



maryland
health services
cost review commission

Quality Based Reimbursement Redesign Subgroup to the Performance
Measurement Workgroup

May 19, 2021

Agenda

1. SIHIS-aligned measures
 - Follow-up measure
 - Severe maternal morbidity
2. Re-evaluation of existing measures
 - 30-day all-cause mortality
 - THA-TKA Complications
3. QBR Subgroup Next Steps

Topic 1: SIHIS-aligned measures

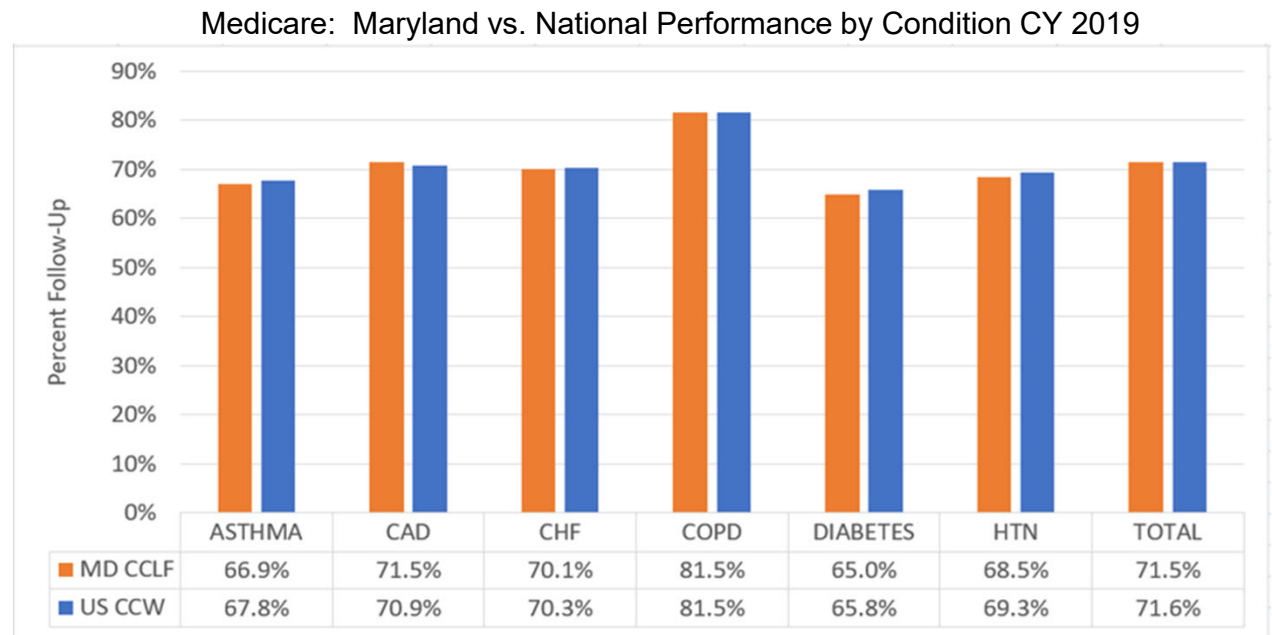
Follow-up after Discharge: Current Status

- Approved in the SIHIS Proposal by CMS on March 17, 2021
- Medicare only measure included in the RY 2023 QBR program, in the Person and Community Engagement (HCAHPS) domain
- Potential to expand the measure to:
 - Additional Payers (Medicaid, Commercial)
 - Additional Chronic Conditions (Behavioral Health)

Timely Follow-up After Acute Exacerbations of Chronic Conditions

- NQF endorsed health plan measure that looks at percentage of ED, observation stays, and inpatient admissions for one of the following six conditions, where a follow-up was received within time frame recommended by clinical practice:
 - Hypertension (7 days)
 - Asthma (14 days)
 - Heart Failure (14 days)
 - CAD (14 days)
 - COPD (30 days)
 - Diabetes (30 days)

| Medicare SIHIS Goal | |
|---------------------|--------|
| Year 3 (2021) | 72.26% |
| Year 5 (2023) | 73.16% |
| Year 8 (2026) | 75.00% |



Follow-up after Discharge: Monitoring Reports

- By-hospital and by-condition updated monthly and posted to the CRS Portal
 - Claims-based, built off of the CCLF - four-month runout
 - Refreshes monthly
- Maryland and National Comparison
 - National numbers using the National 5% sample in the CCW

YTD 2020 (Through November 2020) Follow-Up Rates

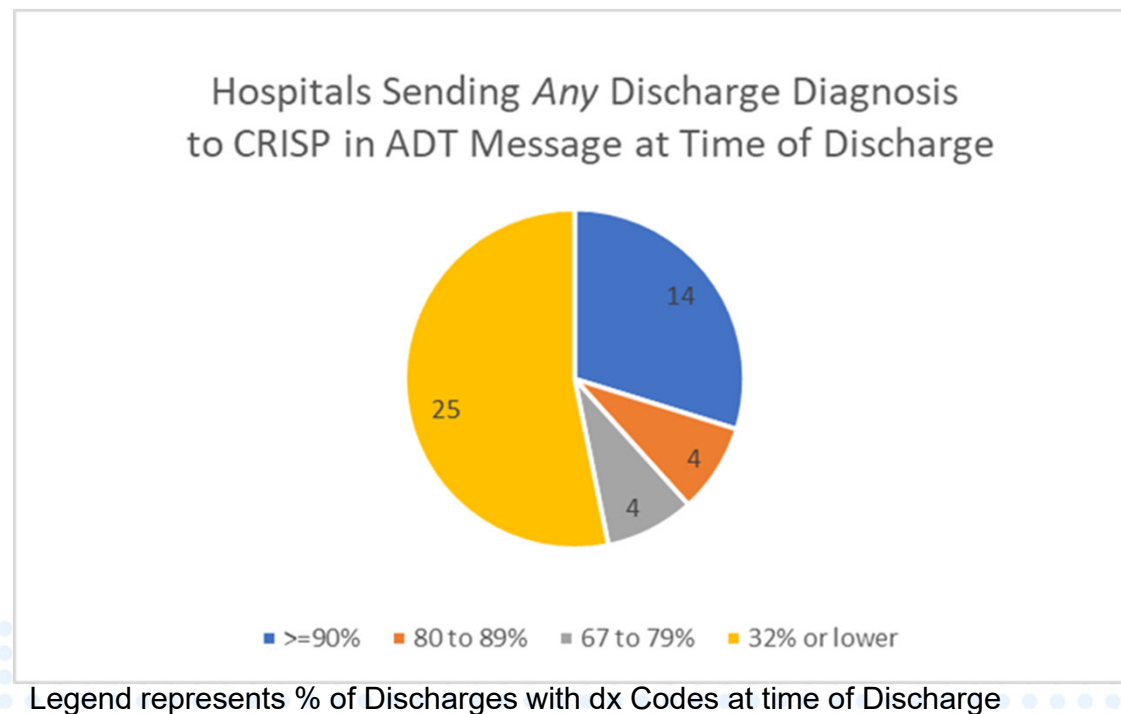
| Hosp ID | Hospital Name | ASTHMA | | | CAD | | | CHF | | | COPD | | | DIABETES | | |
|---------|----------------------|-------------------|-------------------|----------------|-------------------|-------------------|----------------|-------------------|-------------------|----------------|-------------------|-------------------|----------------|-------------------|-------------------|----------------|
| | | Eligible Discharg | Follow-Up Receive | Follow-Up Rate | Eligible Discharg | Follow-Up Receive | Follow-Up Rate | Eligible Discharg | Follow-Up Receive | Follow-Up Rate | Eligible Discharg | Follow-Up Receive | Follow-Up Rate | Eligible Discharg | Follow-Up Receive | Follow-Up Rate |
| 210001 | Meritus | 227 | 161 | 70.93% | 301 | 252 | 83.72% | 496 | 393 | 79.23% | 444 | 363 | 81.76% | 207 | 152 | 73.43% |
| 210002 | UMMC | 99 | 48 | 48.48% | 255 | 152 | 59.61% | 344 | 212 | 61.63% | 149 | 103 | 69.13% | 164 | 93 | 56.71% |
| 210003 | UM-PGHC | 119 | 70 | 58.82% | 198 | 131 | 66.16% | 327 | 204 | 62.39% | 204 | 148 | 72.55% | 108 | 66 | 61.11% |
| 210004 | Holy Cross | 94 | 64 | 68.09% | 187 | 145 | 77.54% | 315 | 236 | 74.92% | 159 | 128 | 80.50% | 149 | 102 | 68.46% |
| 210005 | Frederick | 236 | 177 | 75.00% | 340 | 283 | 83.24% | 605 | 476 | 78.68% | 411 | 357 | 86.86% | 286 | 210 | 73.43% |
| 210006 | UM-Harford | 88 | 51 | 57.95% | 90 | 55 | 61.11% | 201 | 129 | 64.18% | 172 | 137 | 79.65% | 95 | 51 | 53.68% |
| 210008 | Mercy | 50 | 23 | 46.00% | 93 | 48 | 51.61% | 151 | 82 | 54.30% | 93 | 54 | 58.06% | 111 | 54 | 48.65% |
| 210009 | Johns Hopkins | 119 | 70 | 58.82% | 261 | 137 | 52.49% | 493 | 285 | 57.81% | 164 | 119 | 72.56% | 260 | 148 | 56.92% |
| 210011 | St. Agnes | 145 | 73 | 50.34% | 189 | 114 | 60.32% | 471 | 267 | 56.69% | 298 | 198 | 66.44% | 272 | 147 | 54.04% |
| 210012 | Sinai | 170 | 100 | 58.82% | 373 | 248 | 66.49% | 541 | 333 | 61.55% | 289 | 206 | 71.28% | 221 | 125 | 56.56% |
| 210013 | Grace Medical center | | | | | | | | | | | | | | | 42.86% |
| 210015 | MedStar Fr Square | 344 | 197 | 57.27% | 523 | 332 | 63.48% | 951 | 576 | 60.57% | 722 | 517 | 71.61% | 390 | 229 | 58.72% |
| 210016 | Adventist White Oak | 106 | 66 | 62.26% | 242 | 175 | 72.31% | 333 | 238 | 71.47% | 178 | 140 | 78.65% | 125 | 85 | 68.00% |
| 210017 | Garrett | 31 | 20 | 64.52% | 33 | 24 | 72.73% | 68 | 52 | 76.47% | 50 | 39 | 78.00% | 30 | 23 | 76.67% |
| 210018 | MedStar Montgomery | 91 | 63 | 69.23% | 97 | 64 | 65.98% | 233 | 155 | 66.52% | 144 | 117 | 81.25% | 153 | 93 | 60.77% |
| 210019 | Peninsula | 298 | 202 | 67.79% | 308 | 244 | 79.22% | 510 | 367 | 71.96% | 410 | 337 | 82.20% | 272 | 199 | 73.16% |

