Trends and Tactics in National Bundled Payment Programs

Risk/Bundle Selection, Performance Monitoring, and Clinical Management

presenters
Chris Birkmeyer, EVP, Analytic Solutions, ArborMetrix
John Dickey, MD, CMO, Population Health, Sound Physicians

Today's Presenters

John Dickey, MD
Chief Medical Officer
Population Health
Sound Physicians

Chris Birkmeyer, MS
Executive Vice President
Analytic Solutions
ArborMetrix

BPCIA Enrollment…

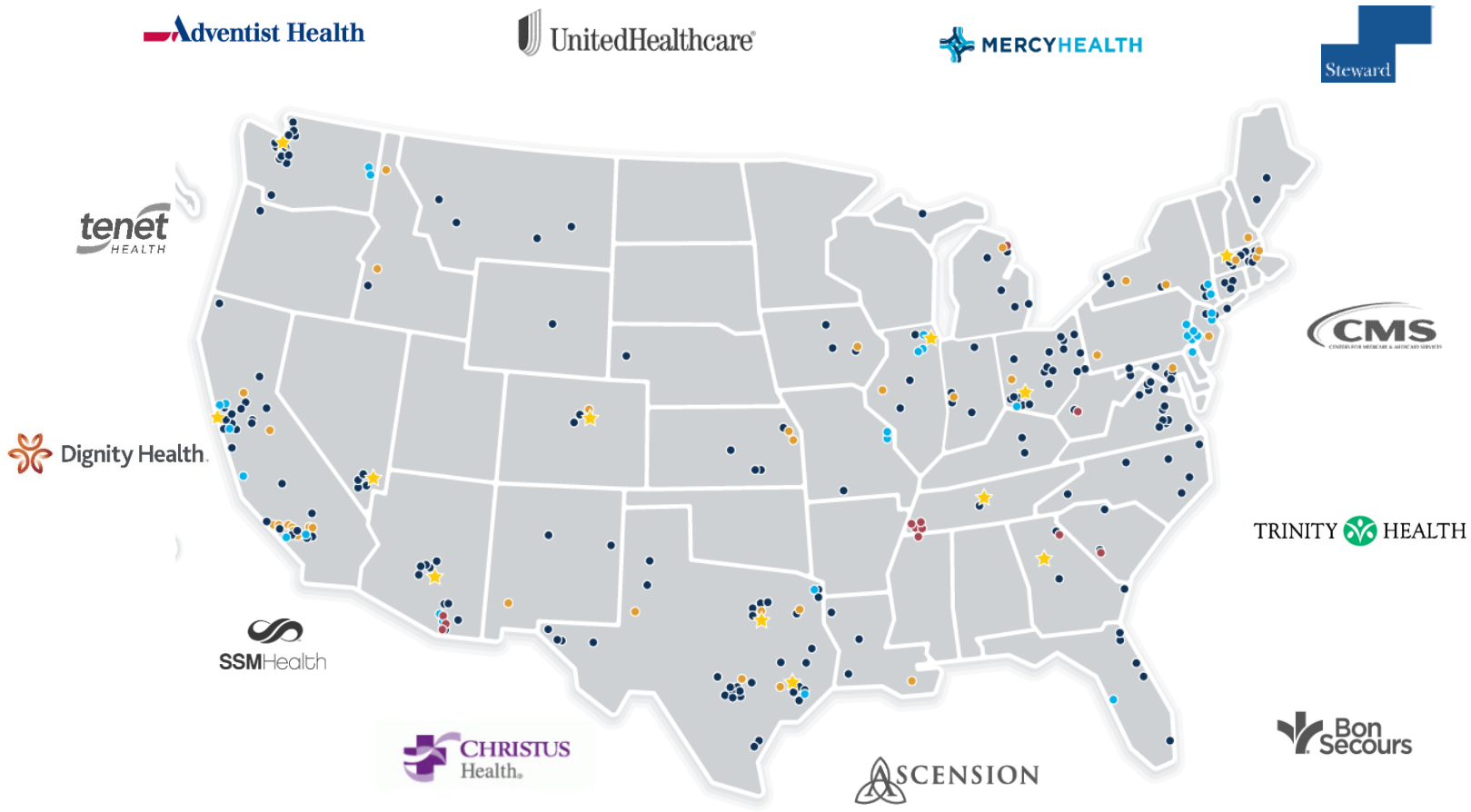
IT'S HERE!

Sound Physicians

SOUND POPULATION HEALTH

- For 20 years we have delivered exceptional results and outcomes to our hospital partners throughout the country.
- These results, coupled with a highly-engaged physician front line, have translated into success in value-based programs.

- 3,500+ employed clinicians
- 350+ hospital partners
- 40 states
- 80,000 BPCIA episodes per year—not “cherry-picked”
- 1.5M+ annual hospital admissions



Quality | Service | Teamwork | Innovation | Integrity

Sound Physicians

Our BPCIA Experience: Learn, Invest, and Improve

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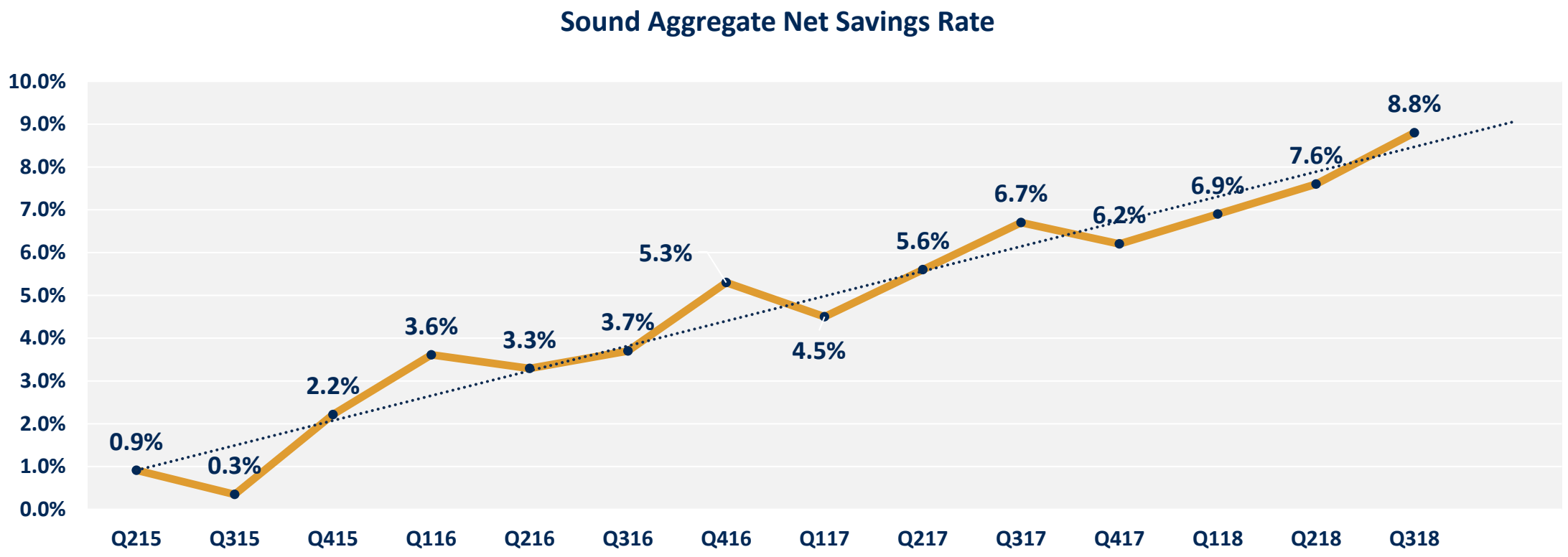

Sound Physicians

Engaged Hospitalists Drive Reduced Episode Costs

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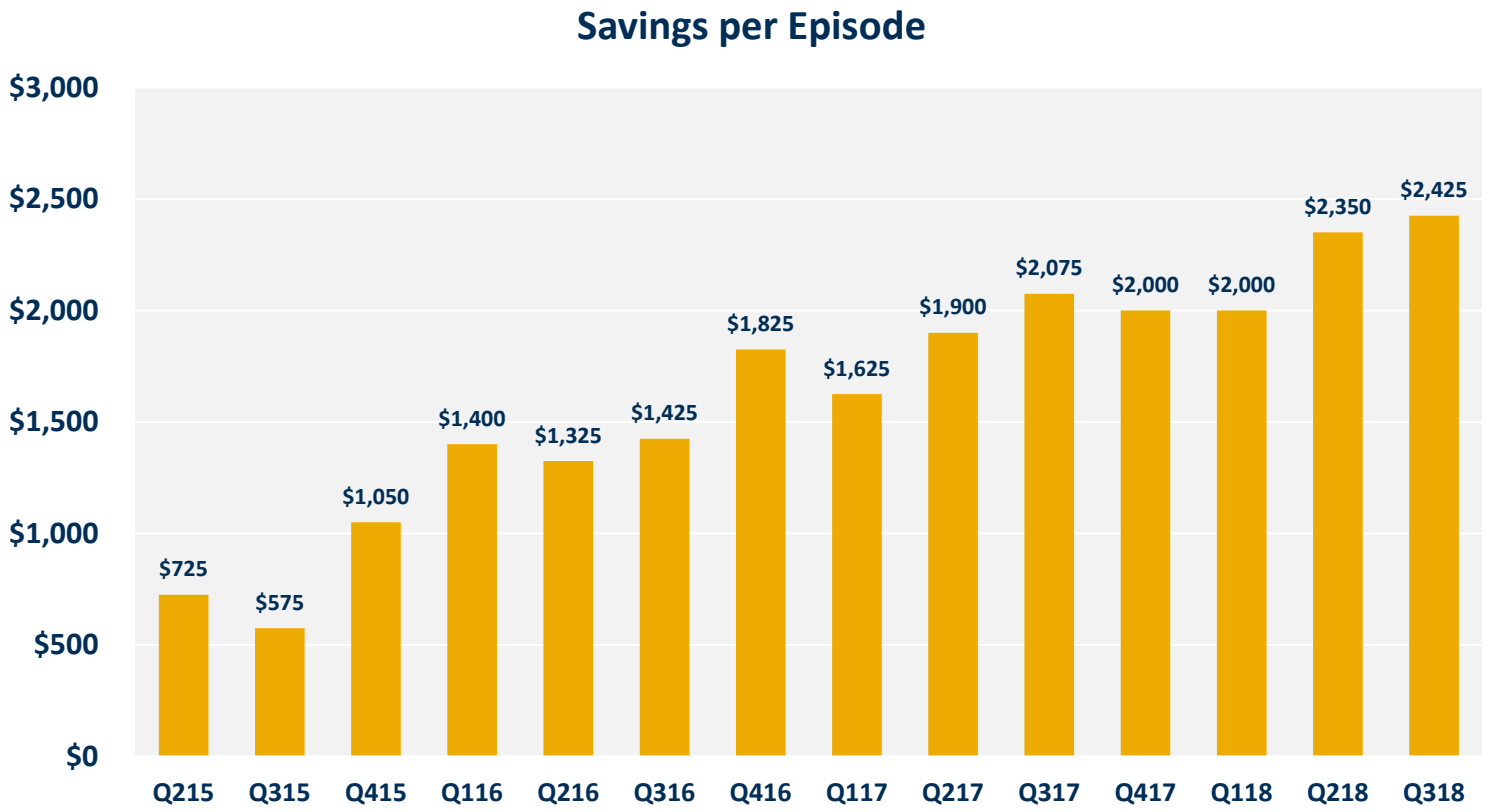


- ***Managing 80,000 episodes annually***
- ***Large clinical cross-section of population***
- ***Effective 16% post-acute savings rate***
- ***Compared to historical benchmarks:***
  - 13% more patients sent home
  - 12% reduction in SNF LOS
  - 20% reduction in readmissions

Sound Physicians

The Sound Secret Sauce

- Engaged physicians
- IT enable clinical workflows
- Strategic post-acute providers/networks
- Strong Analytics

ArborMetrix

Specify. Measure. Act.

