Does Financial Distress Make Hospitals Unethical?
: Evidence From ACA Medicaid Expansion and Medicare Upcoding

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Motivation

1. Medicare Severity Diagnosis Related Group (MS-DRG):
   - DRG determines how much Medicare will pay for each patient, along with the hospital's reimbursement rate.
   - After 2007, CMS revised DRG weights to consider the severity of patient conditions.
   - For example, a hospital stay for sepsis treatment could be coded as one of the following and get paid accordingly in 2020:
     - DRG 870 Septicemia or severe sepsis with MV > 96 hours ($37,851)
     - DRG 871 Septicemia or severe sepsis without MV > 96, hours with MCC ($11,006)
     - DRG 872 Septicemia or severe sepsis without MV > 96, hours without MCC ($6,018)
2. Upcoding in Medicare DRG:
   - Hospitals have incentives to code as higher severity stays regardless of the actual patient condition.
   - 2021 report from Office of Inspector General (OIG) shows the upward trend of the highest coding shares (Figure 1)
   - and decreasing trend of actual lengths of stays at the same time. (Table 1)
   - This suggests that upcoding is actually prevalent among healthcare providers.

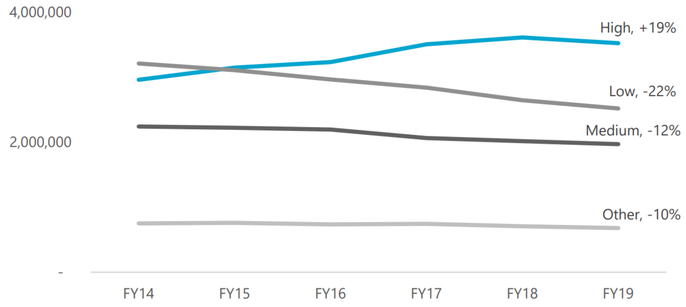


Figure 1. Trends of Medicare Inpatient Hospital Stays with Different Severity Levels

Severity Level	Average Length of Stay, FY 2014 (in Days)	Average Length of Stay, FY 2019 (in Days)	Change* (in Days)
High	6.9	6.4	-0.5
Medium	4.7	4.3	-0.4
Low	3.3	3.0	-0.3
Other	6.5	6.1	-0.3
All stays	5.1	4.9	-0.1

Table 1. Changes in Average Length of Stays, 2014 vs 2019

3. Impact of Financial Shock on Upcoding:
   - Some hospitals could have been "forced" to upcode because of financial distress.
   - In such cases, improving financial status could help reduce unethical hospital behaviors.
   - To test such a hypothesis, I examine how hospital coding practices change after a positive financial shock.
   - Leverage ACA Medicaid expansion in 2014 which significantly reduced hospitals' uncompensated care, improving their financial health

ACA Medicaid Expansion

One of the biggest reform that the Affordable Care Act (ACA) in 2010 has introduced was the Medicaid expansion. While Medicaid is a public health insurance program for people with low income or disabilities, the reform greatly expanded the eligibility of Medicaid, which was somewhat limited before. Some key features and consequent implications were:

1. Adults under age 65 with incomes up to 138% of Federal Poverty Line (FPL) newly became eligible for Medicaid benefits.

2. Some states opted out of the reform and only 32 states had expanded their state Medicaid programs by 2018. (Figure 2)

3. Studies so far have revealed that the Medicaid expansion effectively reduced rates of uninsured, amounts of uncompensated care and improved financial status of many hospitals in expansion states.

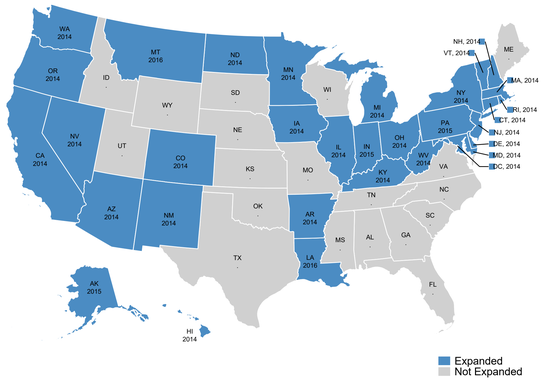


Figure 2. Implementation of State Medicaid Expansion by 2018

Research Question

- Did ACA Medicaid expansion improve financial health of hospitals previously in financial distress?
  - Consistent reports on improved hospital finance in expansion states
  - I focus on hospitals that were losing money prior to 2014.
- If it did, how were shares of the highest severity inpatient stays in Medicare consequently affected?
  - Here, I use DRG 870-872 (sepsis treatment) for preliminary results.
  - One of DRGs suspected by OIG for frequent incorrect billings leading to overpayment
- This research needs following assumption to correctly identify effects on coding practices:
  - The Medicaid expansion had no significant spillovers to the Medicare population and their healthcare utilization except via hospital finance.

