HPR18

DOES DRG PAYMENT UNDER A GLOBAL BUDGET WITH PRICE ADJUSTMENT END THE MEDICAL ARMS RACE?

EVIDENCE FROM HOSPITAL CARE PROVISION IN CHINA

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BACKGROUND

In 2020, China launched the nationwide China Healthcare Security-Diagnosis Related Group (CHS-DRG) system as a cornerstone of value-based provider payment reform.

OBJECTIVES

To examine how the CHS-DRG framework, implemented in city A under a global budget with price adjustment, reshaped hospital care provision amid persistent concerns over the traditional Medical Arms Race (MAR).

METHODS

Program features & theoretical incentives

We extended a physician utility framework to theorize provider responses to DRG incentives under budget constraints.

$$U = \pi(q_{H'}, p_{H'}, s_O\ v_O\ c_H) + \alpha R(q_{H'}\ w)$$

- **Hypothesis 1.** In the short term, DRG-based payment reform under a global budget with price adjustments in city A **creates incentives to reduce inpatient admissions**.
- **Hypothesis 2.** In the short term, DRG-based payment reform under a global budget with price adjustments in city A **encourages hospitals to increase the average case-mix of admitted patients**.
- **Hypothesis 3.** In the short term, DRG-based payment reform under a global budget with price adjustments in city A may lead to a decrease in average per-admission costs, potentially through **lower care intensity or the substitution of lower-cost products**.

Study design

We constructed a counterfactual scenario representing the level of care provision that would have been observed in pilot hospitals (intervention group) had the DRG system not been introduced.

The reform was implemented on November 1, 2021. Accordingly, November 2020-October 2021 was defined as the pre-program period, and November 2021-September 2022 as the post-program period.

Data sources

The analysis draws on two data sources.

- The first is a comprehensive claims dataset from the Urban Employee Basic Medical Insurance (UEBMI) and Urban and Rural Resident Basic Medical Insurance (URRBMI) schemes in city A.
- The other is official government documentation identifying pilot hospitals.

Empirical strategy

The reform effect was estimated using a DID framework:

$$g(Y_{iht}) = \alpha + \beta_1 Policy + \beta_2 (Policy \times Post) + \gamma X_{ih} + Month_t + \varepsilon_{iht} \quad (1)$$

- We employed **generalized linear models (GLMs)** for case-level, and **generalized estimating equations (GEEs)** for data aggregated at the hospital-month level.
- **Parallel-trends assumption** was assessed indirectly by comparing pre-program dynamics between the two groups by an event-study design.

Fig. 1 Event-Study Estimates of Monthly Differences Between Intervention and Control Groups

Outcome measures

Table 1 Definitions and construction of variables

Conceptual Framework	Outcome Measures
Volume of care provision	
Quantity	Monthly admissions per hospital Monthly patients per hospital Admissions per patient Monthly outpatient visits per hospital Monthly unique outpatients per hospital Outpatient visits per patient Monthly point volume per hospital
Intensity	The number of orders for medications The number of orders for materials/devices The number of orders for examinations DRG relative weight per admission The proportion of patients receiving surgery Per-visit number of medication orders Per-visit number of material or device orders Per-visit number of examination orders
Efficiency of care provision	
Direct	Length of stay Monthly number of day-case per hospital The proportion of day-case admissions The share of day-case surgeries among all surgical procedures
Indirect	The same-day readmission rate at the same hospital for the same condition The proportion of admissions involving diagnostic testing only The utilization rate of low-value drugs