Driving Success in BPCI-Advanced with Advanced Analytics

Today's Session

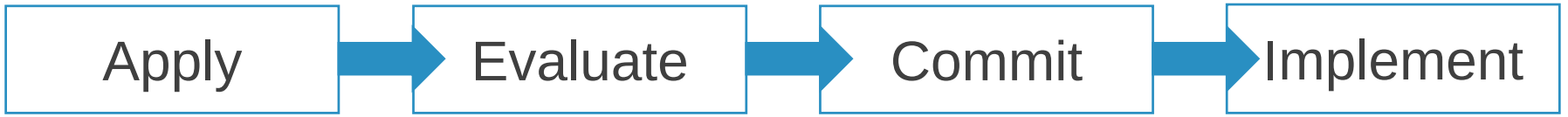
- BPCI-A methods and calculations primer
- Optimize bundle selection for maximum day one savings
  - How favorable is my target price?
  - How has my hospital changed since target price period?
  - Can I find more favorable pricing working with a PGP?
- Episode identification

BPCI-A Methods and Calculations Primer

BPCI Advanced

BPCI-A is a voluntary, nationwide model with a single retrospective bundled payment and one risk track, with a 90-day episode duration.

Model Year 3 – Application Timeline



Apply	Evaluate	Commit	Implement
April – June 2019	July – October 2019	November 2019	January 2020
Submit non-binding application by June 24	Determine whether participation would be favorable by analyzing your target price and opportunity to improve	Sign your Participation Agreement and Participation Profile by November 2019	Begin program participation in January 2020

Glossary

- ACH, CCN and Hospital may be used interchangeably
- Physician group practice, provider group, PGP, and TIN may be used interchangeably
- Bundle refers unique clinical episode category and episode type combination
- Episode refers patient-level qualifying anchor stay and 90-day post-discharge period
- Expected Episode Cost: Patient episode-level prediction of total episode spend. If episode-level data were available for all patients, the average expected episode spend / the “dollar amount” would equal the ACH efficiency.
- Favorability of Target Prices: Comparison of HBP to best estimate of what the HBP would be if HBP had unlimited signal for each ACH-Bundle combination.
- Time Zero Episode Spend: Best estimate of current episode spend for each ACH-Bundle combination at start of program.
- Clinical Improvement Opportunity: Assessment of how much opportunity exists for each ACH -Bundle combination to lower spend beyond Time Zero estimate.
- Selection Trigger: Threshold at which ACH-Bundles are selected for inclusion in savings calculation. Triggers can be based on expected $ or % improvement.

BPCI-A Financial Methodology Overview

Payment from CMS for BPCI Advanced involves:

- Standard Medicare FFS payments during episodes
- Retrospective reconciliation semi-annually during the program year
- Reconciliation compares all actual non-excluded Medicare FFS expenditures for a Clinical Episode to the final Target Price for that Clinical Episode
- Positive Reconciliation Amount, paid to Episode Initiators occurs when FFS payments for an episode are lower than the Target Price
- Negative Reconciliation Amount, paid by Episode Initiators occurs when FFS payments for an episode are higher than the Target Price
- Netting all Positive and Negative Reconciliation Amounts across all Clinical Episodes results in a Positive or Negative Total Reconciliation Amount
- In other words, NPRA = Target Price minus actual FFS expenditures
- For a full methodology description please see:

https://innovation.cms.gov/Files/fact-sheet/bpci-advanced-generalfs.pdf

Target Price Methodology

Target prices are set based on historical performance of episode initiator (hospital or provider group)

Minimum Case Volume

41 cases

Time Period

2013-2016

Small sample sizes on old episodes create significant opportunity for Bundle optimization

CMS Target Price Components

Hospital Level Calculations

- Step 7: Dollar Amount – Average predicted spending for all baseline episodes across all ACHs for a given Bundle
- Step 8: ACH Efficiency Measure – Hospital Observed/Expected ratio
- Step 9: SBS (standardized baseline spending) – Dollar amount * ACH efficiency measure
- Step 10: PCMA – Hospital Patient Case Mix Adjustment
- Step 11: PAT Factor – Peer Adjusted Trend
- Step 12: HBP – Hospital baseline price

PGP Adjustments

- Step 13: PGP efficiency measure – PGP observed/expected ratio
- Step 14: PGP Offset – PGP efficiency / Hospital efficiency
- Step 15: PGP Relative Case Mix – PGP PCMA / Hospital PCMA
- Step 16: PGP-ACH Benchmark Price

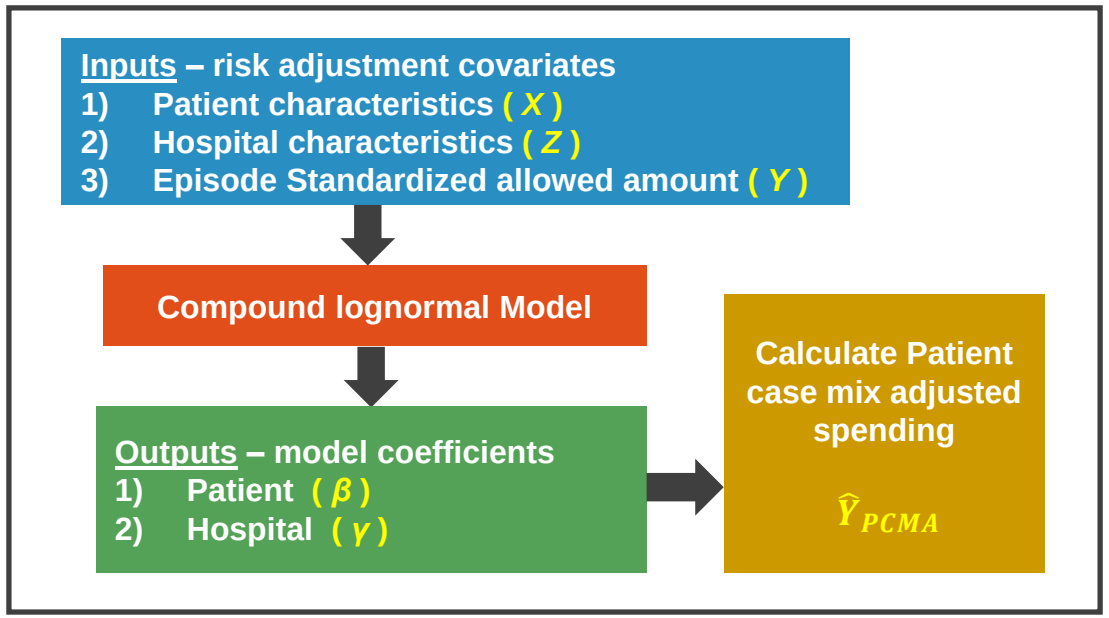
Final Calculations

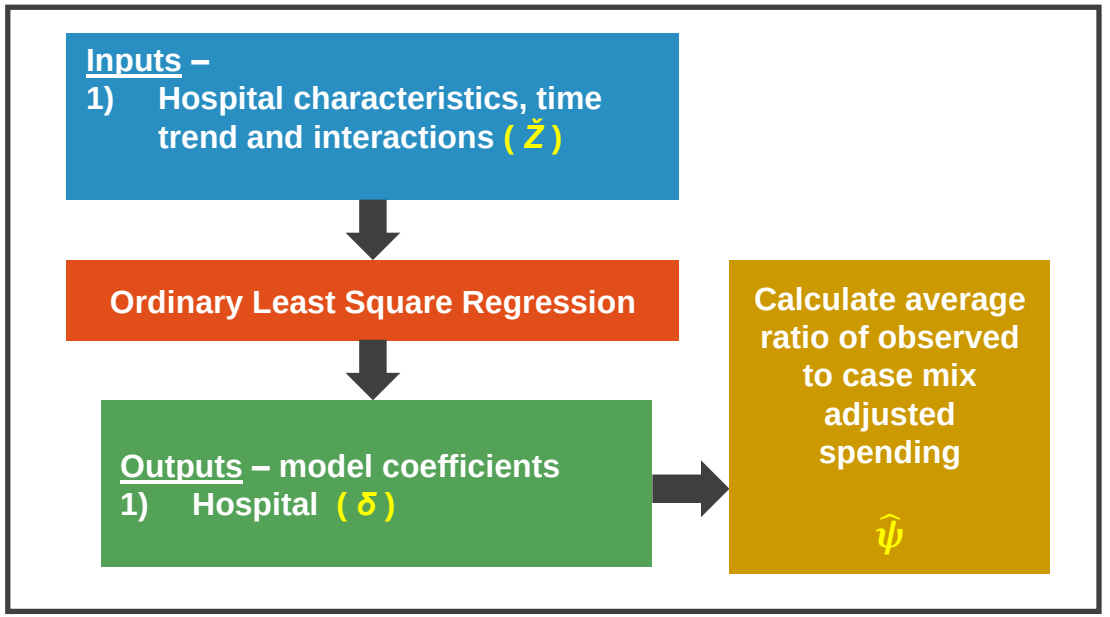
- Step 17: Preliminary Target Price (Benchmark Price * 0.97)
- Step 18: Ratio of real to standardized dollars for the hospital

CMS Statistical Methods

Replicated CMS calculation to obtain predicted clinical episode spending

- Used supplied documentation on 2 stage model – Patient Case-mix Adjustment
- **Compound lognormal** (CL) & **ordinary least square regression** (OLS) – Peer adjusted trend

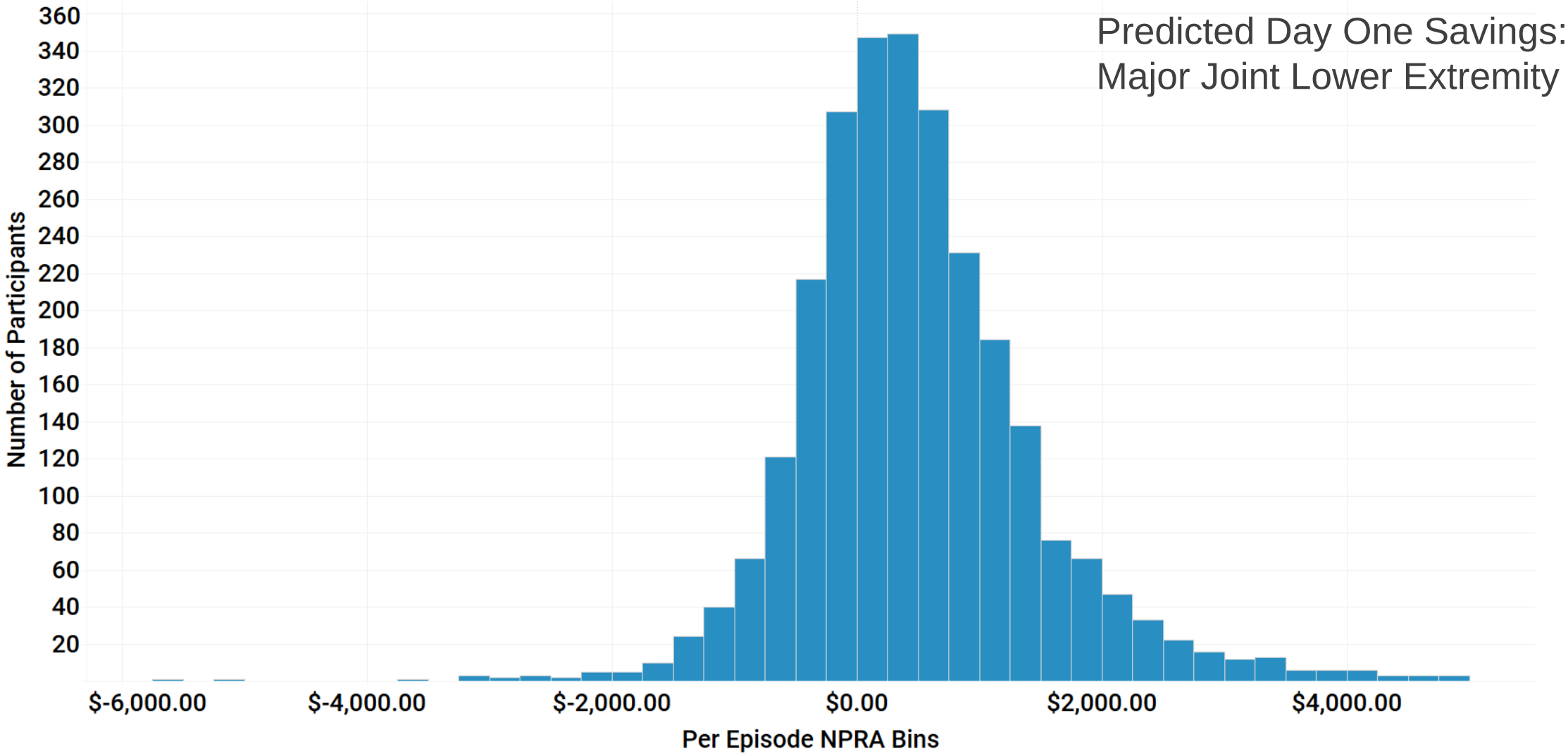




https://downloads.cms.gov/files/cmmi/bpciadvanced-pricingmethodology-techreviewwebinar-slides.pdf
https://innovation.cms.gov/Files/x/bpciadvanced-episodecreationspecs-yr1-2.pdf