Follow-up after Discharge: Additional Monitoring Tools

- **Identifying patients using ADT data** – PCP Support staff using real-time (ADT) data to recognize patients who have discharges associated with inpatient, ED or Obs visits for the six chronic conditions to help prioritize outreach and scheduling within suggested time periods.
 - CRISP created a **PROMPT filter** as *initial* sort for outreach and scheduling
 - Can be used by hospitals who are reliably and accurately charting discharge diagnoses (within chronic condition subgroups) and sending to CRISP when patients are discharged (same-day).
- **EHR charting of outreach and scheduling visits within timeframes** (various workflows / future sharing at Learning Collaboratives) – EHR
- **Measuring success using Medicare CCLF data for QBR Timely Follow-up Summary and Detail Reports** (see previous slide)

Follow-up after Discharge: Additional Monitoring Tools

- CRISP performed an analysis of the ADT data to understand which hospitals are sending discharge diagnosis reliably (what % of ADT messages contain discharge diagnosis at discharge or within 24 hours of discharge)
- Also compared ADT data to Case-mix Data to understand the completeness of the diagnosis sent in ADTs





Filter by Name or MRN Test - Solarwinds Timely Follow-up Add Filter

• Timely Follow-up (1 filters)

Smart Alert Rule Type contains Secondary

All Not started In progress Completed

Notifications count: 1699
last updated: 12:11 05/17/21

Anne Arundel Medical Center
Emergency Department
05/13/2021 08:34 PM
ER Discharge
Chest pain, unspecified Chest pain, unspecified

Anne Arundel Medical Center
Emergency Department
05/13/2021 07:14 PM
ER Discharge
Other chest pain Other chest pain

White Oak Medical Center
Hospital
05/13/2021 05:30 PM
IP Discharge
Unstable Angina Non-ST elevation (NSTEMI) myocardial infarction

Anne Arundel Medical Center
Emergency Department
05/13/2021 04:01 PM
ER Discharge
Lumbago with sciatica, right side Lumbago with sciatica, right side

Patient Name **MRN**

DEMOGRAPHICS

| | |
|-------------------------------------|---------------------|
| Primary Care Provider: | MRN: |
| Gender: F | Date of Birth: |
| Facility Type: Emergency Department | Address: |
| City: ANNAPOLIS | State: MD |
| Home Phone: | ZipCode: 21403-4412 |
| Work Phone: | Cell Phone: |
| PCP Phone: | Email: |
| Care Manager Phone: | Care Manager Name: |
| Care Manager Email: | |

MOST RECENT EVENT

| | |
|---|--|
| Hospital Service: ER | Event Date/Time: 05/13/2021 08:34 pm |
| Discharge to Location: Home | Patient Complaint: Chest pain, unspecified |
| Point of Care: Anne Arundel Medical Center | Patient Class: Emergency |
| Admit Source: HOS | Event Type: Discharge |
| Admit Date/Time: 05/13/2021 06:28 pm | Discharge Disposition: Home (Self Care) |
| Diagnosis Description: Chest pain, unspecified | Diagnosis Code: R07.9 |
| Discharge Date/Time: 05/13/2021 08:33 pm | Observation Status: N |
| Smart Alert Rule Type: Timely Follow Up on Chronic Conditions - Death Indicator: No | |
| Primary+Secondary | Attending Provider Name: PATRICIA GREY |
| Attending Provider ID: 1497147359 | Admitting Provider Name: |
| Referring Provider Name: | Admitting Provider ID: |
| Referring Provider ID: | Consulting Provider Name: |
| Patient Identified Provider Name: COURTNEY MILNE-KROHN | Consulting Provider ID: |
| Patient Identified Provider ID: 1588823611 | |

ADDITIONAL INFO

| | |
|------------------------|-------------------------------------|
| Number of IP Visits: 0 | Destination Practice: |
| Race: Caucasian/White | Ethnicity: Non-Hispanic |
| Group: | Insurance: |
| | ENS Start date: 05/14/2021 12:34 am |

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Follow-up After Discharge: Additional Monitoring Tools

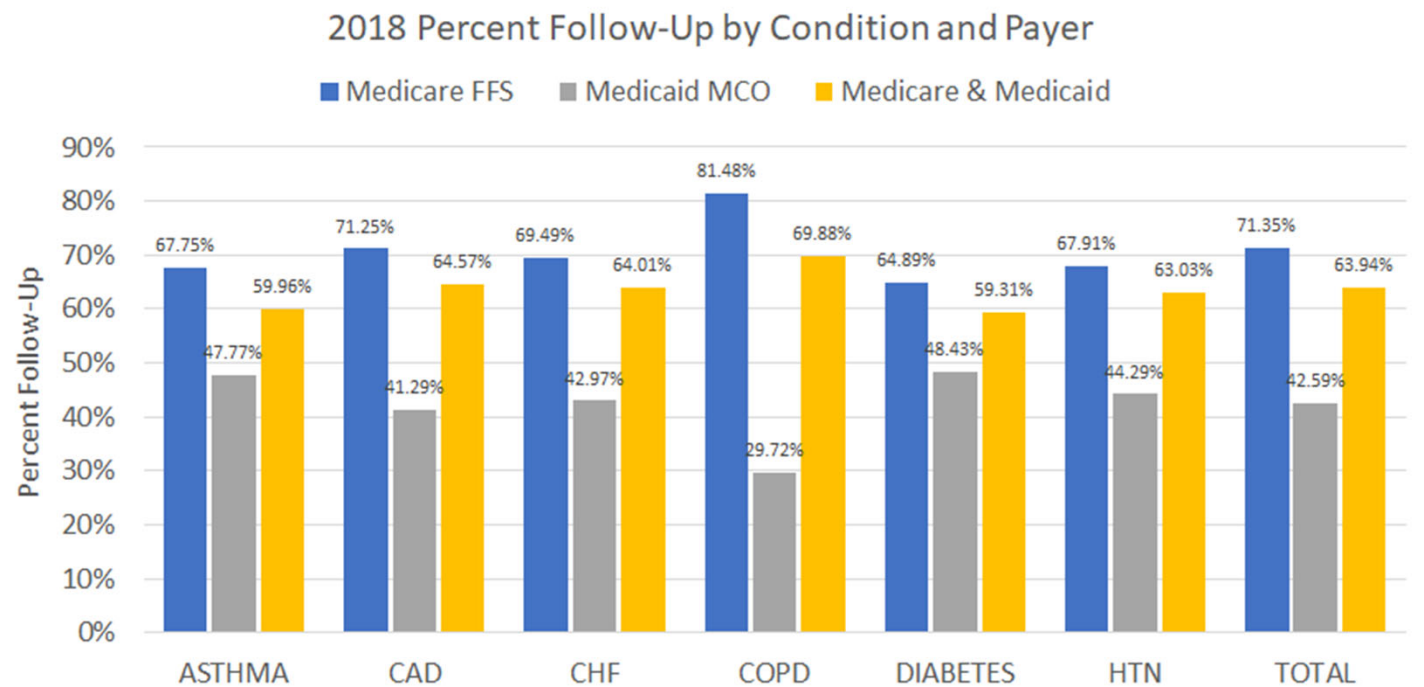
Add Timely Follow-up for Medicaid Beneficiaries

- HSCRC and Medicaid are interested in expanding the follow-up measure to include members of Medicaid Managed Care Organizations (MCOs)
- Exploring data use agreements to have CRISP run Medicaid MCO reports
- Given Medicare FFS goal for SIHIS, need to assess option and impact of having a multi-payer measure in pay-for-performance program
 - Similar concern was raised with having a Medicare readmission goal under APM and an all-payer readmission program;
 - CMMI has indicated that all-payer measures are desired whenever feasible.

Medicare and Medicaid Follow-Up Rates

Medicare enrollees make up majority of admissions for each of the six chronic conditions; analysis shows there is a significant disparity between Medicare and Medicaid follow-up to be addressed

| Chronic Condition | Eligible Discharge | Percent Medicare |
|-------------------|--------------------|------------------|
| ASTHMA | 12,595 | 61% |
| CAD | 14,063 | 78% |
| CHF | 25,635 | 79% |
| COPD | 18,222 | 78% |
| DIABETES | 13,557 | 66% |
| HTN | 6,749 | 79% |
| TOTAL | 90,821 | 74% |



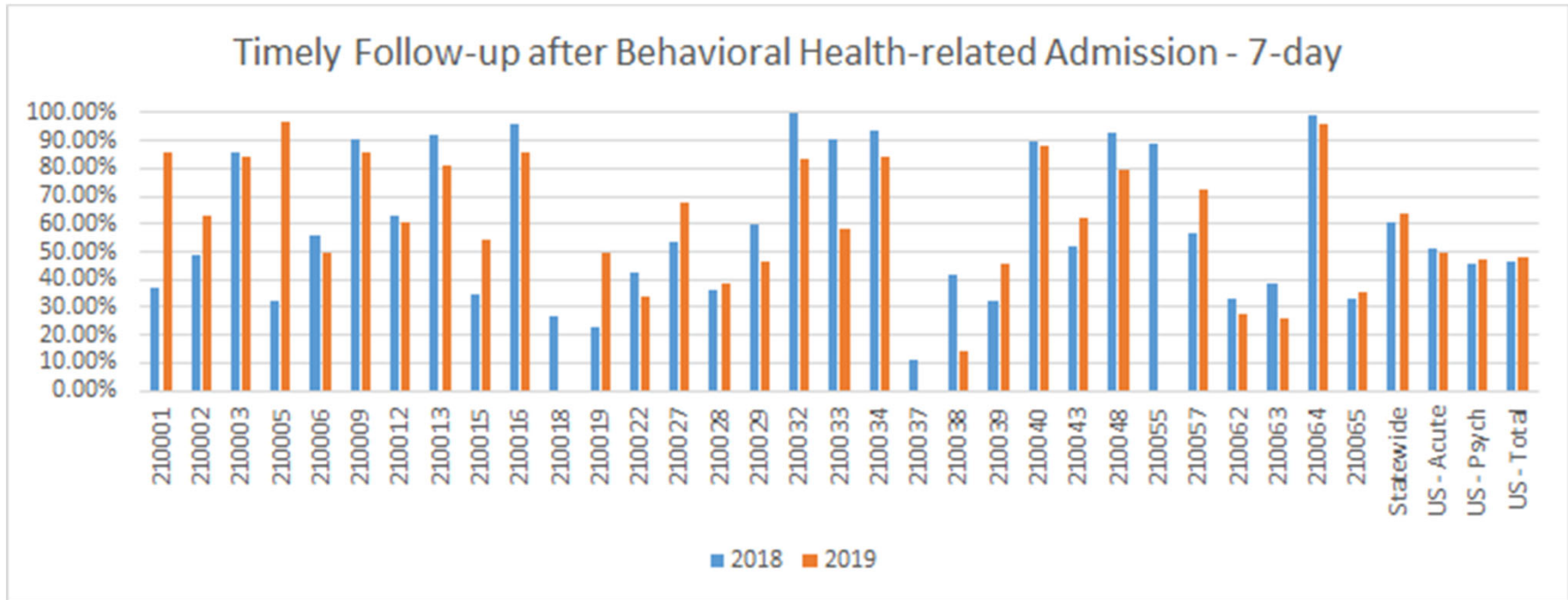
Other (Commercial) Payers?

