Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.
Figure. Derivation of study sample

15,557,810 Hospitalizations Among 3,866 Facilities
January 2008-December 2015.

- **Hospital Level Exclusions:**
  - Cancer Hospitals, Federal Hospitals, Maryland Hospitals (N=404,147)

- **Enrollment Exclusions**
  - Not enrolled for 12 months prior to index hospitalization (N=1,800,844)

- **Diagnosis-Related Exclusions**
  - Primary psychiatric diagnosis or Rehabilitation hospitalization or Hospitalization for cancer treatment (N=580,619)

- **Disposition Exclusions**
  - Discharged against medical advice or transferred to another hospital or died during hospital stay (N=815,132)

11,957,068 Hospitalizations Among 3,763 Facilities

- **Non-Target Group Exclusions:**
  - COPD, Hip & Knee Replacement (N=694,899)
  - Non-parallel trends (N=2,317,874)

8,944,295 Hospitalizations Among 3,748 Facilities

- **1,406,451 Hospitalizations for Target Conditions**
  - Heart Failure (N=635,971); Myocardial Infarction (N=271,916); Pneumonia (N=498,564)

- **7,537,844 Hospitalizations for Non-Target Conditions**
eTable 1. CCS conditions excluded from nontarget group due to nonparallel baseline trends

| Category                                           | N     | % total |
|----------------------------------------------------|-------|---------|
| 46 (Benign Uterine Neoplasm)                       | 1,920 | 0.02    |
| 52 (Nutritional deficiencies)                      | 4,340 | 0.04    |
| 76 (Meningitis)                                    | 2,323 | 0.02    |
| 106 (Cardiac dysrhythmias)                         | 489,595 | 4.61 |
| 115 (Aortic; peripheral; visceral artery aneurysms)| 44,165 | 0.42    |
| 137 (Diseases of mouth; excluding dental)          | 5,903 | 0.06    |
| 143 (Abdominal hernia)                             | 78,083 | 0.74  |
| 147 (Anal and rectal conditions)                   | 15,166 | 0.14    |
| 149 (Biliary tract disease)                        | 128,977 | 1.22  |
| 157 (Acute and unspecified renal failure)          | 246,432 | 2.32  |
| 160 (Calculus of urinary tract)                    | 40,668 | 0.38    |
| 162 (Other diseases of bladder and urethra)        | 11,699 | 0.11    |
| 170 (Prolapse of female genital organs)            | 32,807 | 0.31    |
| 203 (Osteoarthritis)                               | 447,895 | 4.22  |
| 205 (Spondylosis; back problems)                   | 206,939 | 1.95  |
| 211 (Other connective tissue disease)              | 68,195 | 0.64    |
| 244 (Other injuries/conditions due to external causes) | 31,957 | 0.30    |
| 245 (Other injuries/conditions due to external causes) | 205,088 | 1.93  |
eTable 2. Characteristics of the Study Population Overall.

|                                | Overall (N= 8,944,295) | Target Conditions (N= 1,406,451) | Non-Target Conditions (N= 7,537,844) |
|--------------------------------|-------------------------|----------------------------------|-------------------------------------|
| Age, y, mean (SD)              | 78.7 (8.2)              | 79.9 (8.3)                       | 78.5 (8.1)                          |
| Female, %                      | 5,168,527 (58.6)        | 743,852 (53.8)                   | 4,424,675 (59.5)                    |
| Race/Ethnicity, %              |                         |                                  |                                     |
| White                          | 7,601,871 (85.0)        | 1,204,607 (85.7)                 | 6,397,264 (84.9)                    |
| Black                          | 896,193 (10.0)          | 134,073 (9.5)                    | 762,120 (10.1)                      |
| Asian                          | 117,102 (1.3)           | 17,784 (1.3)                     | 99,318 (1.3)                        |
| Hispanic                       | 180,064 (2.0)           | 27,525 (2.0)                     | 152,539 (2.0)                       |
| North American Native          | 42,364 (0.5)            | 7,174 (0.5)                      | 35,190 (0.5)                        |
| Other                          | 88,309 (1.0)            | 12,676 (0.9)                     | 75,633 (1.0)                        |
| Unknown                        | 18,392 (0.2)            | 2,612 (0.2)                      | 15,780 (0.2)                        |
| Dual Eligibility Status, %     | 2,210,817 (24.7)        | 351,626 (25.0)                   | 1,859,191 (24.6)                    |
| No. Comorbidities, mean (SD)   | 5.8 (3.3)               | 6.9 (3.0)                        | 5.6 (3.3)                           |
| Type of Hospitalization, %     |                         |                                  |                                     |
| Inpatient                      | 7,550,738 (84.4)        | 1,360,164 (96.7)                 | 6,190,574 (821)                     |
| Observation Stay               | 1,393,557 (15.6)        | 46,287 (3.3)                     | 1,347,270 (17.9)                    |
| Length of Stay, mean (SD)      | 5.2 (4.5)               | 6.0 (4.3)                        | 5.1 (4.5)                           |
| Rehospitalization at 30-Days, %|                         |                                  |                                     |
| Inpatient                      | 1,534,392 (17.2)        | 299,098 (21.3)                   | 1,235,294 (16.4)                    |
| Observation Stay               | 207,092 (2.3)           | 32,546 (2.3)                     | 174,546 (2.3)                       |
eTable 3. Adjusted trends (slope) in rehospitalization under scenarios that exclude and include observation stays.