Optimizing Risk/Episode Selection

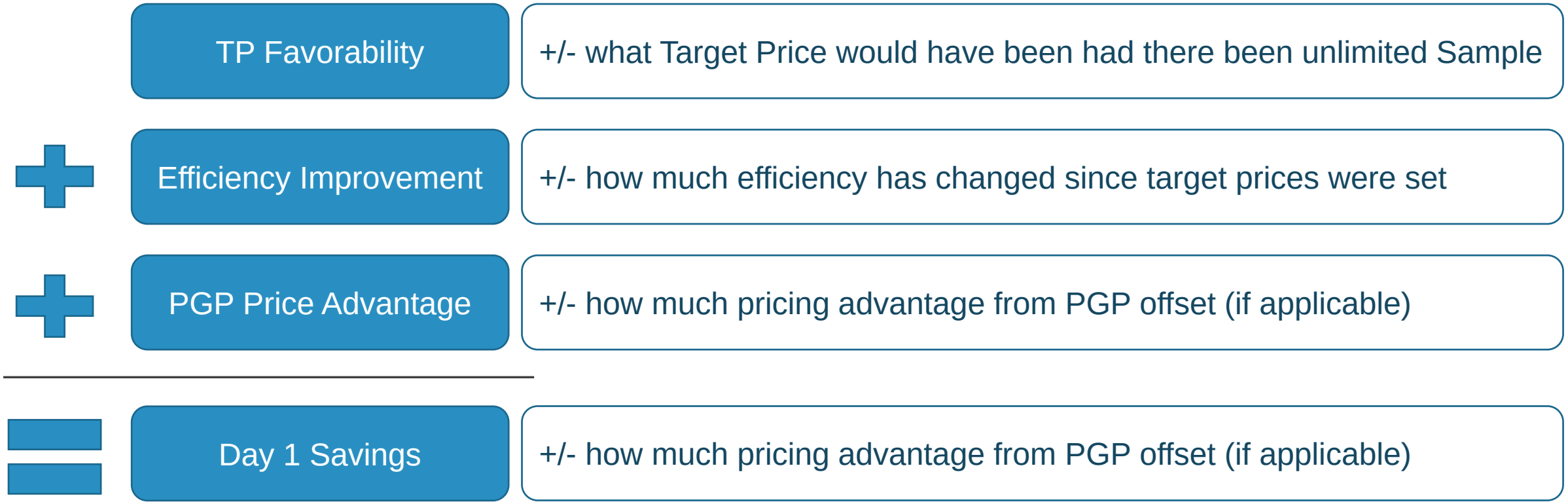
Day 1 Savings Can Vary Widely



Data Sources for Analysis

- Applications included 326 distinct CCNs. This comprised 8,802 CCN, Episode type & Clinical episode category combinations
- Data included:
  - Target price details at both CCN & PGP level
  - Target price components
  - Episode details for Sound initiated episodes only
- Data were supplemented by CMS Limited Data Set (LDS) files (100% sample) to extend claims through 2018

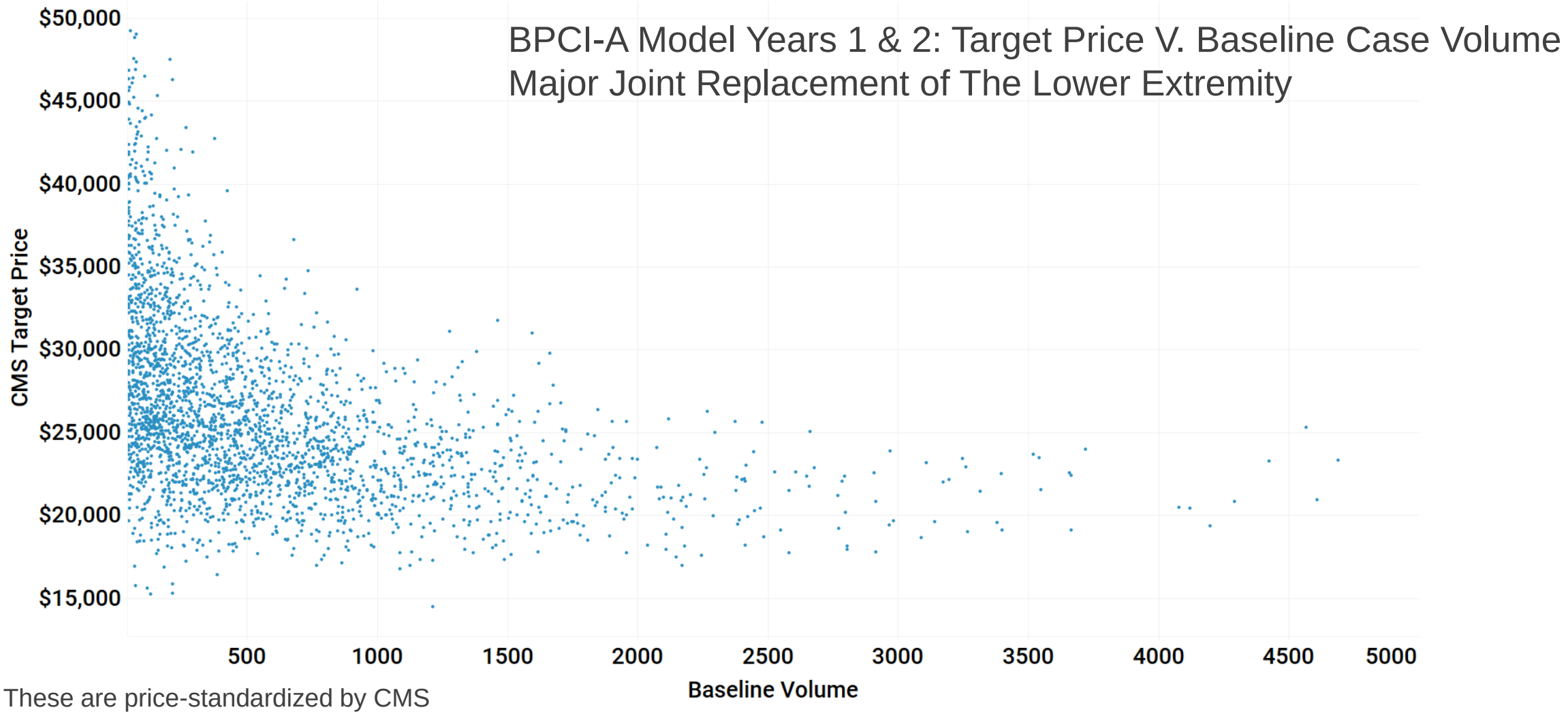
Savings Opportunity Methodology Overview



Questions to Consider

1. How favorable is my target price?
2. How has my hospital changed since target price period?
3. Can I find more favorable pricing working with a PGP?

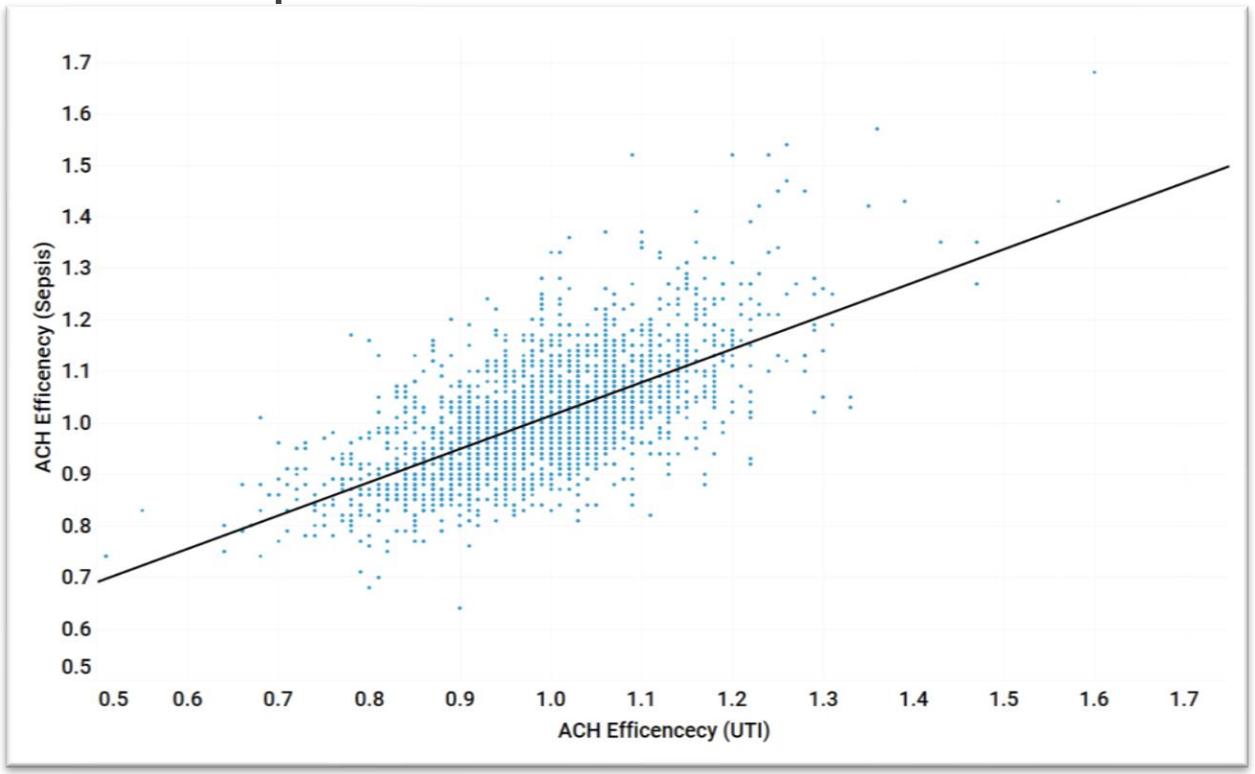
Target Prices Have Significant Variability