- HSCRC interested in building out a multi-payer measure of follow-up that includes commercial payers, but without access to non-hospital claims data at a patient level it would be for monitoring only
- **Monitoring Options:**
 - MHCC's Medical Claims Database (former APCD) may be able to be used but with significant time lag
 - Provide SAS code and aggregate table shells for payers to populate
- If subgroup believes this is worth exploring, HSCRC will convene a meeting with commercial payers to discuss options
 - Consider potential size for non-Medicare

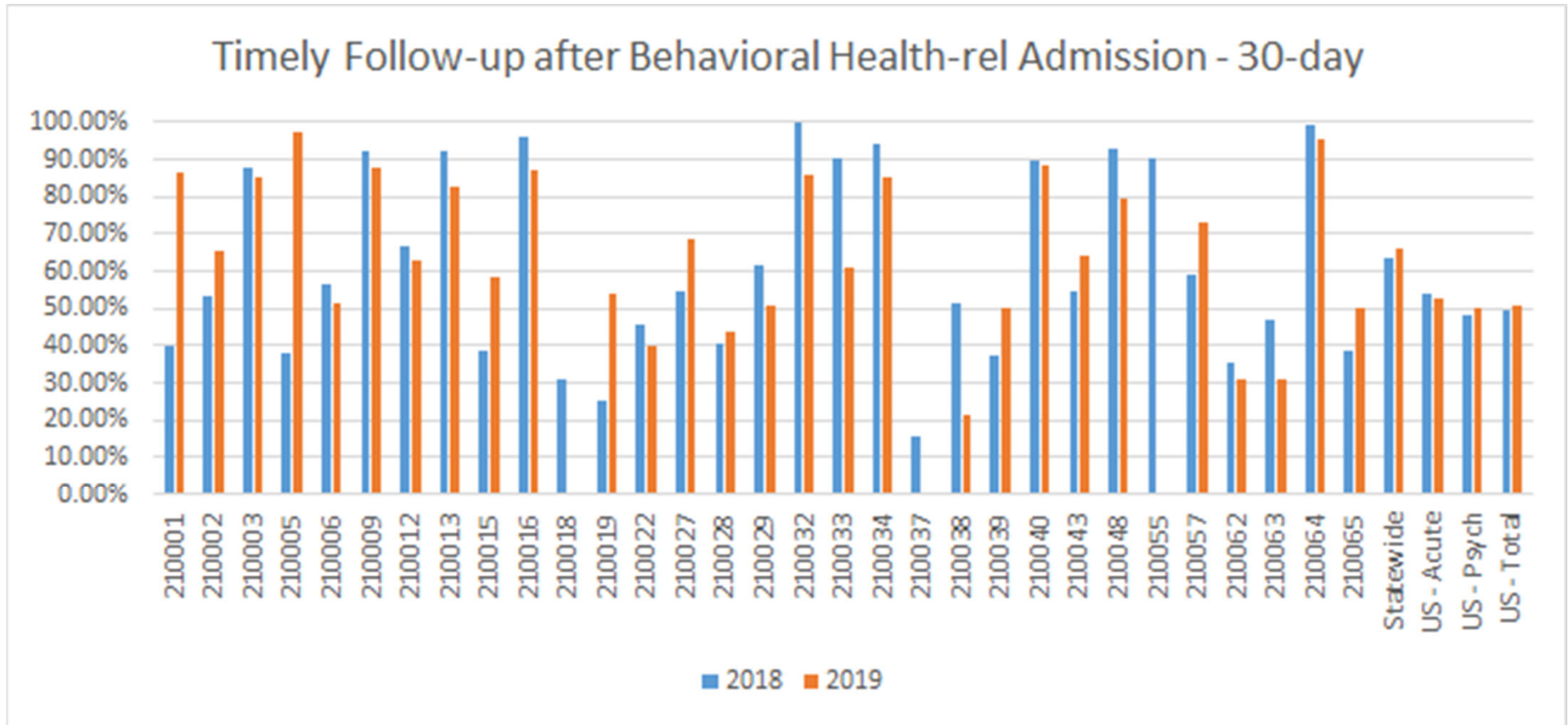
Potential to add Timely Follow-up Behavioral Health Hospitalization

- Modeled after HEDIS Timely Follow-up Measures - see below:
 - Follow-Up After Hospitalization for Mental Illness
 - HEDIS measure that identifies the percentage of members who received follow-up within 7 days and 30 days of discharge.
 - Assesses adults and children 6 years of age and older who were hospitalized for treatment of selected mental illness or intentional self-harm and had an outpatient visit, an intensive outpatient encounter or a partial hospitalization with a mental health practitioner.
- Potential Challenges:
 - 42 CFR Data Suppression
 - MD versus National (5% sample):
 - The measure produces a sizeable gap between MD performance (~65%) versus US (~50%)
 - A small part of this appears to be due to acute hospitals performing better than inpatient psych hospitals and a high percentage of non-MD psych visits are in inpatient psych hospitals
 - Case level data cannot be shared with hospitals since data source is CCW

Timely Follow-up by Hospital, 7-day (Medicare FFS)



Timely Follow-up by Hospital, 30-day (Medicare FFS)



Discussion on Follow-Up Measure in QBR

- Given importance of follow-up after discharge, the QBR program should:
 - Add Medicaid to the pay for performance measure
 - Develop way to monitor Commercial follow-up
 - Add follow-up after hospitalization for mental health
- Looking for subgroup feedback on which if any of these options the HSCRC staff should pursue and the additional data analytics required to make a decision

Severe Maternal Morbidity (SMM)

- At May Commission meeting, \$8 million annually approved for supporting Medicaid and MCO maternal and child health initiatives
- AIM Bundles in the Perinatal Quality Collaborative (HQP)
- Ongoing MCH Taskforce; MCH Strategic Plan to improve Maternal Health
- MD-MOM (HRSA grant to JHH, UMBC, MPSC, and others)

HSCRC Quality - intention to provide data for MD birthing hospitals beginning CY 2022 for monitoring purposes; not intended to include in QBR pay-for-performance

Future SIHIS Alignment

- State Health Improvement is a Statewide goal, across all facets of the healthcare delivery spectrum
- At present, HSCRC will add monitoring reports to the CRS Portal as topical data become available
- Some topical measures that the HSCRC is looking at, for potential **monitoring reports:**
 - Safe Opioid Use eCQM (newly required in CY 2021)
 - Severe Maternal Morbidity (SMM)
 - Other chronic condition measures as available

Topic 2: Re-evaluation of Existing Measures - 30-day Mortality and All-Payer THA-TKA

30-Day Mortality: Presentation of Analytic Findings

May 19, 2021

Overview

- **Goal: develop a 30-day all cause, all payer mortality measure**
 - Capture deaths that occur within 30 days of hospital admission, regardless of where death occurs
- **Use CMS 30-Day Hospital-Wide Claims-based Mortality Measure as a guide**
 - Developed by CMS and Yale/CORE
 - Claims-based version not implemented, but Hybrid version included in IPPS proposed rule
 - Make necessary adjustments to estimate model on Maryland all-payer data
- **Use Maryland Vital Statistics death data merged with Maryland inpatient records**
 - CY 2018 and CY 2019 data
- **Today's agenda:**
 - Present overview of measure design and key steps
 - Review analytic results
 - Facilitate group discussion and feedback



Analytic sample construction

Prior Decision Points

- **Apply “80 percent” rule?**
 - Inpatient measure limited to APR-DRGs that contribute to top 80% of inpatient deaths
 - Applying a similar logic in 30-day measure generated low case counts for some service lines
 - Decision: Do not apply the 80 percent rule for the 30-day measure
- **Maternity service line – include or exclude?**
 - CMS/Yale service line algorithm classified maternity stays inconsistently
 - Some cases assigned to “Surgical – Other” service line, and others were dropped altogether
 - Very low number of 30-day deaths among maternity cases
 - Decision: implement approach to define a new maternity service line, and retain those stays (see further discussion later)
- **Hospice definition (for exclusion flag)**
 - Previously defined based on in-hospital utilization of hospice services
 - Now expanded to also reflect patients that are discharged to hospice setting (via patient disposition codes)

Step 1: Apply inclusion/exclusion criteria

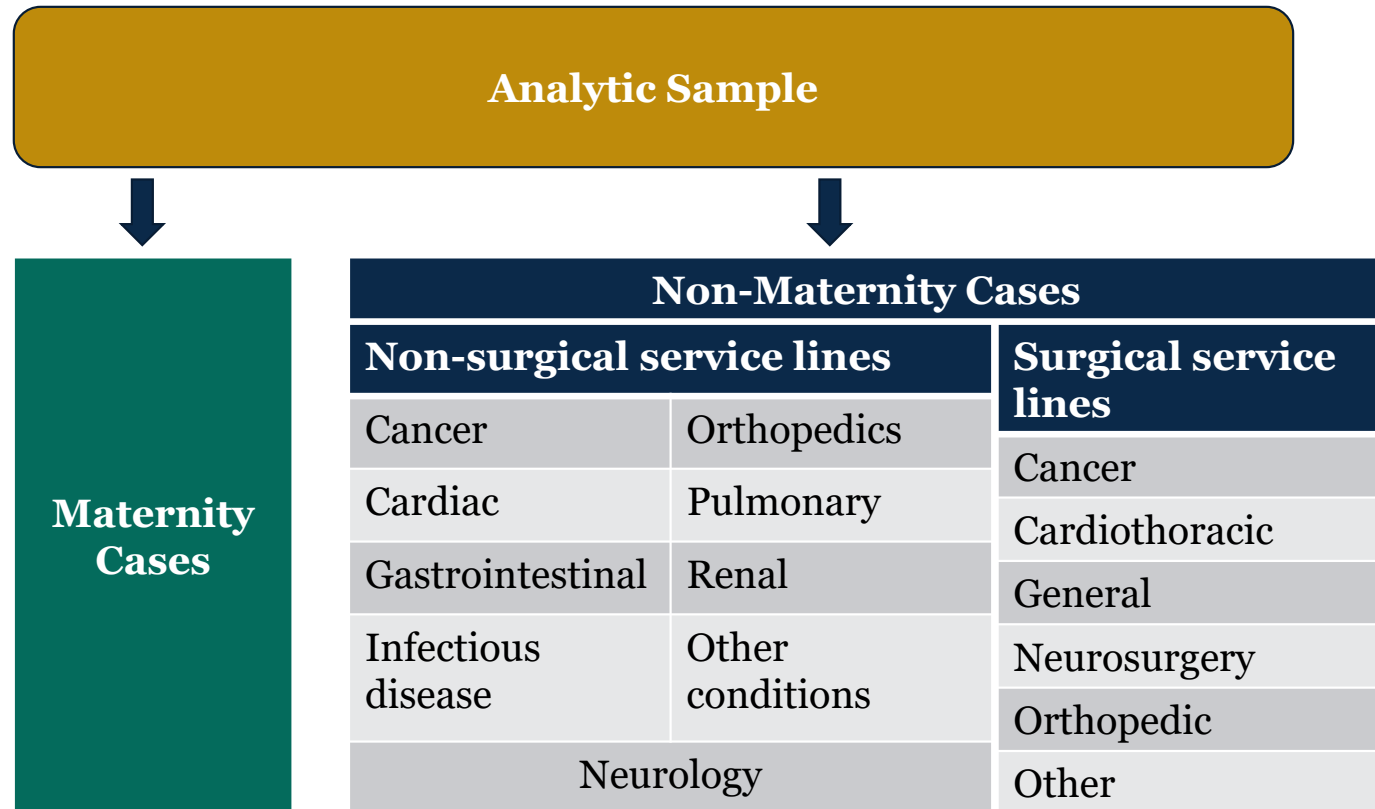
| Cases Excluded from Sample | |
|--|---|
| Transferred in from another acute care facility | Inconsistent vital status (e.g. death date precedes admission date) |
| Enrolled in hospice during index admission | Left against medical advice |
| | Age >95 years |
| Metastatic cancer | Crush, spinal, brain, or burn injury |
| Limited ability for survival (based on ICD-10 codes) | Non-Maryland resident (Vital Statistics data not reliable for non-Maryland residents) |