RESULTS

Impact on MAR-related volume and intensity of care provision

Table 2 DID Estimates on Care Volume and Intensity

Primary Outcomes	Adjusted Difference-in-Differences Effects	95% CI	P value
Quantity			
Monthly admissions per hospital	-271 (-10.90%)	-492, -49 (-18.75%, -3.05%)	0.006
Monthly patients per hospital	-238 (-10.37%)	-442, -34 (-18.27%, -2.48%)	0.010
Admissions per patient	0.03 (2.58%)	-0.06, 0.11 (-5.68%, 10.84%)	0.530
Monthly points per hospital	-0.56 (-1.87%)	-3.04, 1.92 (-10.05%, 6.31%)	0.654
Case-mix			
DRG relative weight per admission	0.06 (3.21%)	0.04, 0.07 (2.37%, 4.05%)	<0.001
The proportion of patients undergoing surgery, %	2.32 (5.99%)	2.00, 2.64 (5.14%, 6.8%)	<0.001
Intensity			
The number of orders for medications	0.61 (2.63%)	0.49 0.73 (2.11%, 3.15%)	<0.001
The number of orders for materials/devices	0.54 (2.23%)	0.42, 0.67 (1.70%, 2.76%)	<0.001
The number of orders for examinations	0.43 (0.62%)	0.20, 0.66 (0.28, 0.96%)	<0.001

- Care substitution was absent in volume but evident in intensity (Fig. 2).

Impact on MAR-related efficiency of care provision

Table 3 DID Estimates on Care Efficiency

Primary Outcomes	Adjusted Difference-in-Differences Effects	95% CI	P value
Direct			
Length of stay, days	0.07 (1.05%)	0.03, 0.12 (0.36%, 1.74%)	0.003
Monthly number of day-case per hospital	-39 (-22.27%)	-120, 41 (-48.67%, 4.13%)	0.098
Indirect			
The same-day readmission at the same hospital for the same condition, %	-0.04 (-9.44%)	-0.08, -0.00 (-17.85%, -1.02%)	0.028
Proportion of cases involving diagnostic testing only, %	-1.59 (-24.76%)	-1.86, -1.33 (-28.54%, -20.98%)	<0.001
Utilization rate of low-value drugs, %	-1.90 (-53.20%)	-2.05, -1.75 (-56.34%, -50.07%)	<0.001

CONCLUSION

This blended DRG program **partially mitigated** the competitive impulse of MAR, shifting the focus from volume expansion to per-case intensity while disabling its financial transmission mechanism.

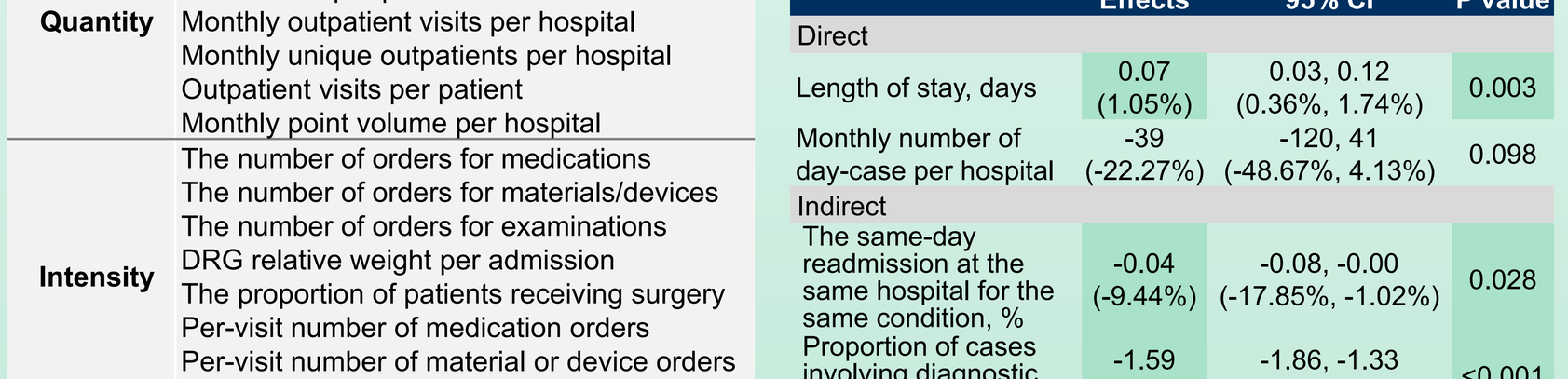

Fig. 2 Spillover Effects of DRG: Testing Whether MAR-Related Pressure Shifted from Inpatient to Outpatient Care