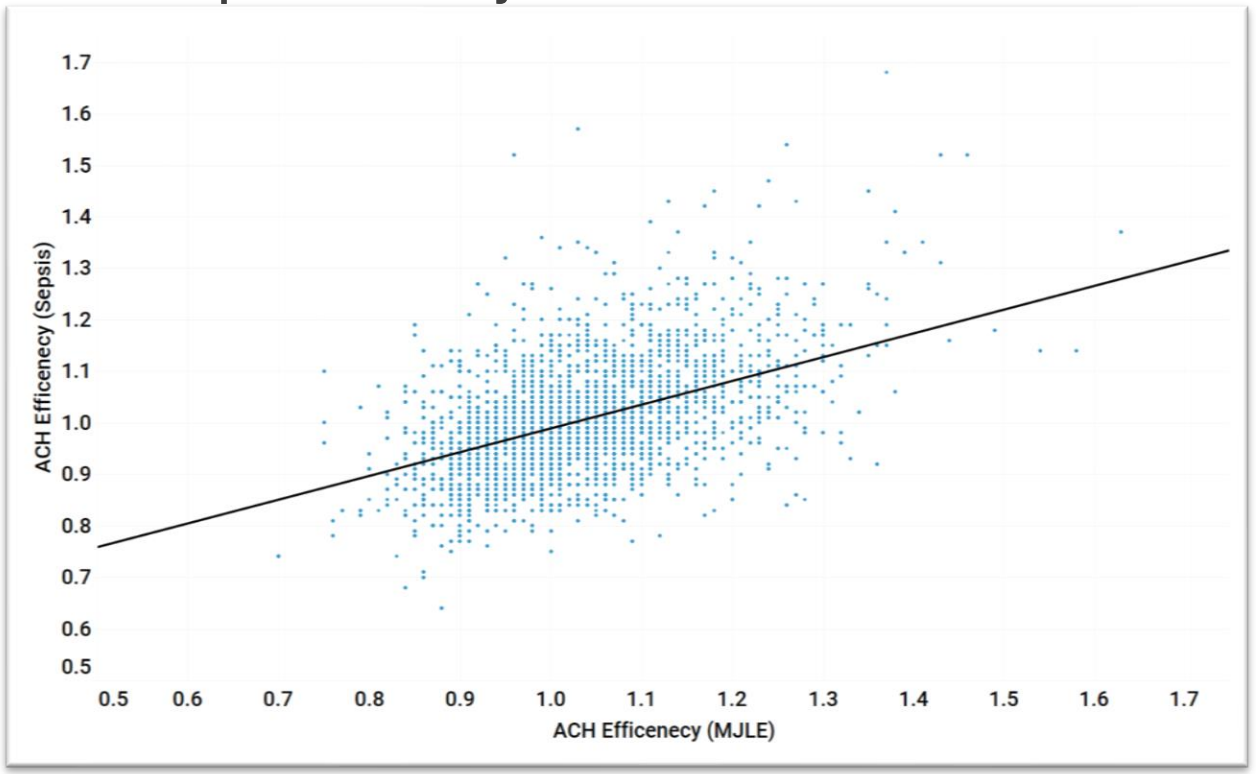
NOTE: These are price-standardized by CMS

Hospitals Have Predictable Utilization Patterns

Sepsis & UTI Bundles – R2=.412



Sepsis & Maj Joint: LE – R2=.216



Methodology – Target Price Favorability

Target Price Favorability =

(Hospital Baseline Price [HBP] * Signal)

\+ (Predicted HBP * (1 – Signal))

Where as:

HBP is provided by CMS

Signal is derived through reliability adjustment based on Clinical Episode Category and sample size

Predicted HBP is result of modeling exercise

More Methodology – Target Price Favorability

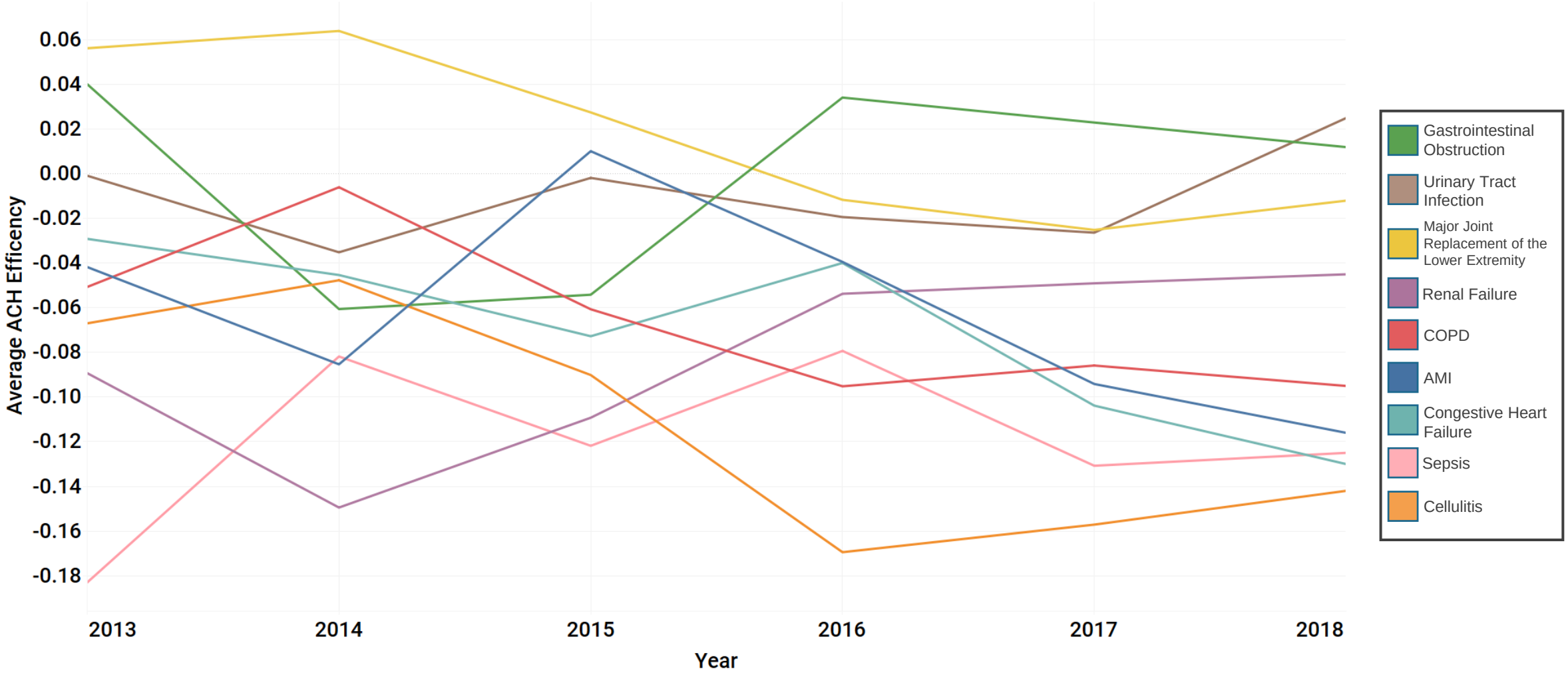
Predicted HBP is a weighted average of:

- Actual efficiency measure in the clinical episode category (O/E from target price file)
- Proxy measure in the clinical episode category (model based on patient factors and post-discharge utilization)
- Actual efficiency measure from all other clinical episode categories
- Proxy measure from all other clinical episode categories

The weights depend on:

- Signal covariance and variance
- Patient-level error variance in each measure
- Sample sizes for each measure

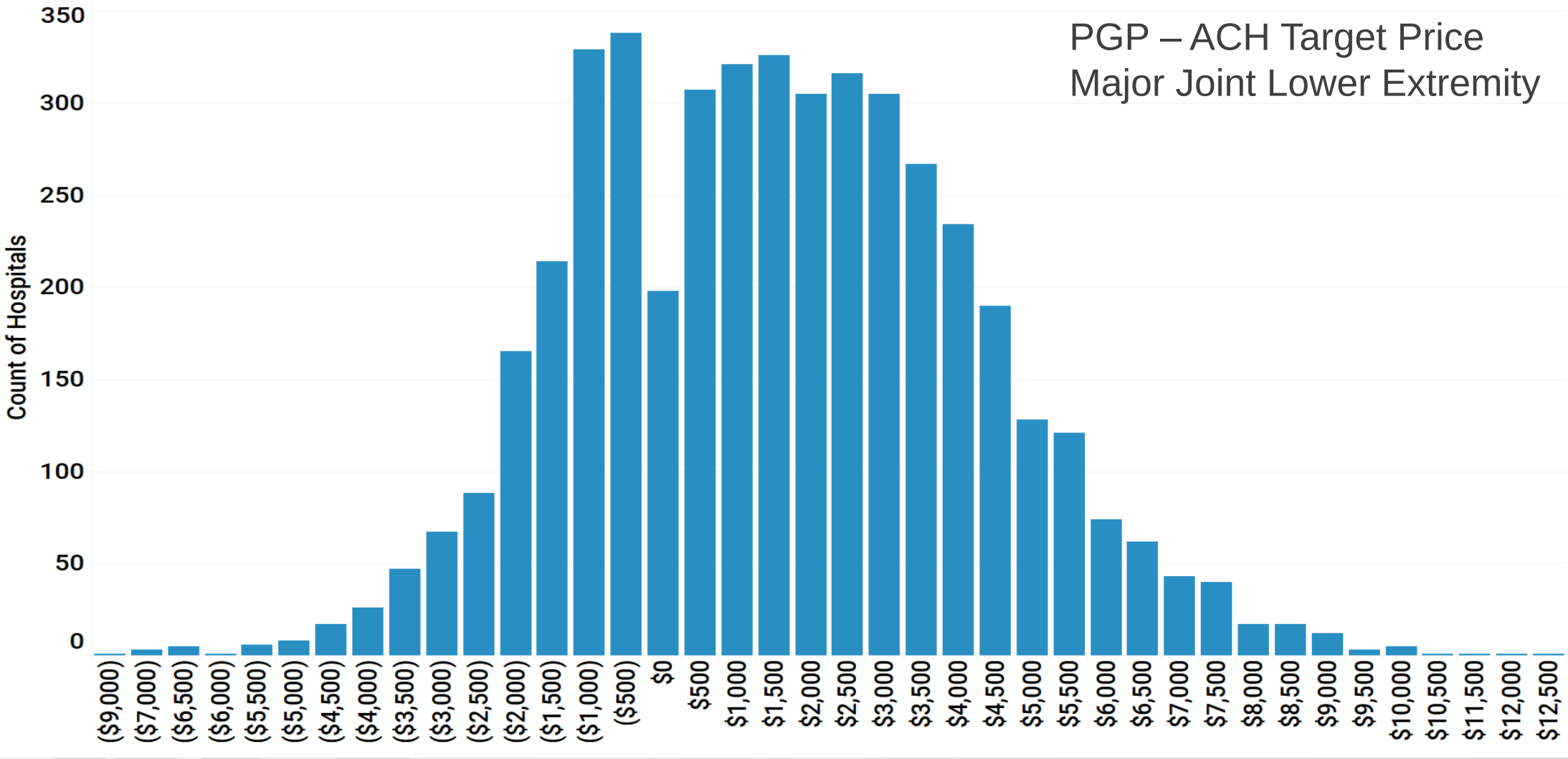
Years Have Passed Since Target Prices Were Set



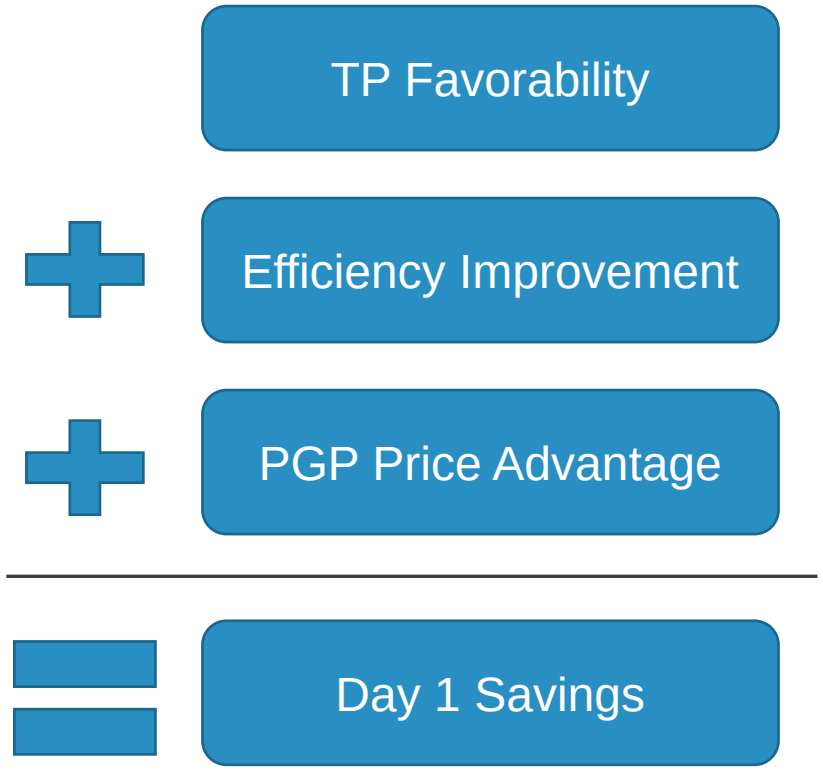
Methodology – Efficiency Improvement

- Reliability-adjusted hospital episode trend. Based on proxy models both within bundle and from related bundles, best estimate in change in spend from target price period to day one. This trend is multiplied by the reliability adjusted HBP to estimate Time Zero spend.