- For patients with multiple admissions that qualify for measure inclusion, randomly select one admission for inclusion in sample
- Based on PMWG feedback, we conducted additional analyses on the exclusion criteria highlighted in red



Step 2: Assign stays to a service line

- **First, identify maternity stays and assign them to maternity service line**
 - APR-DRG = 540 or 560
- **Next, among non-maternity stays, determine if a major surgical procedure was performed**
 - If yes, then assign stay to the “surgical” cohort; if no, then assign stay to the “non-surgical” cohort
- **Last, assign stays to a service line within non-surgical and surgical cohorts**
 - Non-surgical cohort: assignment based on principle diagnosis
 - Surgical cohort: assignment based on principle procedure



Calculating risk-adjusted rates

Risk adjustment variables and models

- **Adjust for age, APR-DRG category and Risk of Mortality (ROM)**
 - Outcome: 0/1 indicator for whether patient died within 30-days of index admission date
 - Use APR-DRG categories and ROM values present on the index stay
 - Adjust for age and quadratic of age
- **Estimate models within each service line**
 - Allows for association between risk adjustment variables and outcome to vary by type of case
- **All models estimated using logistic regression**



Producing hospital-level rates

- **For each hospital, calculate the expected number of 30-day deaths**
 - Within each service-line, calculate sum of predicted (expected) 30-day deaths for the hospital
 - These are the number of 30-days that are expected for that service line, given the hospital's mix of patients
- **Calculate service line-specific observed to expected (O/E) ratios**
 - By hospital, calculate ratio of observed number of 30-day deaths to expected number of 30-day deaths for each service line
- **Create aggregate O/E ratios for each hospital**
 - Calculate weighted average of O/E ratios across service lines
 - Hospital-specific weights = proportion of overall case volume represented by a service line
- **Multiply hospital's aggregate O/E ratio by state average 30-day mortality rate**
 - Risk-standardized mortality rate (RSMR)



Results: Analytic sample construction

Distribution of stays by exclusion criteria (CY 2019)

| Initial Sample | Dropped Cases | Resulting Sample |
|---|----------------|------------------|
| 635,918 | | |
| Exclusion Criteria | 109,589 | 526,329 |
| <i>Transferred in from another facility</i> | 11,550 | |
| <i>Age > 95</i> | 4,419 | |
| <i>Hospice enrollment at time of admission, or discharge to hospice setting</i> | 14,082 | |
| <i>Metastatic cancer</i> | 34,741 | |
| <i>Limited ability to affect survival</i> | 413 | |
| <i>Inconsistent vital status</i> | 4 | |
| <i>AMA</i> | 9,851 | |
| <i>Crush, spinal, brain, or burn injury</i> | 4,435 | |
| <i>Non-Maryland resident</i> | 42,442 | |
| Random Multiple Admission Exclusion | 215,793 | 310,536 |
| Additional Dropped Cases | 28,228 | 282,308 |
| <i>No service line assigned</i> | 24,969 | |
| <i>APR-DRG cell size < 20</i> | 3,248 | |
| <i>Missing Risk of Mortality</i> | 11 | |
| Final Sample for Model | | 282,308 |

Out-of-state exclusion – additional analyses

- **Two questions related to applying this exclusion:**

- What is the impact on hospital measure performance, especially for hospitals with larger proportions of out-of-state patients?
- Does removing out-of-state patients introduce bias into measure?
 - Bias could result if in-state and out-of-state patients have systematically different risk of mortality

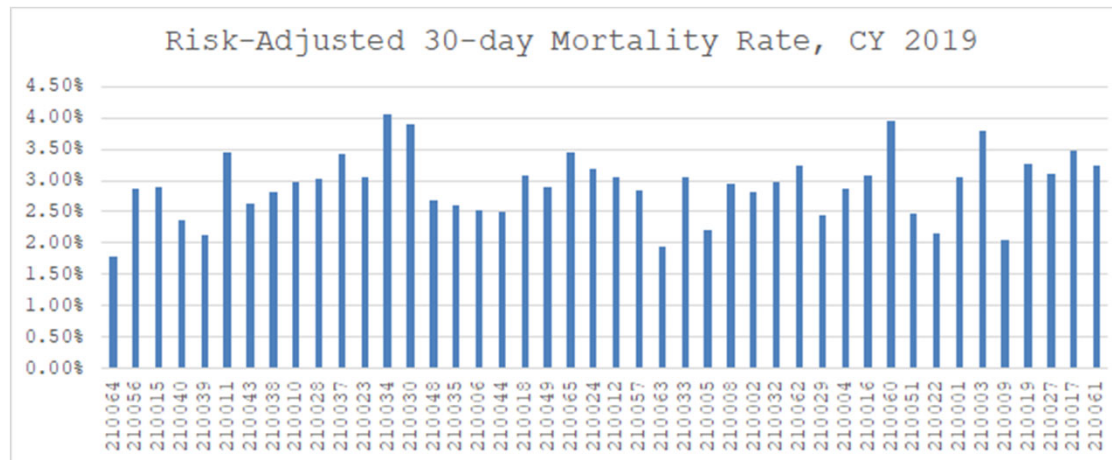
- **Additional analyses**

- Re-estimate model and hospital results with out-of-state exclusion removed (i.e. retain out-of-state patients) and then compare hospital-level performance to results when exclusion is applied
- Using inpatient measure data, assess relative difference in results across in-state and out-of-state patients



Hospital Risk-Standardized Mortality Rates by Out-of State Patients

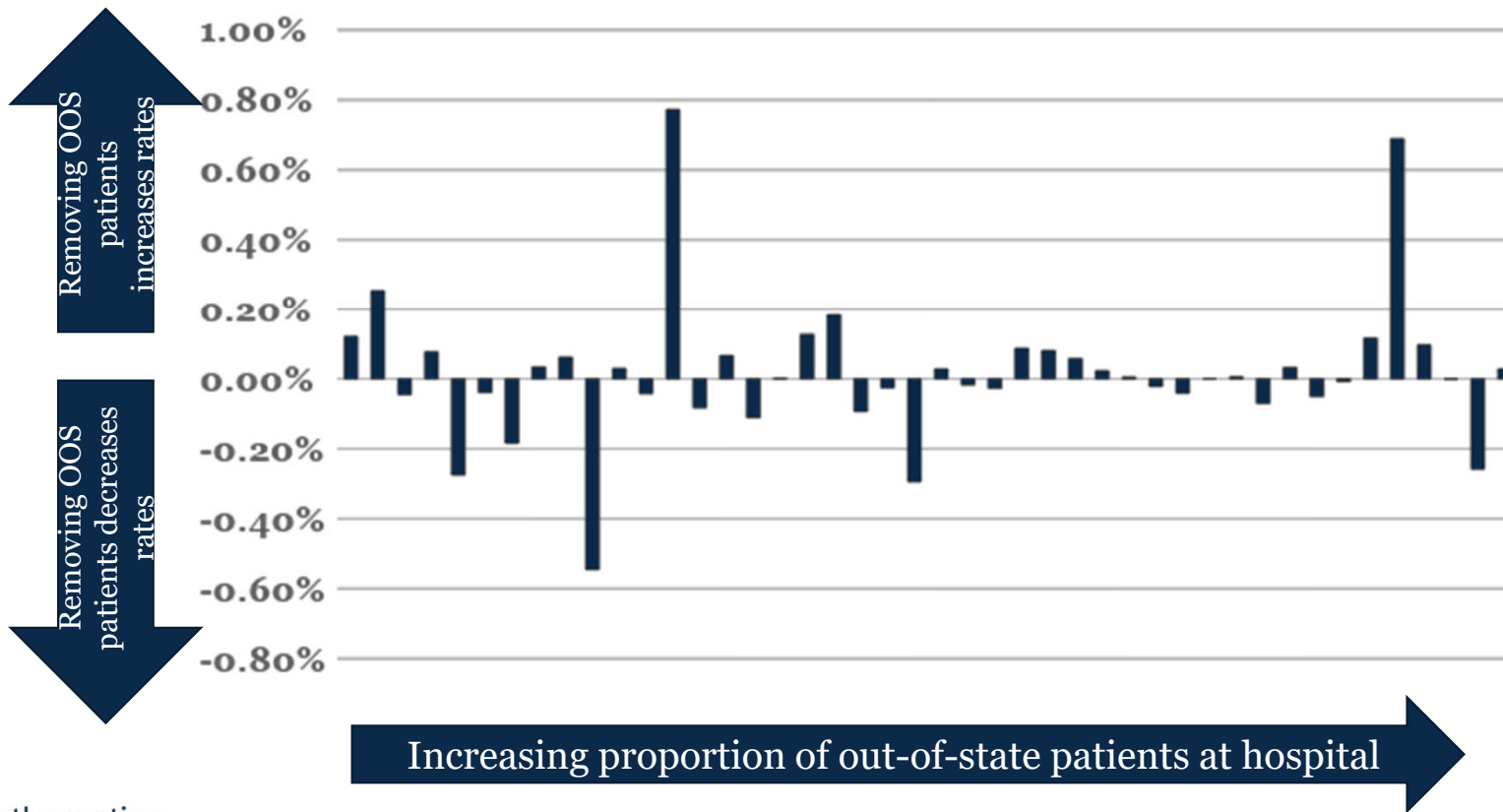
Border hospital or others with higher proportion of out of state residents do not appear to have differential mortality rates