Data

- RAND Hospital Data
  - Yearly data on hospital finance, employment, size, investment, etc.
  - Used to estimate first-stage impacts on financial health of previously distressed hospitals
- Medicare Inpatient Hospitals by Provider and Service Data
  - DRG-provider-year level data on the number of inpatient discharges
  - Public data published by CMS with some degree of censoring
  - Used to estimate impacts on Medicare coding practices of hospitals

Econometric Model

I use following TWFE difference-in-differences frameworks exploiting state-level variations in the Medicaid expansion and hospital-level variations in prior financial distress.

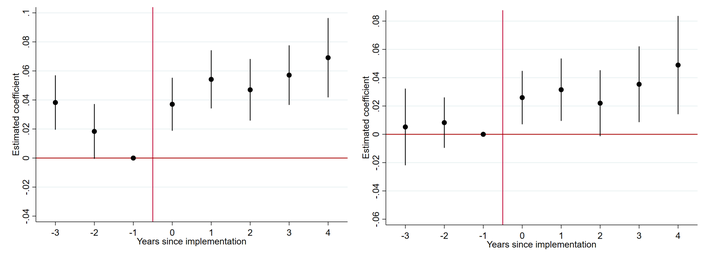
$$Y_{ist} = \sum_{\substack{k\neq -1 \\ k=-3}}^{4} \{\beta_k \times Exp_{sk} \times \mathbf{1}\,(t - t_s^* = k)\} + f(X_{ist}) + \tau_t + \lambda_i + \epsilon_{ist} \tag{1}$$

$$\begin{aligned} Y_{ist} = &\sum_{\substack{k\neq -1 \\ k=-3}}^{4} \{\gamma_k \times Dist_i \times Exp_{sk} \times \mathbf{1}\,(t - t_s^* = k)\} \\ &+ \sum_{\substack{k\neq -1 \\ k=-3}}^{4} \{\beta_k \times Exp_{sk} \times \mathbf{1}\,(t - t_s^* = k)\} + f(X_{ist}) + \tau_t + \lambda_i + \epsilon_{ist} \end{aligned} \tag{2}$$

- Y_{ist} represents outcome variables of each hospital i at year t. They include annual operating margins and shares of the highest severity stays of a DRG.
- Exp_{st} equals 1 if state s implemented the Medicaid expansion at year t.
- $Dist_i$ equals 1 if hospital i had an average operating margin lower than -2% for 3 years before the expansion. (2014 for non-expansion states)
- $f(X_{ist})$ is a set of time-varying controls (e.g.,number of beds, full-time nurses, etc.)
- τ_t and λ_i are year and hospital fixed effects respectively.
- Standard errors are clustered at the state level.

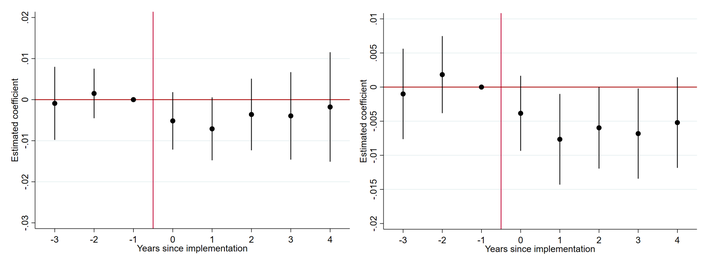
Results

- Figure 3 (a) and (b) shows the results on **hospital margins** from eq (1) and (2), revealing that financially distressed hospitals experienced 2 $\sim$ 4%p gains in margins after the Medicaid expansion.
- Figure 4 (a) and (b) shows the results on **shares of the highest severity stays** from eq (1) and (2). They indicate hospital became approximately 10% less likely to code as highest severity stays after the expansion.



(a) Equation (1) (b) Equation (2)

Figure 3. Hospital operating margins improved after Medicaid expansions.



(a) Equation (1) (b) Equation (2)

Figure 4. Providers became less likely to charge for highest severity inpatient stays. (MS-DRG 870)