PGP Pricing Can Be Very Different



Predicting Day 1 Savings – Example Hospital



NPRA Components by Bundle

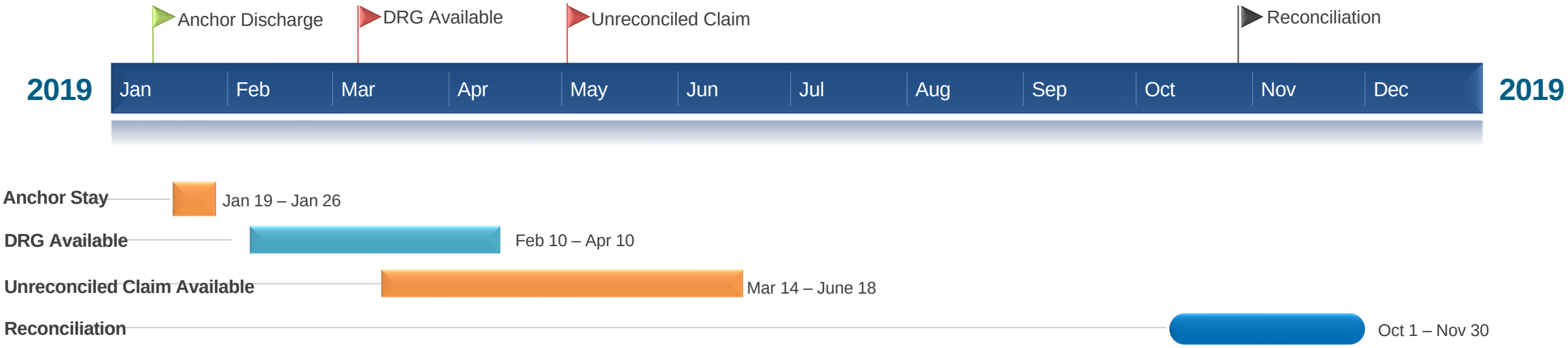
Bundle Name	TP Favorability	Efficiency Improvement	PGP Price Advantage	3% Discount	Per Case Savings	Episode Volume	Total NPRA
AMI	$457	$1,029	$534	($842)	$1,177.97	107	$125,749
Back & Neck	$4,231	$1,278	$8,514	($1,062)	$12,961.75	31	$395,333
CABG	$215	$1,390	$3,361	($1,767)	$3,198.65	67	$213,510
Cardiac Arrhythmia	$386	$510	$595	($637)	$853.03	227	$193,851
Cardiac Difibrillator	$802	$1,459	($829)	($1,794)	($361.45)	27	($9,669)
Cardiac Valve	$1,200	$1,387	$8,641	($2,023)	$9,203.52	37	$335,929
Cellulitis	($105)	($472)	($105)	($616)	($1,297.99)	156	($202,487)
Cervical Spinal Fusion	($86)	$121	$642	($973)	($296.69)	26	($7,788)
CHF	($174)	$171	$1,887	($784)	$1,100.55	360	$395,924
Comb. Ant/Post Spinal Fusion	($1,114)	$1,527	$4,026	($1,806)	$2,634.28	14	$36,880
COPD, Bronchitis/Asthma	($169)	$412	$644	($611)	$276.11	315	$87,044
Disorders of Liver	($1,105)	$254	$4,449	($845)	$2,753.51	49	$134,234
Fractures Femur/Hip/Pelvis	$999	$1,010	$2,463	($1,121)	$3,351.33	42	$139,080
GI Hemorrhage	$212	($276)	$0	($702)	($765.29)	182	($139,282)
GI Obstruction	($105)	$370	$1,254	($532)	$987.11	134	$132,273
Hip/Femur Procedures	$44	$1,367	$2,433	($1,490)	$2,354.41	151	$354,339
LE Procedures	$187	$2,081	$3,331	($1,288)	$4,310.63	65	$279,113
Major Bowl Procedure	($47)	$243	$5,500	($1,111)	$4,584.63	133	$607,463
Major Joint LE	($8)	$1,368	$1,479	($732)	$2,107.75	880	$1,854,824
Major Joint UE	($125)	$956	$4,384	($731)	$4,484.58	57	$256,742
Pacemaker	$305	$583	$1,174	($917)	$1,145.33	91	$103,652
PCI	($21)	$61	$1,695	($856)	$878.12	210	$184,406
Renal Failure	$117	$526	$1,019	($780)	$882.72	359	$317,119
Sepsis	($113)	$1,330	$759	($1,103)	$872.64	552	$481,481
Simple PNA & Resp Infect	$90	$762	($120)	($733)	($1.28)	413	($530)
Spinal Fusion	$104	$1,810	$908	($1,418)	$1,404.40	42	$58,283
Stroke	$38	$2,966	$348	($1,066)	$2,286.56	329	$751,135
UTI	$162	$1,400	$961	($743)	$1,780.32	295	$524,750

What is My Opportunity to Improve?

Assessing performance on key utilization metrics and cost measures is key to understanding whether a bundle offers sufficient opportunity to improve relative to target prices.

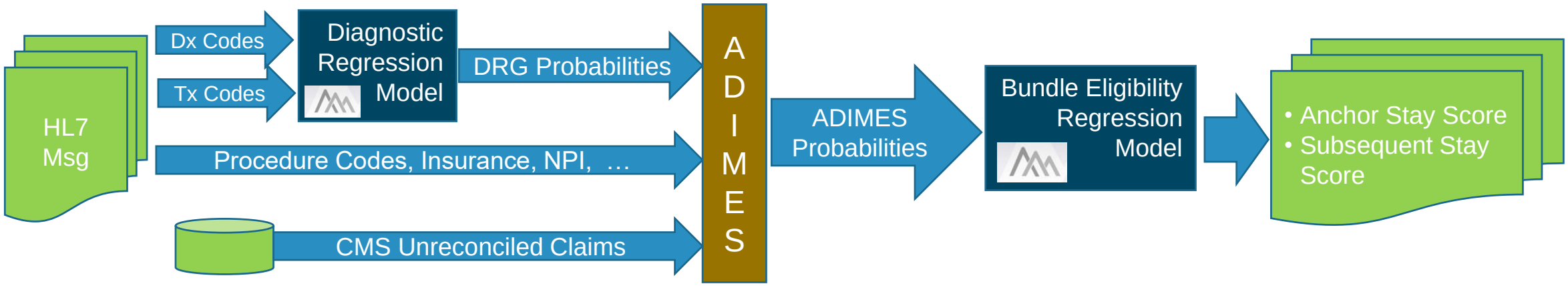
Episode Identification

BPCI-A Identification Challenge



- The data which identifies a stay as definitively at-risk in BPCI-A aren't available until the episode is over.
- Episode management requires predicting eligibility

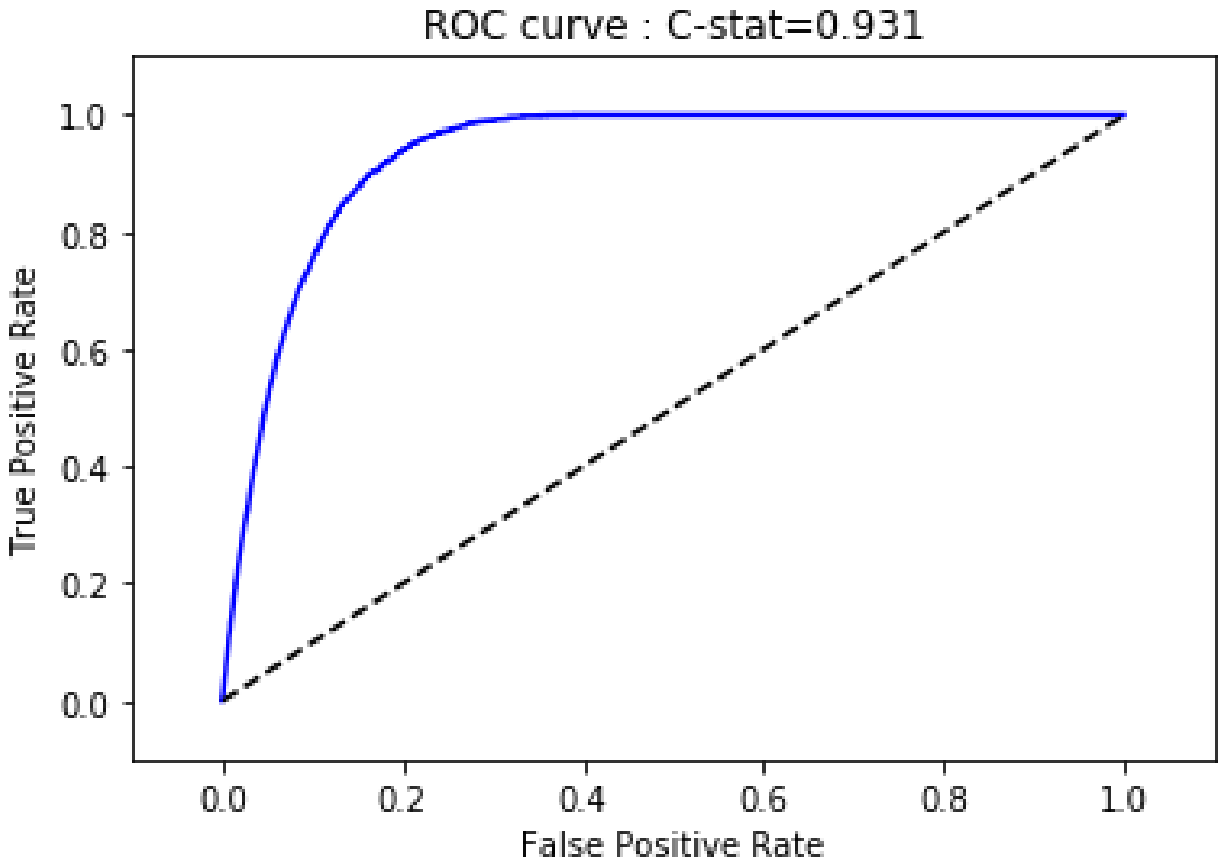
Arbor Bundle Eligibility Modeling Approach
Multiple, hierarchical regression models