Increasing proportion of out-of-state patients at hospital 

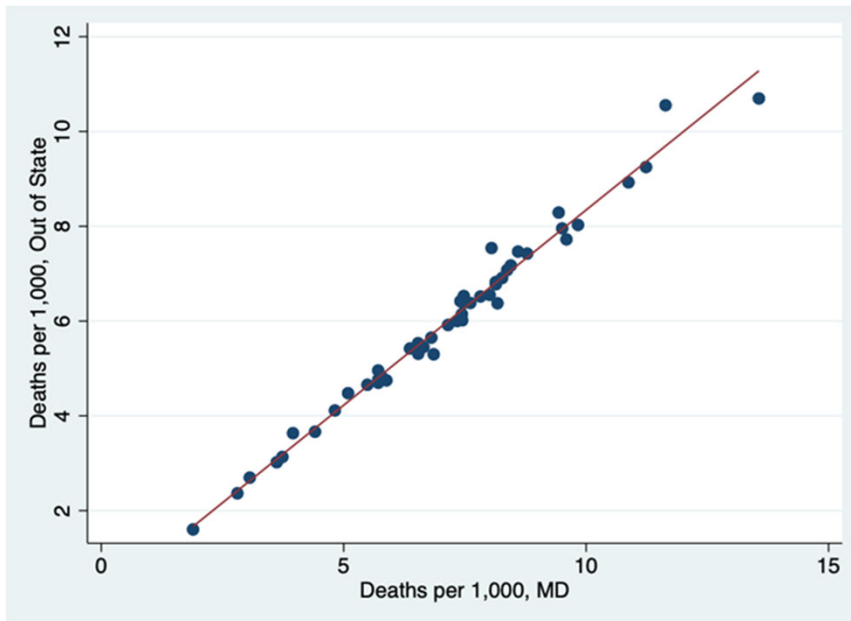
Out-of-state exclusion – impact on RSMR

Change in Risk-Adjusted 30-day Mortality Rate



Out-of-state exclusion – assessment of risk

- **HSCRC evaluated whether IP mortality is similar for in/out-of-state patients using random effects model that adjusted for SOI, ADI, age, sex, race**
 - If similar rates then restricting measure to in-state residents will not produce bias



- Correlation at hospital level is 0.99
- In-state mortality rate is an acceptable proxy for out-of-state rate
- Limiting 30-day mortality measure to in-state patients is appropriate

Hospice – additional analysis

- **Inpatient all-payer data does not capture post-discharge enrollment in hospice care**
- **Possible that some patients are discharged from hospital and subsequently enroll in hospice**
- **Use Medicare FFS data to assess how often this scenario occurs**
 - Can observe hospice utilization outside of inpatient setting



Percent of patients that enroll in hospice post-discharge

| Patient Disposition* | Percent enrolled in hospice within 30 days of discharge | |
|---|---|-----------|
| | <u>Maryland</u> | <u>US</u> |
| Home | 1.6 | 1.3 |
| SNF | 5.4 | 6.7 |
| Home health | 3.2 | 3.2 |
| Rehab | 2.2 | 2.4 |
| Hospice - facility | 90.3 | 88.1 |
| Other short-term hospital | 5.1 | 6.6 |
| Hospice - home | 86.3 | 80.8 |
| * Dispositions listed account for 98% of all stays. | | |

Distribution of stays by service line (CY 2019)

| Non-Surgical | # of Stays | # of Deaths | Unadjusted Mortality Rate |
|--|----------------|--------------|---------------------------|
| Cancer | 1,349 | 72 | 5.34% |
| Cardiac | 17,246 | 497 | 2.88% |
| Gastrointestinal | 18,164 | 254 | 1.40% |
| Infectious Disease | 29,275 | 1835 | 6.27% |
| Neurology | 12,639 | 480 | 3.80% |
| Orthopedics | 5,711 | 104 | 1.82% |
| Pulmonary | 22,781 | 790 | 3.47% |
| Renal | 17,277 | 515 | 2.98% |
| Other Conditions | 32,745 | 641 | 1.96% |
| Subtotal | 157,187 | 5,188 | 3.30% |
| | | | |
| Surgical | # of Stays | # of Deaths | Unadjusted Mortality Rate |
| Cancer | 3,408 | 24 | 0.70% |
| Cardiothoracic | 4,154 | 152 | 3.66% |
| General | 15,397 | 212 | 1.38% |
| Neurosurgery | 1,542 | 90 | 5.84% |
| Orthopedic | 30,572 | 192 | 0.63% |
| Other | 11,242 | 161 | 1.43% |
| Subtotal | 66,315 | 831 | 1.25% |
| | | | |
| Surgical and Non-Surgical Total | 223,502 | 6,019 | 2.69% |
| | | | |
| Maternity | # of Stays | # of Deaths | Unadjusted Mortality Rate |
| | 58,806 | 5 | 0.01% |



Results: Calculating risk-adjusted rates

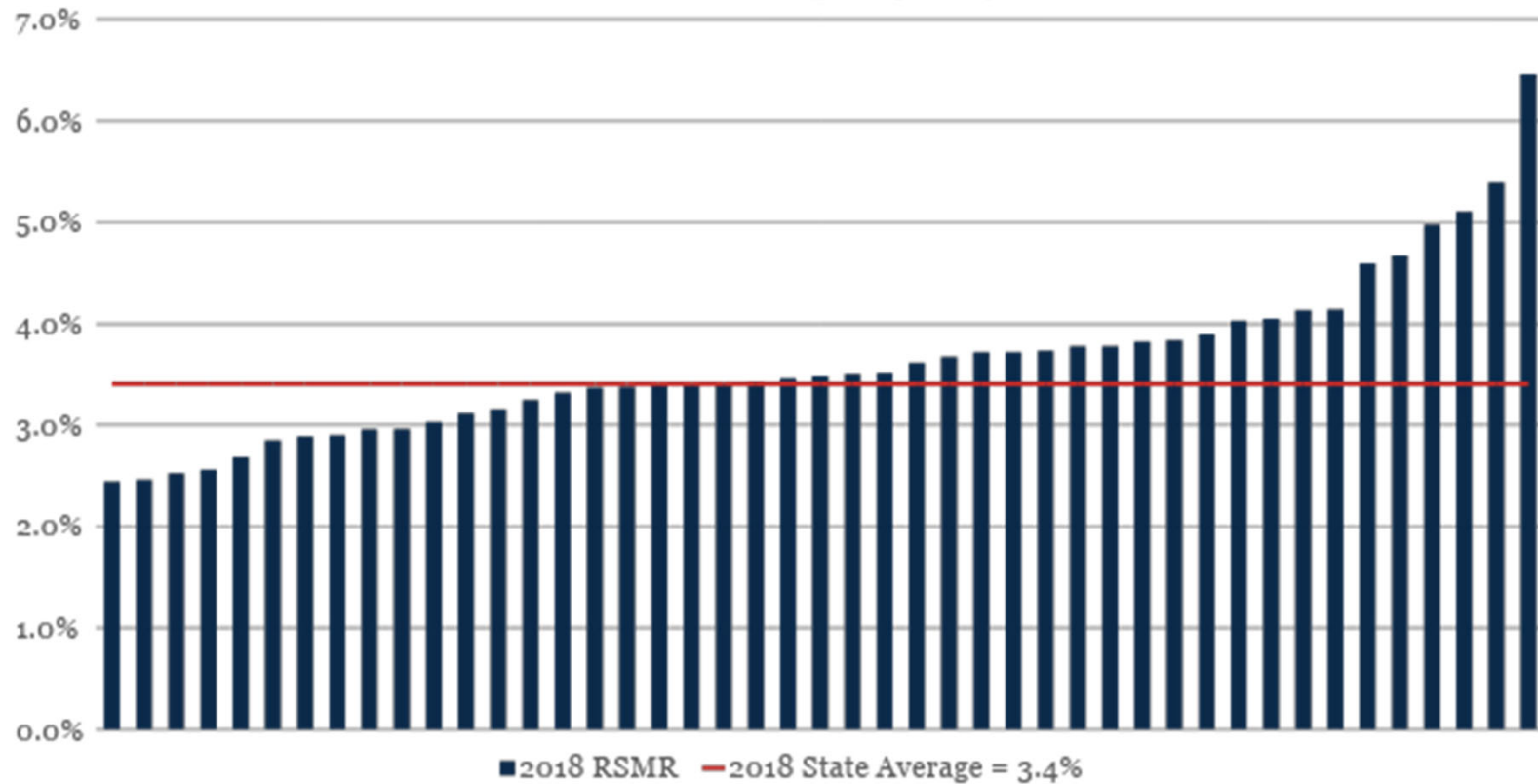
Maternity service line excluded from rate calculation

- **After maternity service line was developed, ran measure logic and risk adjustment models with maternity cases included**
- **Found that inclusion of maternity service line yielded unstable measure results and outlier hospital performance**
 - Very rare outcome = very low number of expected deaths derived from risk-adjustment model
 - O/E ratios within service line are sensitive to observed (actual) 30-day deaths
 - Maternity service line is relatively high-volume, which means O/E carries greater weight in hospital RSMR
- **Recommendation: continue with implementation of maternity service but exclude from RSMR calculation.**
 - Continue to track mortality numbers descriptively for maternity cases