| 30-Day Event          | Population          | Group    | Pre-ACA (Baseline) | Post-ACA/Pre-HRRP (Period 2) | Δ (Period 2 - Baseline) | Post-HRRP (Period 3) | Δ (Period 3 - Baseline) |
|-----------------------|---------------------|----------|--------------------|------------------------------|-------------------------|----------------------|------------------------|
| Inpatient Readmissions| Inpatient Discharges| Target   | -0.05 (-0.22, 0.13) | -0.46 (-0.61, -0.30)         | -0.41 (-0.64, -0.18)    | 0.02 (-0.08, 0.12)   | 0.07 (-0.14, 0.27)     |
|                       |                     | Non-Target| -0.13 (-0.30, 0.01) | -0.40 (-0.55, -0.26)         | -0.27 (-0.40, -0.04)    | -0.06 (-0.16, 0.04)  | 0.07 (-0.14, 0.27)     |
| All Unplanned Rehospitalizations | All Hospital Discharges | Target   | 0.10 (-0.08, 0.29)   | -0.29 (-0.44, -0.13)         | -0.39 (-0.63, -0.15)    | 0.17 (0.07, 0.28)     | 0.07 (-0.14, 0.27)     |
|                       |                     | Non-Target| -0.04 (-0.22, 0.13)  | -0.33 (-0.48, -0.18)         | -0.29 (-0.53, 0.05)     | 0.03 (-0.07, 0.14)   | 0.07 (-0.14, 0.28)     |

**Note:** Slopes expressed as mean percentage point change per year in readmission rate for each policy period. Bolded values indicate within-group changes that are significantly different than baseline.
eTable 4. Sensitivity analysis comparing differential changes in readmission rate over time among HRRP-exposed and HRRP-exempt hospitals, under scenarios that exclude and include observation stays.

|                          | Baseline (Period 1) | HRRP Announced (Period 2) | \( \Delta \) (Period 2-Baseline) | HRRP Penalties Implemented (Period 3) | \( \Delta \) (Period 3-Baseline) |
|--------------------------|---------------------|---------------------------|----------------------------------|---------------------------------------|----------------------------------|
| **Base Scenario** (Inpatient Readmissions Following Inpatient Discharges Only) | | | | | |
| HRRP Hospitals           | 22.63% (22.40, 22.87) | 21.98% (21.75, 22.20) | -0.66 (-0.98, -0.33) | 20.39% (20.19, 20.59) | -2.24 (-2.55, -1.93) |
| Exempt Hospitals         | 22.37% (22.13, 22.60) | 21.47% (21.24, 21.69) | -0.90 (-1.23, -0.57) | 19.63% (19.43, 19.83) | -2.73 (-3.04, -2.42) |
| Difference-in-Differences| 0.24 (-0.22, 0.70)   |                           |                                 |                                       | 0.49 (0.05, 0.93)               |
| **Expanded Scenario** (Observation Stays Counted as Index Discharges and Readmission Events) | | | | | |
| HRRP Hospitals           | 23.86% (23.63, 24.09) | 23.52% (23.30, 23.74) | -0.33 (-0.66, -0.02) | 22.50% (22.31, 22.69) | -1.36 (-1.66, -1.06) |
| Exempt Hospitals         | 23.52% (23.29, 23.75) | 22.94% (22.72, 23.16) | -0.58 (-0.89, -0.26) | 21.66% (21.46, 21.85) | -1.87 (-2.17, -1.56) |
| Difference-in-Differences| 0.24 (-0.21, 0.69)   |                           |                                 |                                       | 0.50 (0.08, 0.93)               |