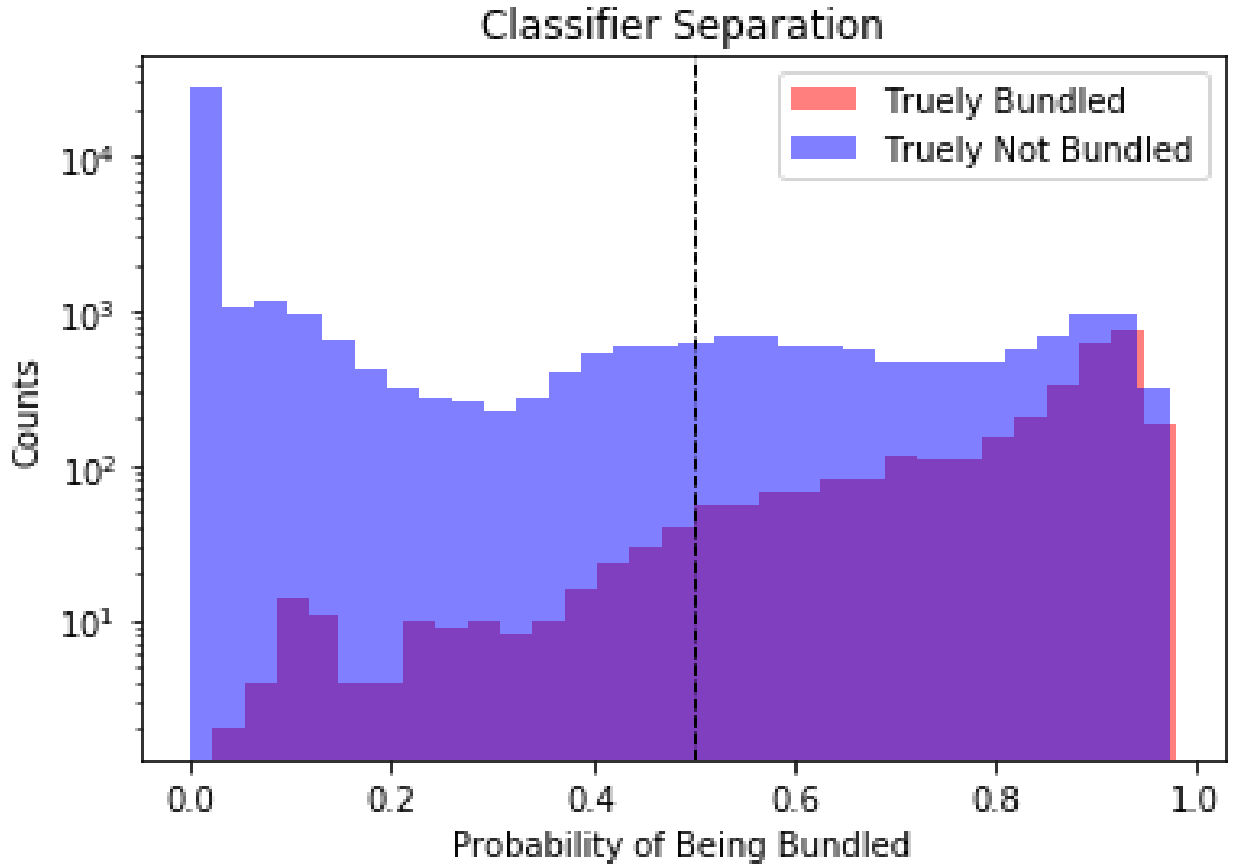


1. DRG Model uses HL7 Diagnosis Codes
   - HL7 Diagnostic Codes are used to predict DRG probabilities (Diagnostic Regression Model)
   - DRG predictions are filtered by TIN/Bundle eligibility based on Sound participation
   - ADIME + Subsequent Stay probabilities are used to predict Bundle Eligibility (Bundle Eligibility Regression Model)
   - Real-time data are supplemented with CMS unreconciled claims

2. Bundle Eligibility Model uses ADIMES probabilities [0-100]
   - Attending Physician probability
   - Diagnostic (DRG) eligible BPCIA Episode at TIN
   - Inpatient Stay
   - Medicare Eligible Stay
   - Exclusions to BPCIA for stay/patient
   - Subsequent stay to ongoing episode (Readmission)

You Can Predict BPCI-A Eligibility in Real-time





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Population Health BPCI-A Webinar

Agenda

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- Measuring the right things
- Driving accountability
- Insights that foster improvement

Application of Analytics to Improve Performance:
Measuring the Right Things

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Operators and Finance

Hospital Leaders

Front Line Physicians

Application of Analytics to Improve Performance:
Claims-based Reporting for Operators and Finance

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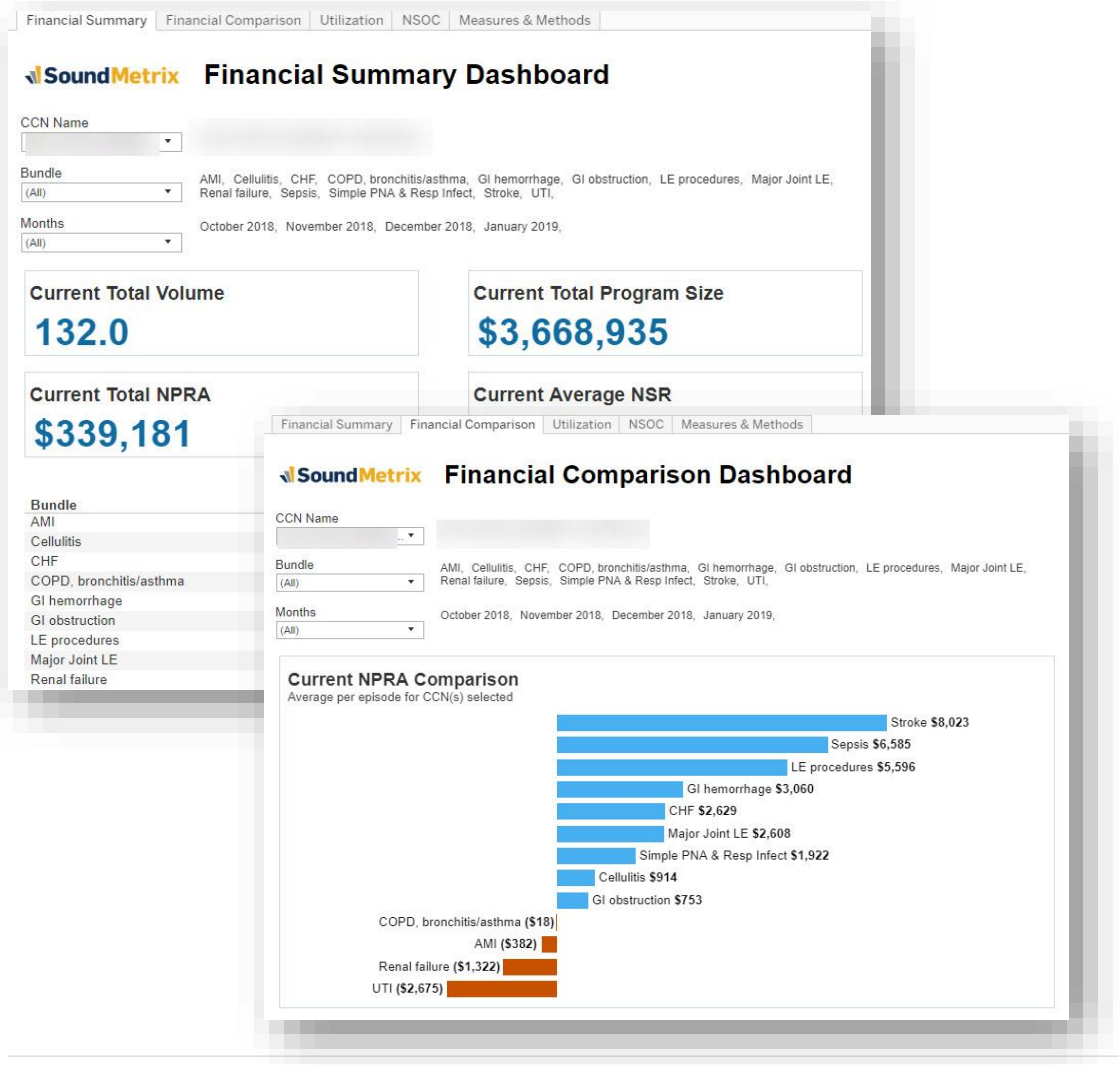