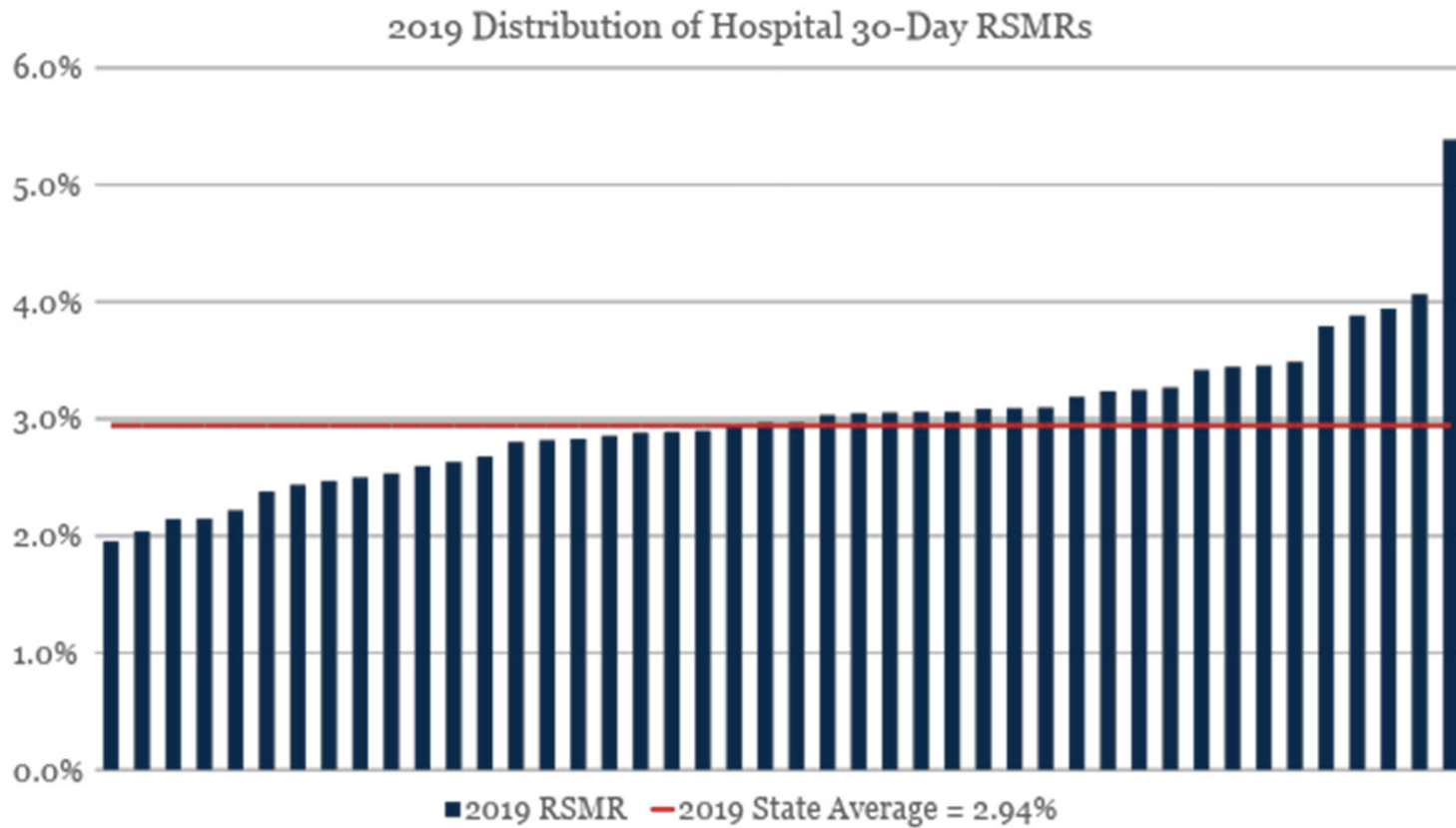


Distribution of 30-day Mortality results

2018 Distribution of Hospital 30-Day RSMRs

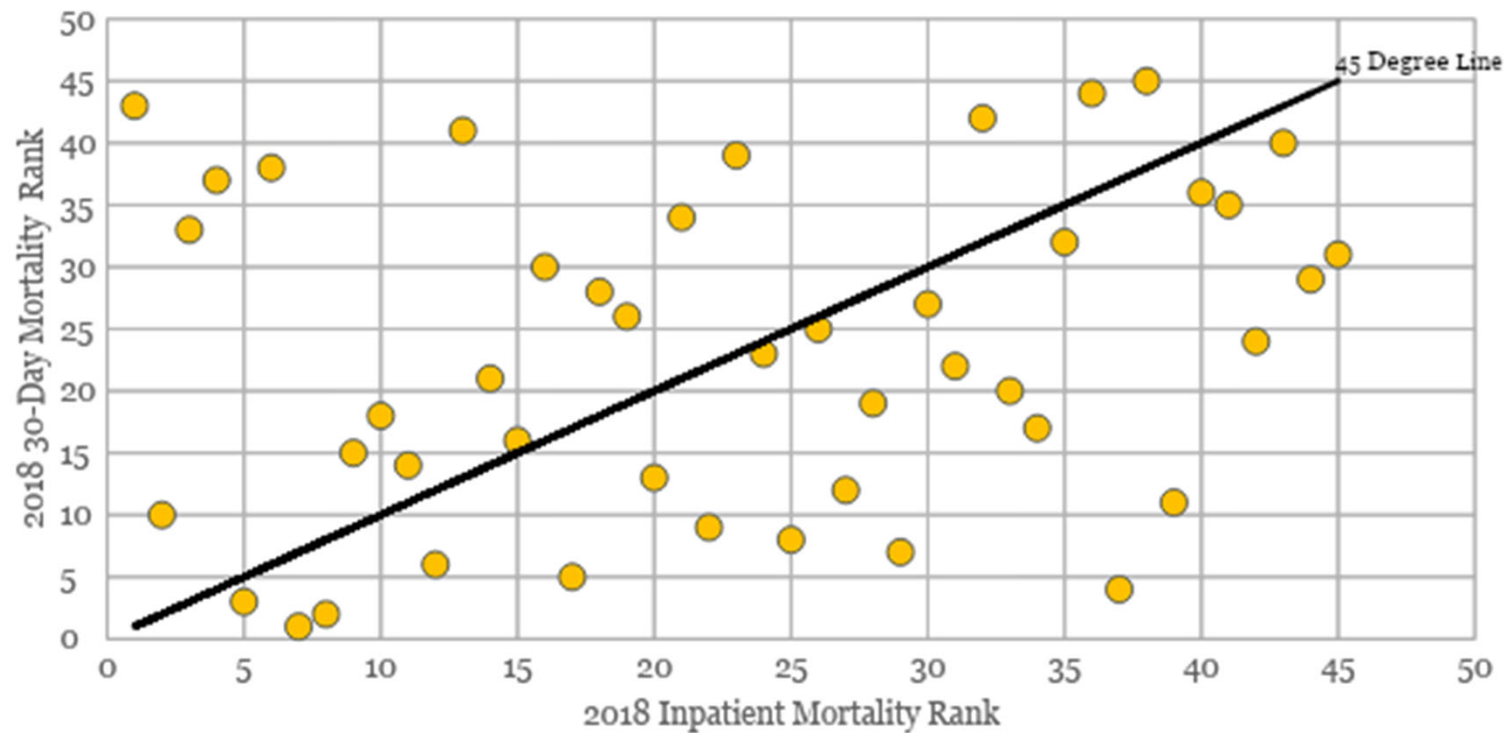


Distribution of 30-day Mortality results



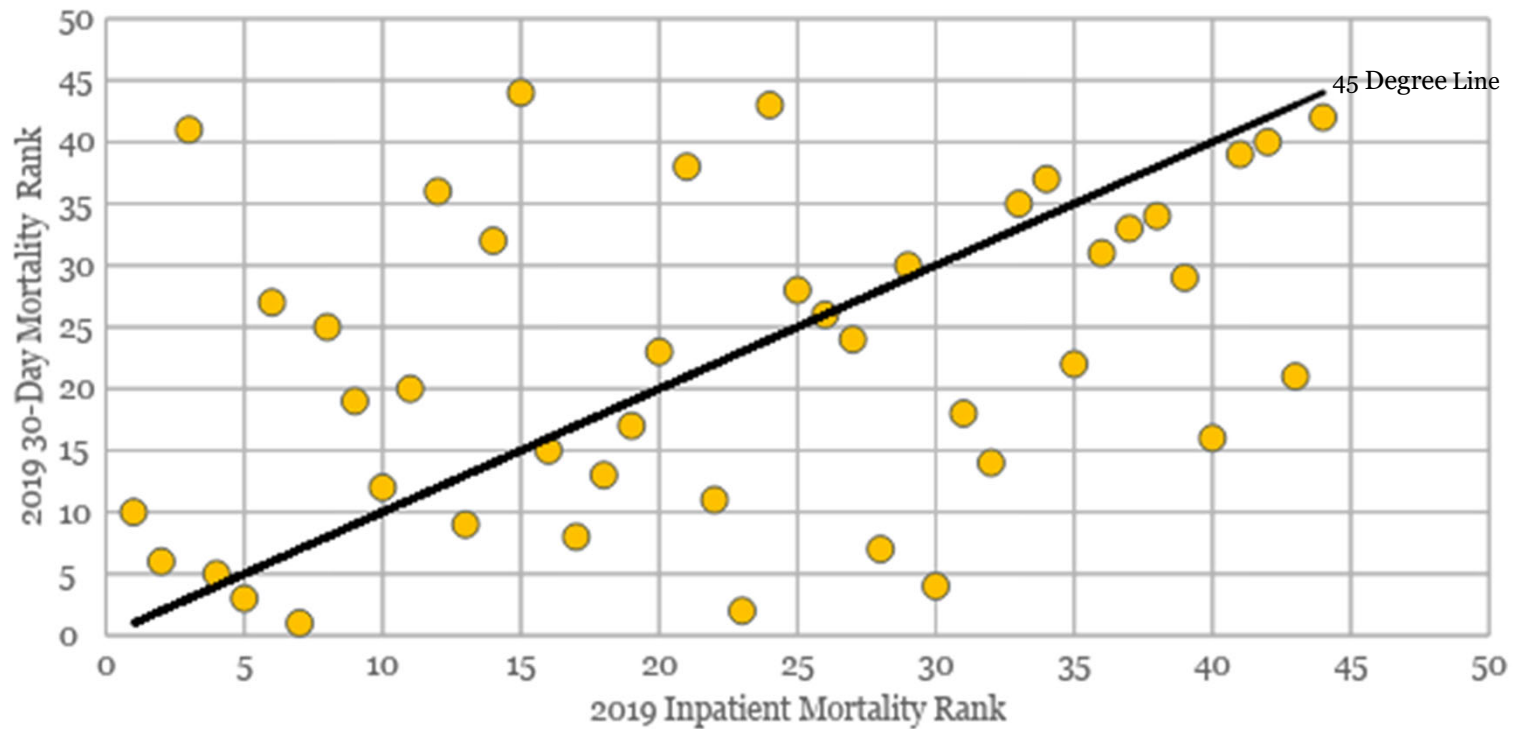
Comparison to inpatient mortality measure (2018)

Comparison of 30-Day Mortality to Inpatient Mortality



Comparison to inpatient mortality measure (2019)

Comparison of 30-Day Mortality to Inpatient Mortality



Overview of statistical properties of 30-day mortality measure

Measure Assessment: Three Categories of Criteria



Feasibility Criteria

Evidence that data needed for measurement is available

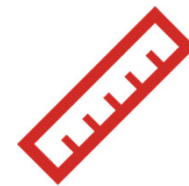
➔ Not a focus of today's presentation, but we expect measure to pass this step



Validity Criteria

Evidence that the measure is measuring what it is supposed to measure

➔ Multiple steps/checks, but today's presentation will focus on **convergent validity** and **predictive validity**



Reliability Criteria

Evidence that the measure consistently produces the same result, versus measure results being a product of statistical noise

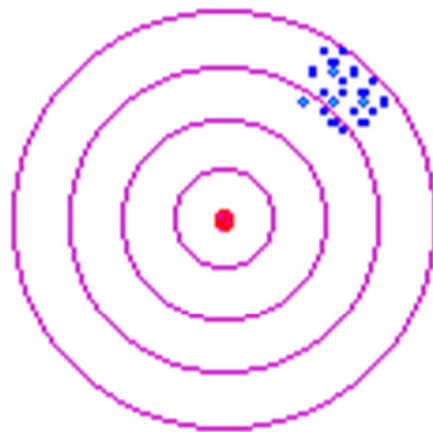
➔ Implemented a **signal-to-noise test** for the 30-day measure

