-2017; AHRQ surgery flags

HPC

Top minor surgeries by volume

	2017		Percent Change 2015 to 2017		
Procedure	N	Payment per surgery	N	Payment per surgery	Complexity (RVU)
Colonoscopy and biopsy	31,111	$ 2,873	8%	-5%	0%
Upper gastrointestinal endoscopy, biopsy	15,976	$ 2,907	3%	4%	1%
Breast biopsy	6,251	$ 2,466	7%	12%	2%
Debridement of wound, infection or burn	4,391	$ 710	12%	-13%	1%
Excision of skin lesion	3,526	$ 3,019	-7%	5%	9%
Suture of skin and subcutaneous tissue	1,643	$ 1,490	19%	-12%	-6%
Abdominal paracentesis	1,225	$ 1,942	34%	1%	0%
Extracorporeal lithotripsy, urinary	1,046	$ 8,971	15%	13%	0%
Esophageal dilatation	1,021	$ 3,386	19%	8%	-1%
Dilatation and curettage (D&C)	1,000	$ 4,898	4%	10%	0%

Notes: Categories of minor surgeries shown in table were both top in overall spending, had to have at least 1,000 surgeries in 2017, and represent over 1 percent of total spending for minor surgeries.

Source: CHIA All-Payer Claims Database v7.0, 2015-2017; AHRQ surgery flags

Hospitals included in Outpatient Hospital Systems

Hospital System	Included Hospitals
Partners	• Brigham & Women's, Brigham & Women's Faulkner, Cooley Dickinson, Martha's Vineyard, MGH, Nantucket Cottage, Newton-Wellesley, and North Shore Medical Center
Care Group	• Beth-Israel Deaconess Hospital: Milton, Needham, Plymouth; Beth-Israel Deaconess Medical Center, Mount Auburn Hospital, and New England Baptist
Lahey	• Lahey Hospital & Medical Center, Northeast, and Winchester
Steward	• Morton Hospital, Steward Carney, Steward Good Samaritan MC, Steward Holy Family, Steward Norwood, Steward Saint Anne's, Steward St. Elizabeth's, and Nashoba Valley MC
Wellforce	• Hallmark Health, Tufts Medical Center, and Lowell General
UMass Memorial	• Clinton, HealthAlliance, Marlborough, and UMass MC

Notes: Mount Auburn was not owned during 2017, only affiliated. All systems not listed are only compromised of one hospital during this study period: BMC, Children's Hospital, Mass Eye & Ear, South Shore.

Source: CHIA FY2017 MA Hospital Profiles Data book Appendix A (published Dec 2018)