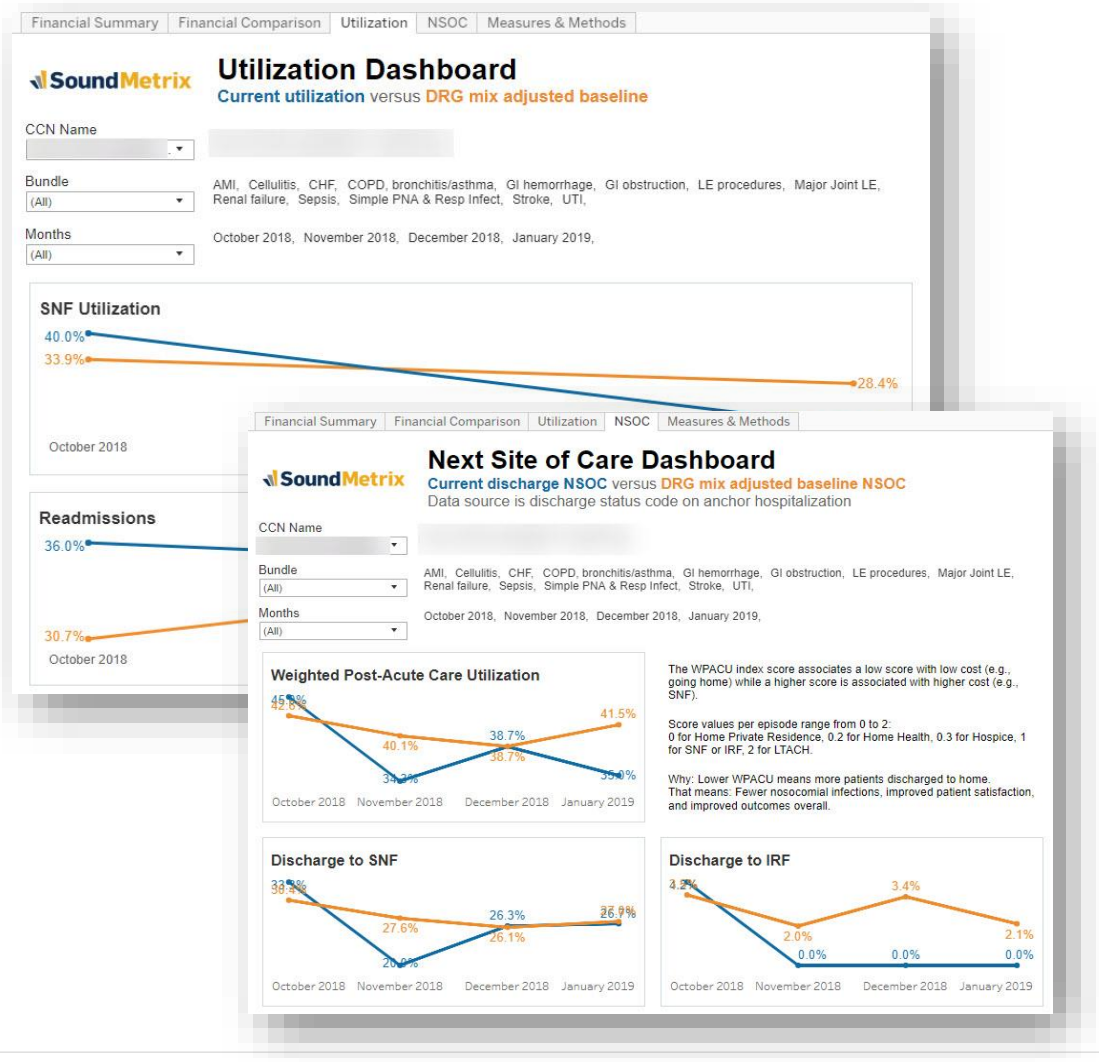

Application of Analytics to Improve Performance

Hospital Leaders: Dashboard for Benchmark Performance

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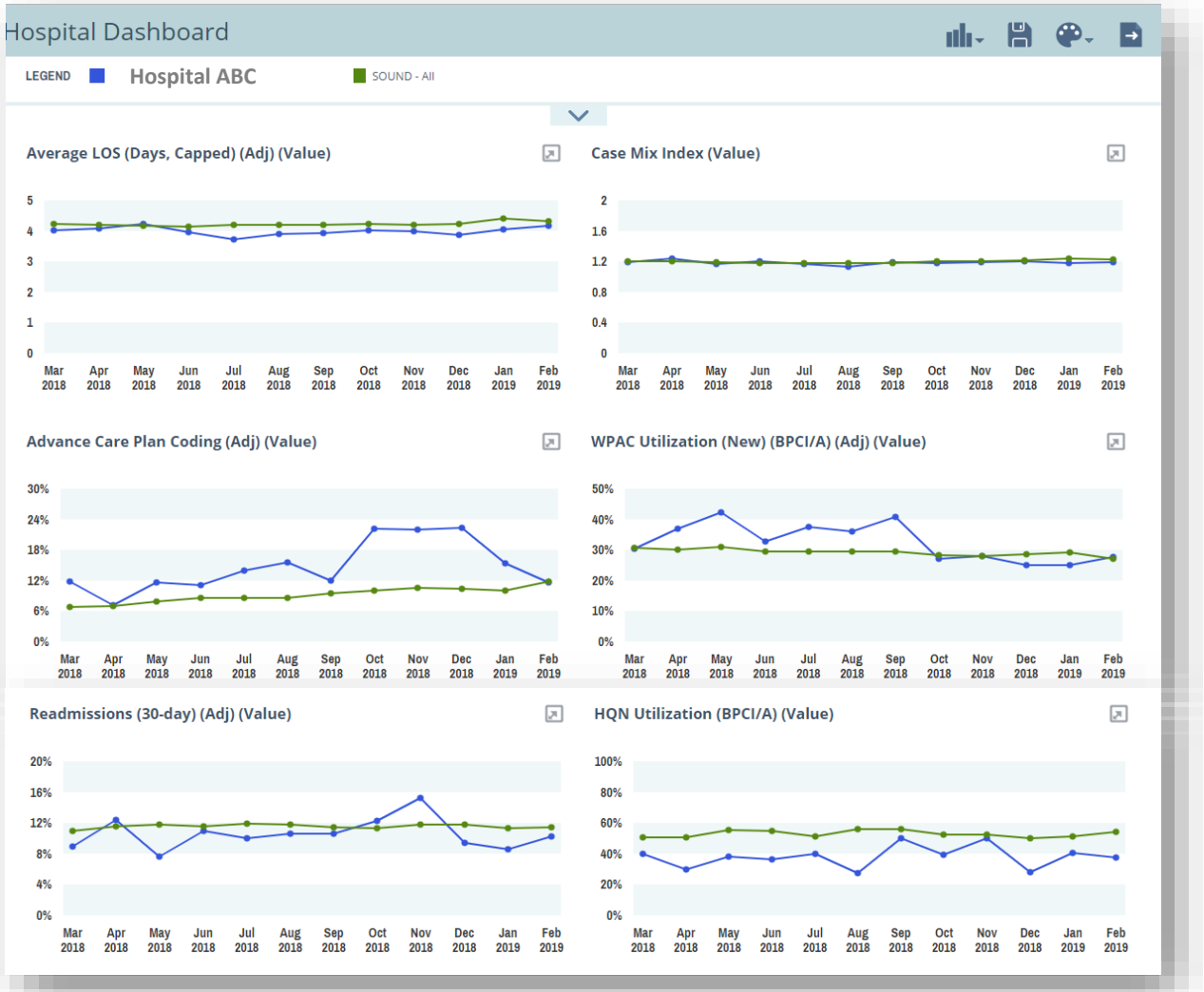
Trended performance for key indicators at-a-glance

- **wPACU**
- **NSOC**
- **ACP Coding**
- **Readmissions**
- **HQN Utilization**
- MIPS, HCAHPS, LOS, CMI, Acuity, Volume

Drill to detail

- Specific time grain
- Clinician level
- Patient level



Application of Analytics to Improve Performance

Hospital Leaders: Program Results & Reporting

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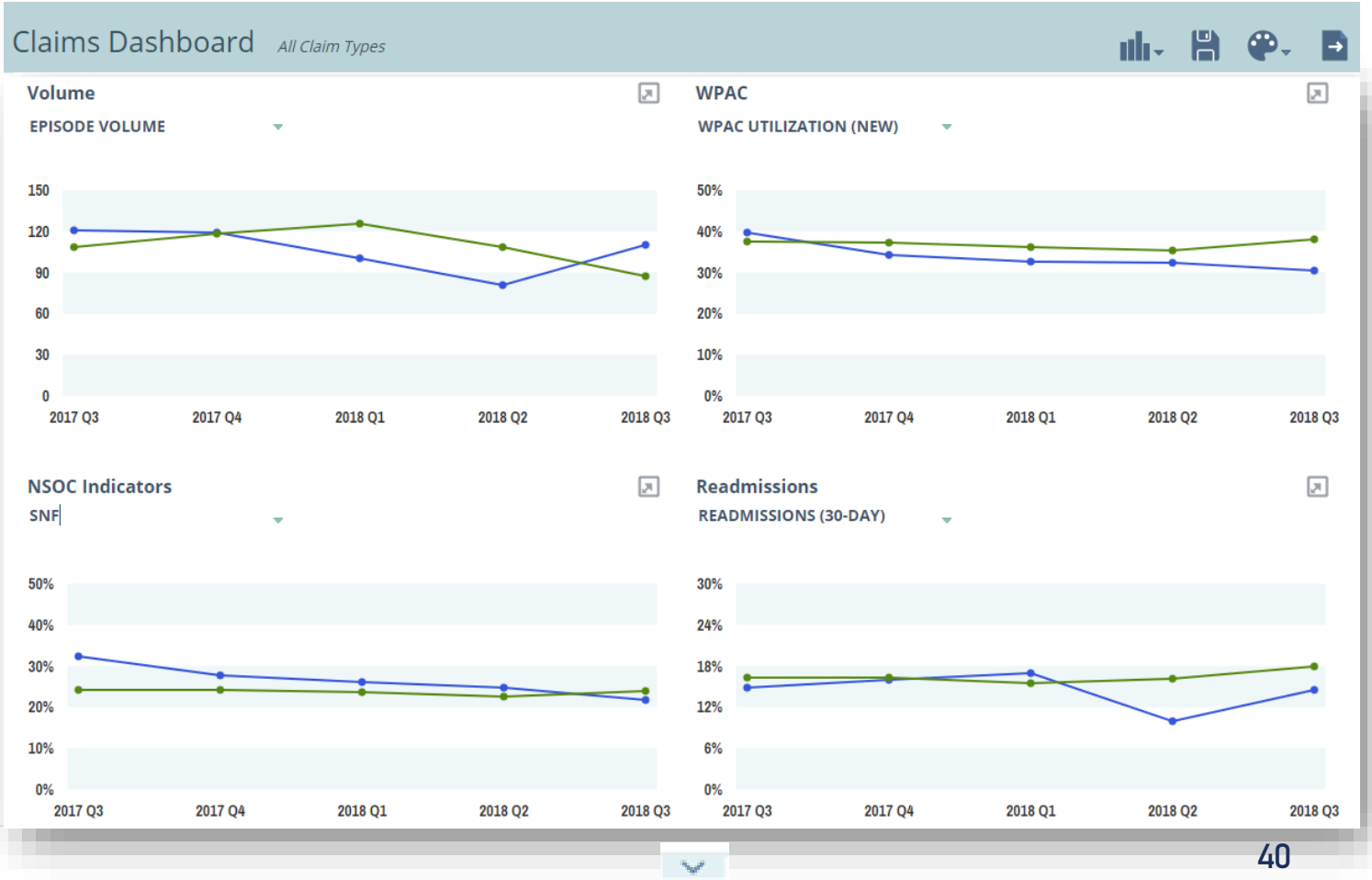
- Claims dashboards trend performance on real-time operational data plus reconciled & unreconciled claims data

Key indicators

- Volume
- wPACU
- NSOC – Home, HH, SNF, etc.
- Readmissions – 7, 30, 60 and 90-day
  NSOC Detail – Readmissions and LOS
- SNF – Total Days, LOS, Per Diem, and Spend
- Cost – Adjusted and Unadjusted

Customizable

- Per trendline on the dashboard
- Display at National, TIN, Region, Division or Site level
- Compare performance against Sound, Region, TIN, Health System



Application of Analytics to Improve Performance

Performance Data in the Hands of Leaders and Physicians

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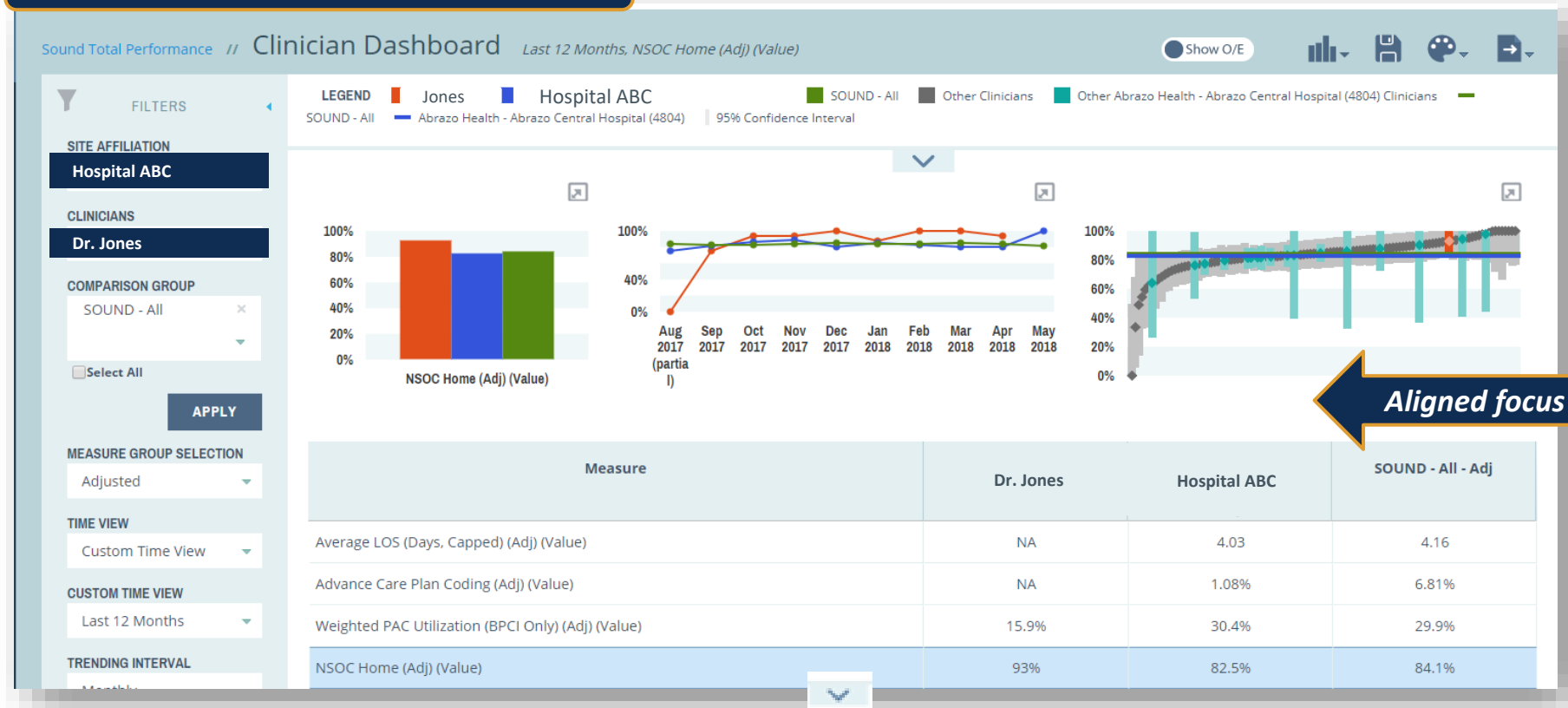
- Aligned focus: Chief view clinicians by top/bottom, across time, rank amongst peers. Clinicians view their specific performance against their site and Sound overall.