Validity and Reliability Analyses

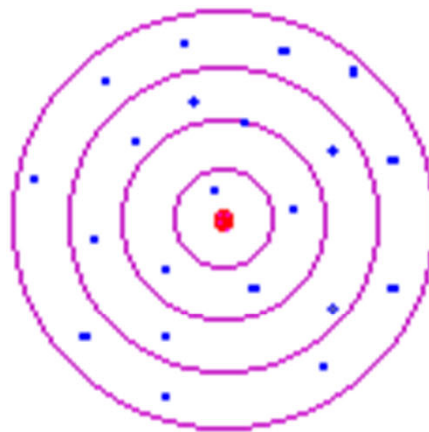
- **Convergent validity: correlate 30-day measure results with other existing measures of quality**
 - CMS overall star rating
 - CMS diagnosis and procedure-specific 30-day mortality results (July 2015 – June 2018 results)
 - HSCRC Inpatient mortality results from QBR (CY 2018 results)
 - Use rank correlations when comparing mortality measure results
- **Predictive validity: correlate 30-day measure results from 2018 with results from 2019**
- **Reliability analysis: calculate signal-to-noise test**
 - Calculated for overall measure reliability, and by hospital



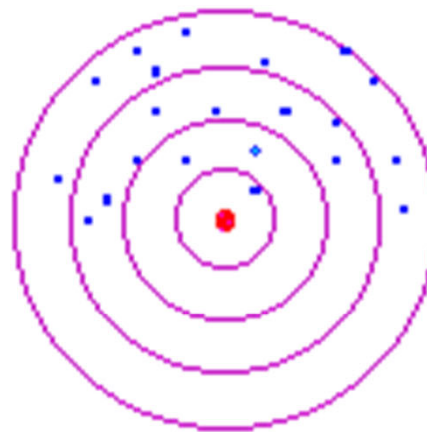
More on Validity and Reliability Analyses



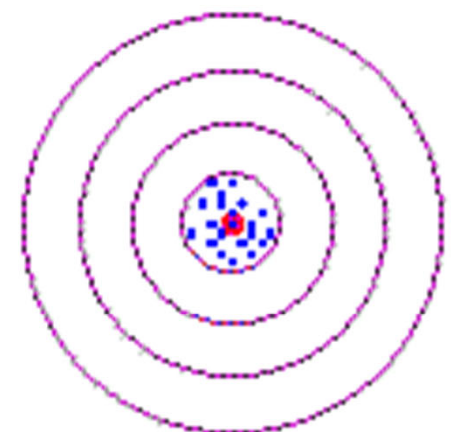
**Reliable
Not Valid**



**Valid
Not Reliable**

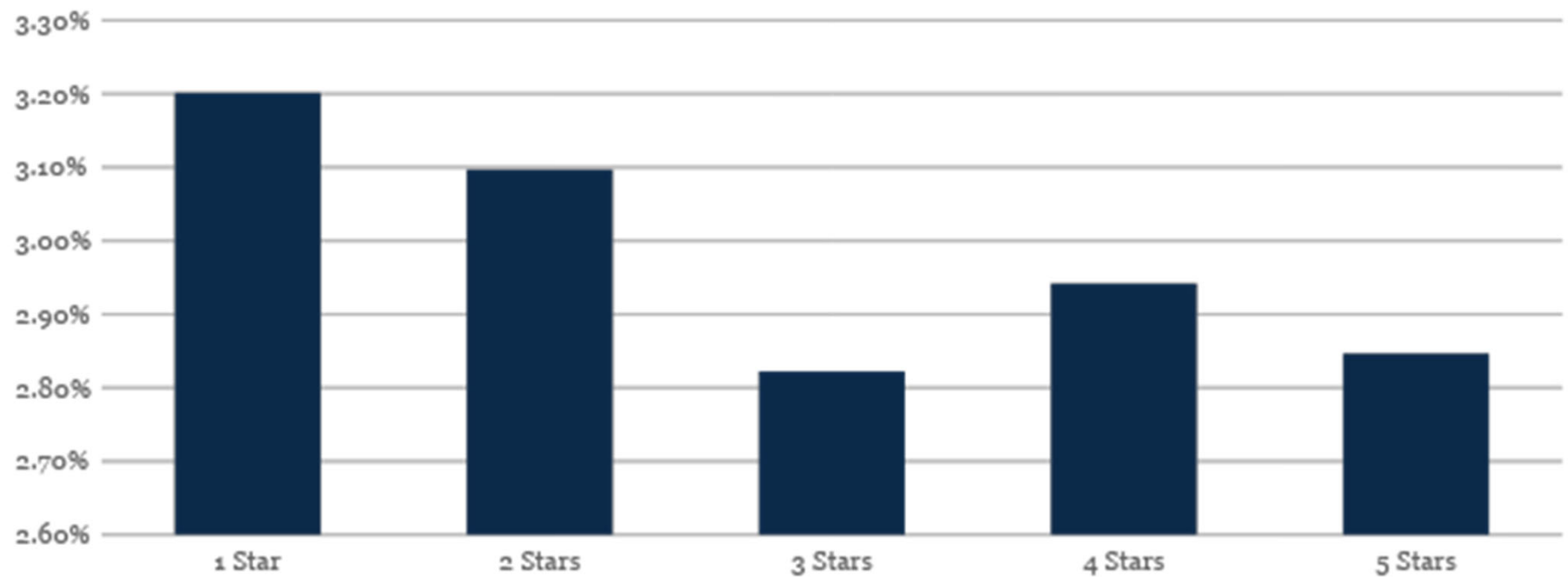


**Neither Reliable
Nor Valid**



**Both Reliable
And Valid**

Convergent validity: comparison to CMS Star Ratings

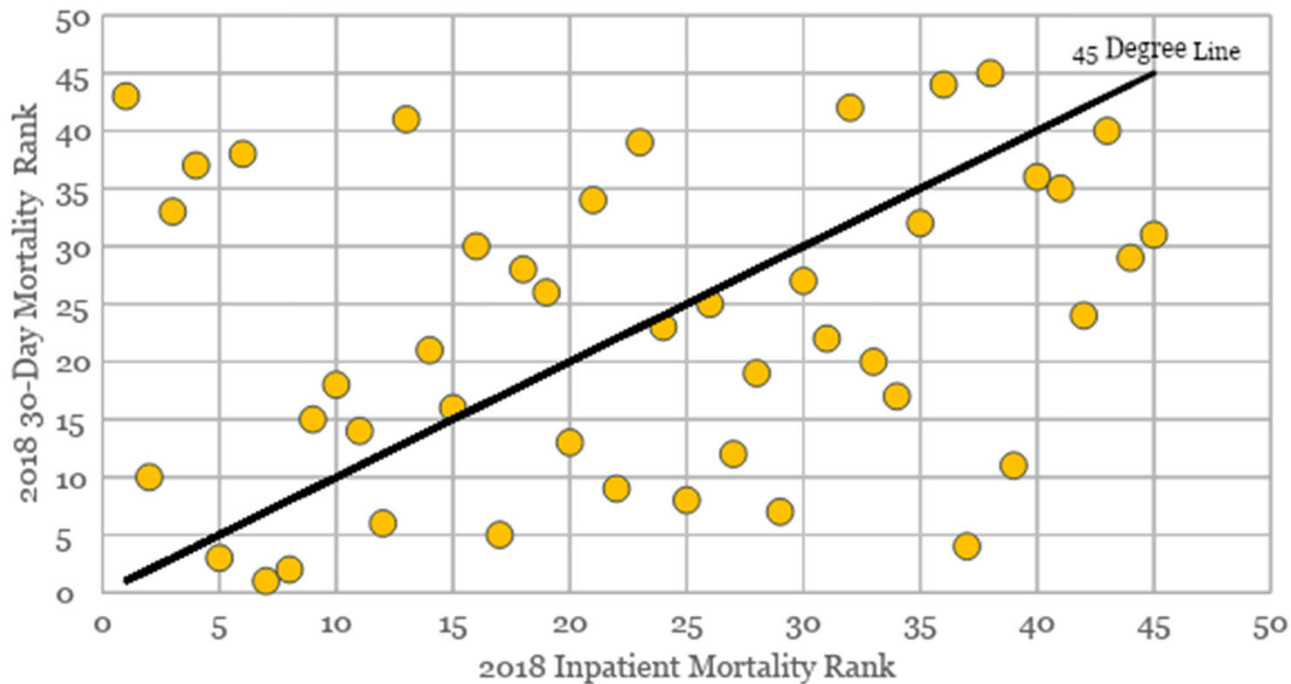


Convergent validity: comparison to CMS 30-day mortality results

| CMS 30-Day Mortality Rate for... | Correlation Statistic | p-value |
|----------------------------------|-----------------------|---------|
| AMI | 0.49 | <0.01 |
| CABG | -0.36 | 0.31 |
| COPD | 0.13 | 0.39 |
| Heart Failure | 0.42 | <0.01 |
| Pneumonia | 0.29 | 0.06 |
| Stroke | 0.13 | 0.40 |

Convergent validity: comparison to HSCRC inpatient mortality results

Comparison of 30-Day Mortality to Inpatient Mortality



- Low rank correlation between All-Payer 30-day Mortality results and QBR Inpatient Mortality results
- 2018 correlation = .24
- 2019 correlation = .39

Predictive validity results

- **CY 2018 and CY 2019 All-Payer 30-Day Mortality results are positively correlated**
 - Correlation coefficient = 0.84 with p-value <.01



Reliability results

- **Strong reliability for All-Payer 30-Day Mortality Measure**
- **Overall reliability = 0.86**
- **Variation in hospital-level reliability estimates**
 - Minimum = .26; Maximum = .96
- **82% of hospitals have reliability of at least 0.70**
- **Hospitals with lower reliability estimates have smaller case sizes**





Questions and discussion



Elective THA/TKA Complications

- As with national VBP, QBR uses the THA-TKA complication measure in QBR weighted at 5 percent of the clinical care domain
- Complications include:
 - **AMI** during index or subsequent admission that occurs within 7 days;
 - **Pneumonia** or other acute respiratory complication during index or subsequent admission that occurs within 7 days;
 - **Sepsis**, septicemia, shock during index or subsequent admission that occurs within 7 days;
 - Surgical site **bleeding** or other surgical site complication during the index admission or a subsequent inpatient admission within 30 days from the start of the index admission;
 - **Pulmonary embolism** during the index admission or a subsequent inpatient admission within 30 days from the start of the index admission;
 - **Death** during the index admission or within 30 days from the start of the index admission;
 - **Mechanical complication** during the index admission or a subsequent inpatient admission that occurs within 90 days from the start of the index admission; or
 - Periprosthetic joint infection/wound **infection** or other wound complication during the index admission or a subsequent inpatient admission that occurs within 90 days from the start of the index admission.

