Findings from the OY2 Hospital Evaluation Study: The Combined Effects of HVBP, HACRP, and HRRP on Measured Outcomes

Yuki Hayashi, Kris Mattivi, Noy Birger, Sriniketh Nagavarapu, Jennifer Beltran, Nolan Winkler, Brian Fry, Christina Chu, Sharoni Bandyopadhyay, Gianluca Pedrani, Jiacheng Wu, Matt Zheng, from Acumen, LLC, with Anthony Oliver of CMS

STUDY GOALS

Evaluate the impacts of three CMS programs: (1) Hospital Value-Based Purchasing (HVBP) Program, (2) Hospital Acquired Condition Reduction Program (HACRP), and (3) Hospital Readmission Reduction Program (HRRP) to provide insight on: (i) how hospital performance on program-targeted health outcomes changed over time, and (ii) whether the programs are fulfilling their purpose of incentivizing care improvement.

METHODOLOGY

Key Metrics

- **Raw adverse outcome count:** Raw, non-risk-adjusted adverse outcomes captured under HACRP, HVBP Safety domain[1] and HRRP.
- **Hospital patient composition:** Each hospital's patient composition, calculated based on 2020 inpatient claims and beneficiary data.
- **Net payment adjustment percentage:** The total payment adjustment a hospital received across HRRP, HVBP, and HACRP for a given PDY.[2] The HACRP adjustment percentage was recalculated to make it comparable to the HRRP and HVBP adjustments.

Analysis Methodology

Table 1 shows results from **Difference-in-Difference (DiD)** analyses that examined whether hospitals eligible for HRRP reduced readmissions more than hospitals that are not eligible (Maryland and Critical Access Hospitals) during periods when HRRP was in effect. We used Medicare FFS inpatient claims data to calculate hospital-level, non-risk-adjusted 30-day readmission rates for each HRRP condition and procedure. We estimated OLS regression models using the readmission rates as the dependent variable, and the following independent variables: a treatment group indicator, time period indicators, interaction terms between treatment and time period indicators, seasonality (quarter), and a fixed effect for each hospital.

[1] HVBP measures for which non-risk-adjusted data were unavailable were excluded in raw adverse outcome calculations

[2] PDY: Payment Determination Year

KEY FINDINGS

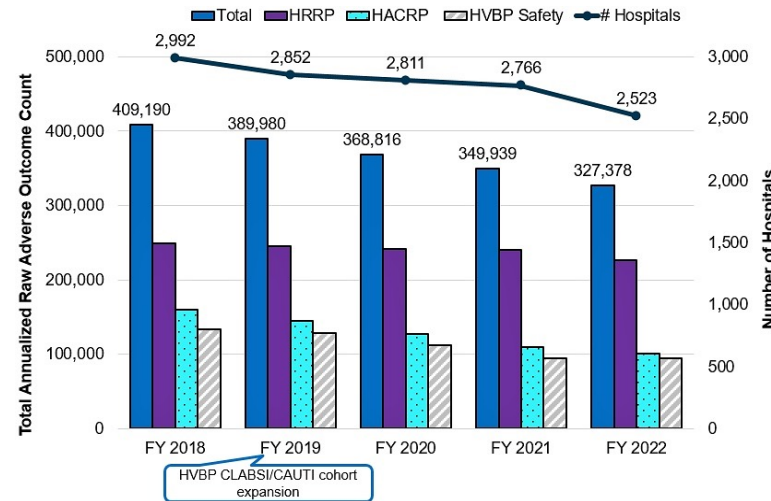### Figure 1. Annualized Raw Adverse Outcome Count, as Measured by the Programs

Figure 1: Across hospitals, the cross-program **total number of raw adverse outcomes steadily decreased** between FY2018 and FY2022 PDYs.

Figure 2. FY2022 Median Net Payment Adjustment (%) Stratified by Hospital Patient Composition[†]
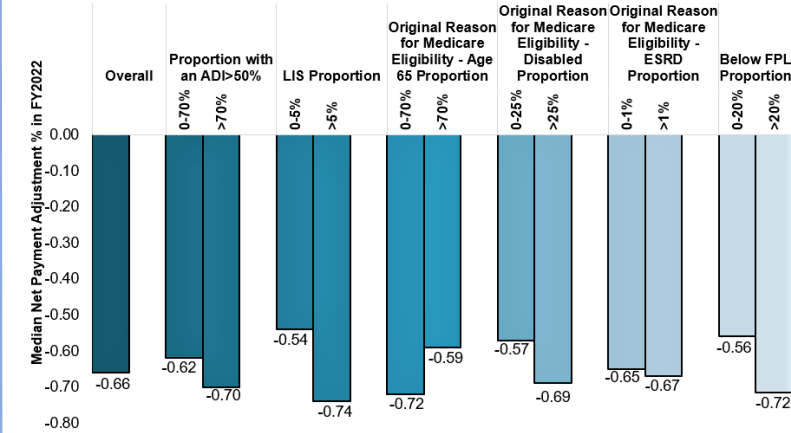

Figure 2: There are **considerable differences in the median net payment** adjustment percentage when stratifying hospitals by patient composition.

[†] Because HVBP provided neutral payments in FY2022 PDY, the net payment adjustment percentage in FY2022 PDY reflects the sum of payments across HACRP and HRRP.

Table 1. Predicted AMI Readmission Rate over Time by HRRP Eligibility

Difference in Change in 30-day raw readmission rate from pre-HRRP period (HRRP eligible – non-eligible hospitals)	AMI	
Independent variables	Coefficient	95% CI
HRRP Participation * Time Period 2	**-1.65±**	(-2.99, -0.30)
HRRP Participation * Time Period 3	-1.24	(-3.05, 0.58)
HRRP Participation * Time Period 4	0.28	(-0.90, 1.47)
HRRP Participation * Time Period 5	0.13	(-1.14, 1.41)
HRRP Participation * Time Period 6	0.23	(-0.95, 1.42)

± $p<0.05$

Table 1: DiD regressions showed HRRP-eligible hospitals had **greater reduction in acute myocardial infarction (AMI) readmissions**, but only in the time period immediately after introduction of HRRP. There was no similar effect for the remaining HRRP index conditions.

The time periods reflect the timings of HVBP and HACRP implementation, and when the HRRP measure set was expanded.
- Time period 1:.Pre-HRRP implementation
- Time period 2: Start of HRRP until start of HVBP
- Time period 3: Start of HVBP until start of HACRP
- Time period 4: Start of HACRP until addition of HRRP COPD/THA/TKA
- Time period 5: HRRP COPD/THA/TKA addition until addition of HRRP CABG
- Time period 6: Post HRRP CABG addition