Chief - Clinician-level Dashboard



Aligned focus

Clinician-specific Dashboard

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- Measuring the right things
- Driving accountability
- Insights that foster improvement

Application of Analytics to Improve Performance

Driving Accountability

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Core Drivers

Clinical Change Management

Core Drivers of Episode Spending

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- **Hospitalists are uniquely positioned and qualified to impact four major drivers of episode spending:**

Overall Intensity of Care

Appropriate Next Site of Care

Managing SNF Utilization/LOS

Readmission Reduction

Sound Connect™

Driving Performance Outcomes through Peer and Team Comparisons

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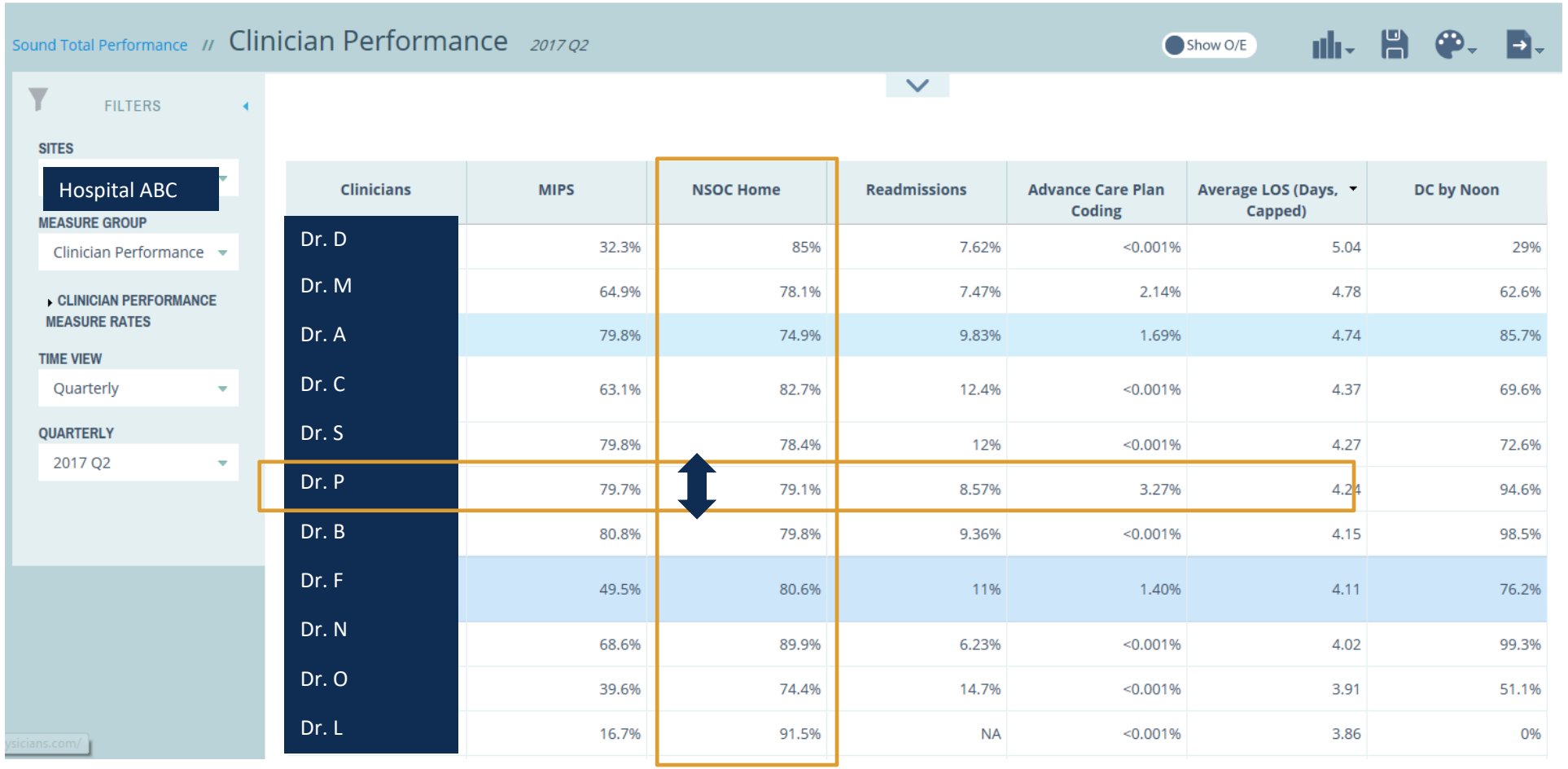

Clinicians	MIPS	NSOC Home	Readmissions	Advance Care Plan Coding	Average LOS (Days, Capped)	DC by Noon
Dr. D	32.3%	85%	7.62%	<0.001%	5.04	29%
Dr. M	64.9%	78.1%	7.47%	2.14%	4.78	62.6%
Dr. A	79.8%	74.9%	9.83%	1.69%	4.74	85.7%
Dr. C	63.1%	82.7%	12.4%	<0.001%	4.37	69.6%
Dr. S	79.8%	78.4%	12%	<0.001%	4.27	72.6%
Dr. P	79.7%	79.1%	8.57%	3.27%	4.24	94.6%
Dr. B	80.8%	79.8%	9.36%	<0.001%	4.15	98.5%
Dr. F	49.5%	80.6%	11%	1.40%	4.11	76.2%
Dr. N	68.6%	89.9%	6.23%	<0.001%	4.02	99.3%
Dr. O	39.6%	74.4%	14.7%	<0.001%	3.91	51.1%
Dr. L	16.7%	91.5%	NA	<0.001%	3.86	0%

- **How am I doing on the Clinical Performance Score (CPS) measures?**

Agenda

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- Measuring the right things
- Driving accountability
- Insights that foster improvement

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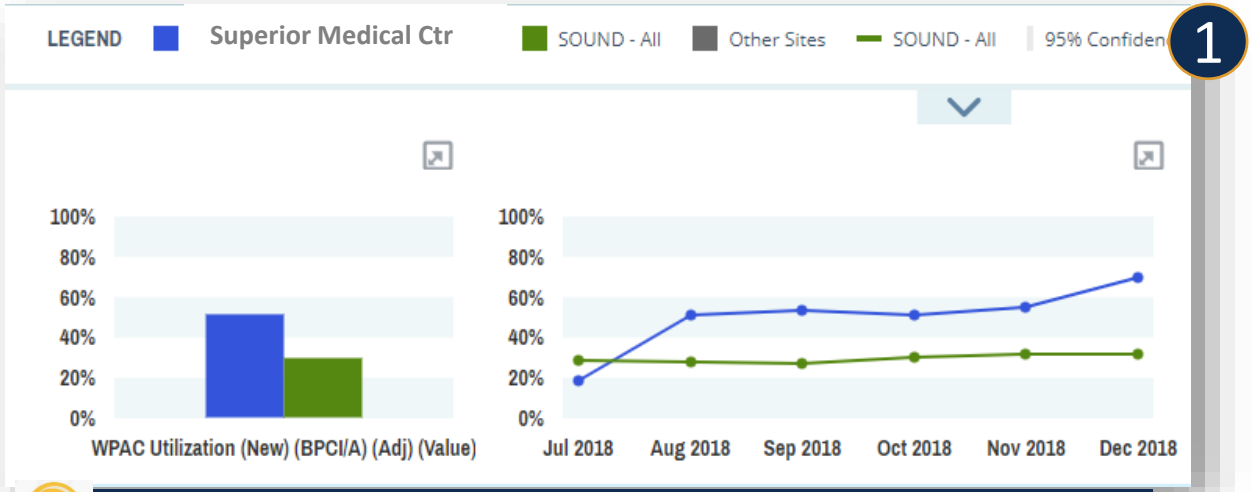
Understanding Variance to Drive Improvement

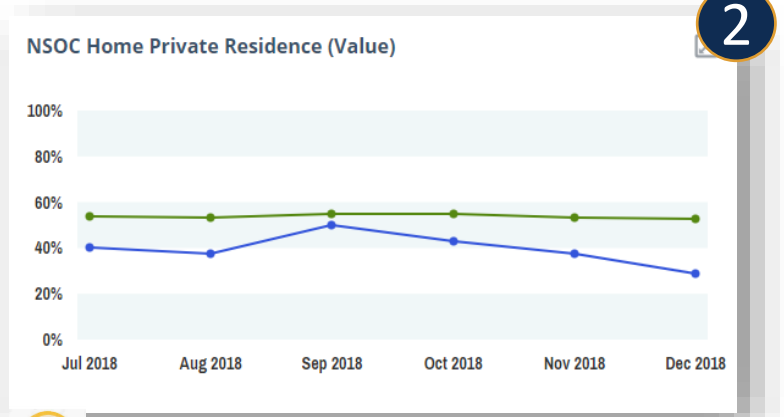
SOUND POPULATION HEALTH

1



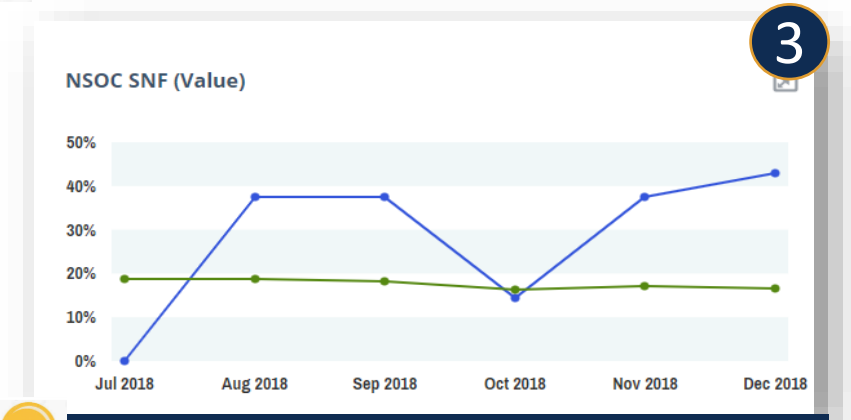
wPACU increase past month, above national all last 5 months.

2



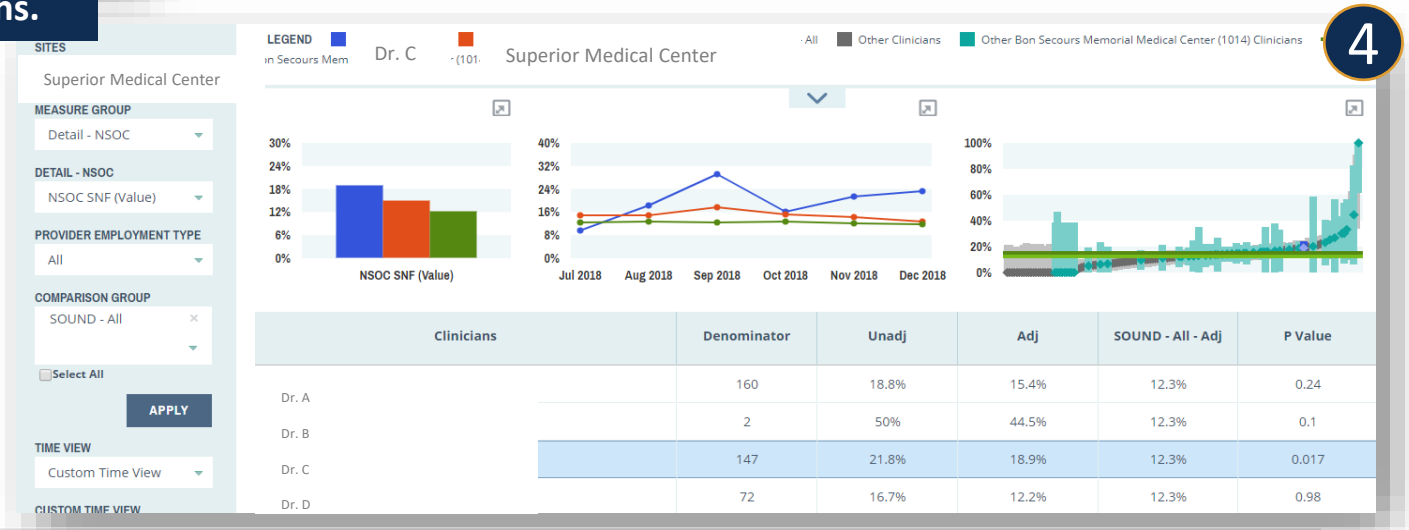
Fewer patients are going home.

3



More patients to skilled nursing facility.

4



Several clinicians with higher % of SNF discharges compared to peers.

Quality | Service | Teamwork | Innovation | Integrity

How do we do it at Sound?

Technology and Analytics

SOUND
POPULATION HEALTH

Physician-led Decision Making

- Strong culture of physician leadership
- Deep engagement of physicians in the “why” of value-based care
- Targeted training, tools in specific interventions

The Right Clinical Interventions

- ED identification and triage
- Early goals of care discussion with patients
- Next site of care planning; PCP follow-up
- Home health 2 week protocol
- SNF Telemedicine

Management Process

- Clinical performance RN drives process
- Repeatable clinical processes embedded in physician, RN workflow
- Feedback, comparative performance at physician level

- Technology and Analytics to Drive Real Time Actions and Accountability

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ArborMetrix
Specify. Measure. Act.