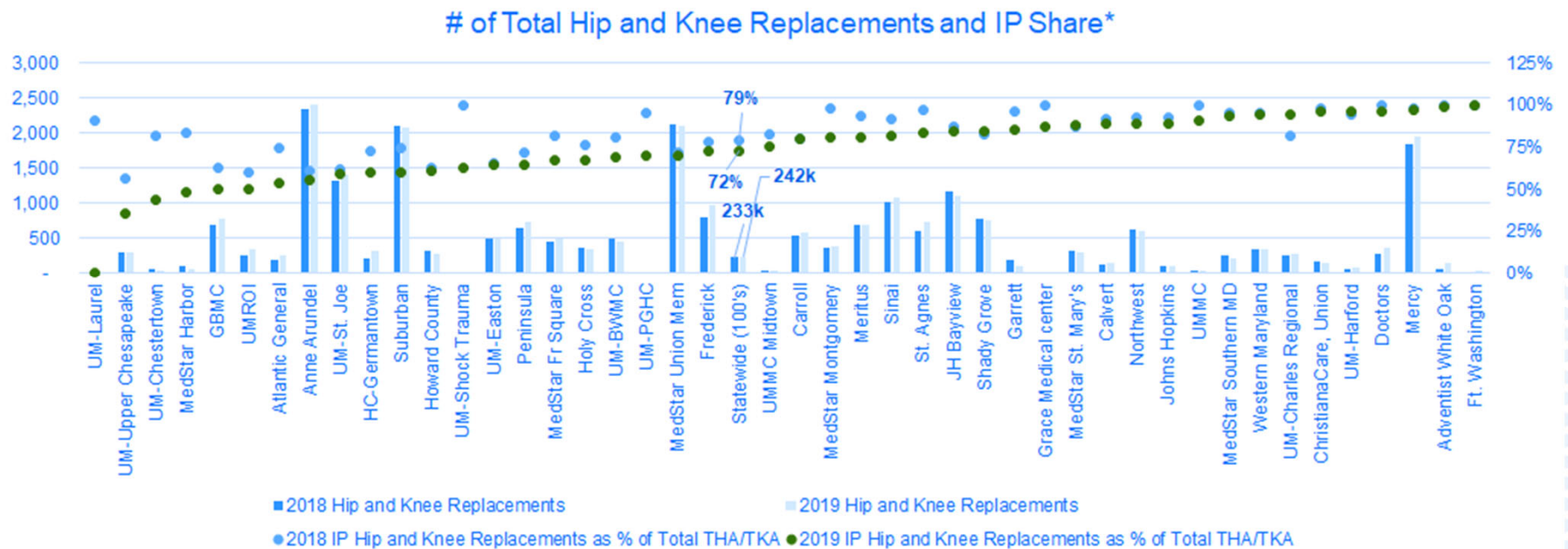
THA-TKA Considerations

Considerations:

1. Volume of THA/TKA that is moving to outpatient, Physician Outpatient Surgery Center/Ambulatory Surgery Center spaces
1. All-Payer nature of our programs and use of a Medicare only measure
1. Other measures of THA-TKA complications/quality of care

1. Movement of THA-TKA Procedures from IP

- THA-TKA procedures no longer on the Medicare IP only list
- Statewide the percent of all-payer inpatient THA-TKA procedures dropped from 79 percent in 2018 to 72 percent in 2019, while the volume of procedures increased from 23.3k to 24.2k



2. Medicare vs. non-Medicare Procedures

Percent of procedures:

- 2018: 56% Medicare FFS & Medicare Advantage (MA)
- 2019: 57% Medicare FFS & MA

- Could identify the complications on an all payer basis using case-mix data
- Non-hospital claims used for the Medicare risk adjustment model

3. Other Measures

- **Electronic quality measure for THA-TKA complications**
 - CMS funded Brigham and Women's Hospital to develop this measure in 2020 for MIPS
 - Uses same complications as the current claims based measure
 - All-payer measure that includes both inpatient and outpatient procedures (age 18+)
 - Aligns with our current strategy and investment to begin collecting eCQMs
- **IPPS proposed rule asks for comment on a hospital-level patient-reported outcome performance measure (PRO-PM) following elective primary THA-TKA procedure**
 - Meaningful Measures 2.0 is currently underway and aims to promote better collection and integration of patients' voices by incorporating PRO measures that are embedded into the clinical workflow, are easy to use, and reduce reporting burden
 - CMS used this measure as part of the Comprehensive Care for Joint Replacement model
 - As with eCQMs should state explore development of infrastructure for collecting PROs?

Topic 3: QBR Subgroup Next Steps

QBR Subgroup Meeting Dates and Anticipated Topics



March 17-

- Subgroup overview
- HCAHPS



April 21-

- NHSN HAI measures
- ED Wait Times



May 19-

- SIHIS-aligned measures: Follow-up after discharge (all-payer population, behavioral health); other care coordination measures?
- Refinement of existing measures: 30-day all-payer mortality, THA-TKA all-payer measure

June 16-

- Outpatient measure expansion options: THA/TKA, outpatient surgery and colonoscopy hospital return
- Other measure topics: e.g., sepsis, maternal health, palliative care

July 21-

- Finalize subgroup recommended updates



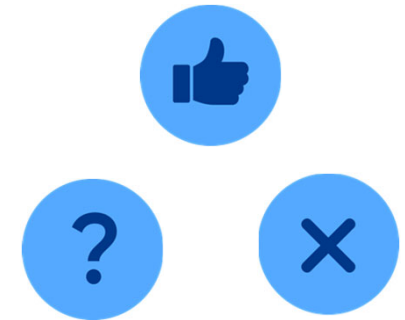
Report to CMMI on QBR redesign process and decisions due mid August

Next Steps

- **June 16 meeting:** focus on outpatient hospital measures and any other new areas suggested by staff or stakeholders

Topics to revisit in June/July:

- Person and community experience domain
 - HCAHPS linear scores and voluntary upfront investment fund
 - eCQM strategy and ED wait times
 - Follow-up for Medicaid and Behavioral health
- Clinical care domain
 - THA-TKA
 - 30-day mortality
- Safety Domain
 - Other eCQMs? Other measures?



Looking for workgroup member input to make recommendations for PMWG and for CMMI report

Thank you and Next Meeting

- Thank you for your participation in the inaugural Subgroup Meeting.
- Next month's meeting will be held on **June 16, 2021**
 - The main Meeting Topics will be:
 - 1. Outpatient Measures**
 - 2. Other Topic Areas (Sepsis, Maternal Health, Palliative Care)**
 - We will also incorporate feedback from today's meeting, as appropriate
- We appreciate your comments! Please continue to submit feedback through hscrc.quality@maryland.gov



Appendix: Extra Mortality Slides

Distribution of stays by exclusion criteria (CY 2018)

| Initial Sample | Dropped Cases | Resulting Sample |
|---|----------------|------------------|
| 524,373 | | |
| Exclusion Criteria | 88,391 | 435,442 |
| <i>Transferred in from another facility</i> | 11,614 | |
| <i>Age > 95</i> | 3,634 | |
| <i>Hospice enrollment at time of admission, or discharge to hospice setting</i> | 8,761 | |
| <i>Metastatic cancer</i> | 27,316 | |
| <i>Limited ability to affect survival</i> | 405 | |
| <i>Inconsistent vital status</i> | 5 | |
| <i>AMA</i> | 8,189 | |
| <i>Crush, spinal, brain, or burn injury</i> | 3,488 | |
| <i>Non-Maryland resident</i> | 34,529 | |
| Random Exclusion | 116,668 | 318,774 |
| Additional Dropped Cases | 26,331 | 292,443 |
| <i>No service line assigned</i> | 23,096 | |
| <i>APR-DRG cell size < 20</i> | 3,212 | |
| <i>Missing Risk of Mortality</i> | 23 | |
| Final Sample for Model | | 292,443 |

Distribution of stays by service line (CY 2018)

| Non-Surgical | # of Stays | # of Deaths | Unadjusted Mortality Rate |
|--|----------------|--------------|---------------------------|
| Cancer | 1,354 | 106 | 7.83% |
| Cardiac | 18,517 | 620 | 3.35% |
| Gastrointestinal | 18,814 | 324 | 1.72% |
| Infectious Disease | 30,801 | 2161 | 7.02% |
| Neurology | 13,917 | 650 | 4.67% |
| Orthopedics | 5770 | 124 | 2.15% |
| Pulmonary | 24,981 | 1,091 | 4.37% |
| Renal | 17,244 | 652 | 3.78% |
| Other Conditions | 33,730 | 801 | 2.37% |
| Subtotal | 165,128 | 6,529 | 3.95% |
| | | | |
| Surgical | # of Stays | # of Deaths | Unadjusted Mortality Rate |
| Cancer | 3,408 | 26 | 0.76% |
| Cardiothoracic | 4,193 | 187 | 4.46% |
| General | 15,839 | 235 | 1.48% |
| Neurosurgery | 1,431 | 78 | 5.45% |
| Orthopedic | 31,280 | 193 | 0.62% |
| Other | 11,249 | 174 | 1.55% |
| Subtotal | 67,400 | 893 | 1.32% |
| | | | |
| Surgical and Non-Surgical Total | 232,528 | 7,422 | 3.19% |
| | | | |
| Maternity | # of Stays | # of Deaths | Unadjusted Mortality Rate |
| | 59,915 | 4 | 0.01% |



M

Results for Maryland Medicare FFS population

| Non-Surgical | # of Stays | # of Deaths | Unadjusted Mortality Rate | CMS Unadjusted Mortality Rate* |
|--------------------|---------------|--------------|---------------------------|--------------------------------|
| Cancer | 495 | 88 | 17.78% | 14.60% |
| Cardiac | 8,661 | 461 | 5.32% | 6.50% |
| Gastrointestinal | 7,175 | 283 | 3.94% | 4.90% |
| Infectious Disease | 13,386 | 1,774 | 13.25% | 13.00% |
| Neurology | 6,542 | 605 | 9.25% | 8.00% |
| Orthopedics | 3,171 | 127 | 4.01% | 4.90% |
| Pulmonary | 11,030 | 1,015 | 9.20% | 9.50% |
| Renal | 8,999 | 651 | 7.23% | 8.80% |
| Other Conditions | 10,479 | 519 | 4.95% | 5.60% |
| Subtotal | 69,938 | 5,523 | 7.90% | 8.28% |
| Surgical | # of Stays | # of Deaths | Unadjusted Mortality Rate | CMS Unadjusted Mortality Rate |
| Cancer | 1,016 | 18 | 1.77% | 2.30% |
| Cardiothoracic | 1,603 | 74 | 4.62% | 6.40% |
| General | 3,060 | 144 | 4.71% | 6.60% |
| Neurosurgery | 378 | 42 | 11.11% | 3.00% |
| Orthopedic | 12,918 | 159 | 1.23% | 1.50% |
| Other | 2,396 | 103 | 4.30% | 4.10% |
| Subtotal | 21,371 | 540 | 2.53% | 3.22% |
| GRAND TOTAL | 91,309 | 6,063 | 6.64% | 6.77% |



*CMS numbers taken from 2019 QualityNet Conference presentation by Yale/CORE