

How do hospitals respond to managed care? Evidence from at-risk newborns

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Policy Change

New York State rolled out mandatory enrollment for Medicaid beneficiaries in Medicaid Managed Care between October 1997 and November 2012 for newborns weighing more than 1200 grams.

Data Availability

- State Inpatient Databases (SID) of Healthcare Cost and Utilization Project (HCUP)
- American Hospital Association (AHA) Annual Survey of Hospitals

Research Question

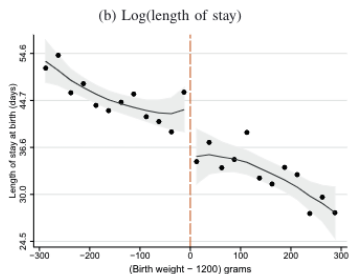
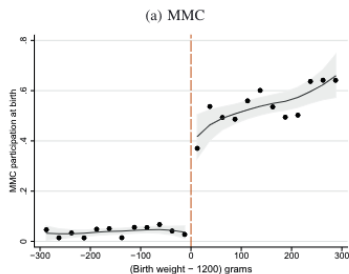
Does MMC change hospital practice patterns and patient outcomes?

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- Steering
- Treatment Intensity:
 - total cost
 - total charges
 - length of stay

Contribution

- Evidence that MMC can achieve meaningful savings through steering.
- Improvement on existing literature using Regression Discontinuity Design (RDD).



Preview of Findings

- Evidence that transfers move infants from high-cost to lower-cost hospitals on average. (Teaching Hospitals that are lower cost but similar quality)
- There is no compelling evidence that MMC affect patient health as measured by readmission and in-hospital mortality.
- The effects in NYC are not the same as the rest of the state.

SIDs by HCUP

The SID contain more than 100 clinical and nonclinical variables such as:

- Principal and secondary diagnoses and procedures
- Admission and discharge status
- Patient demographics characteristics
- Expected payment source
- Total charges
- Length of stay

AHA

Hospital characteristics

- Hospital's payoff under FFS:

$$U_{FFS}(q) = \pi_h(q) + B_h(q) \quad (1)$$

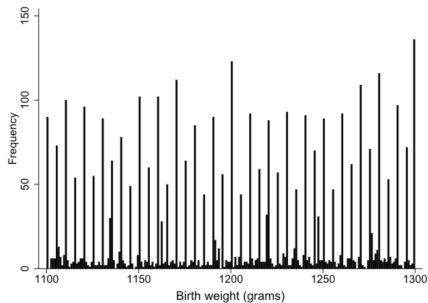
- Hospital's payoff under MMC:

$$U_{MMC}(q) = \pi_h(q) + B_h(q) + \lambda(R_p - C_p(q) + B_p(q)) \quad (2)$$

- Hospitals provide a lower level of inpatient services to MMC infants than FFS infants.
- Lower level of inpatient care has ambiguous effect on benefits to patients because health plans places a non-zero weight on benefits to its enrollees.

$$Y_i = \alpha + \beta D_i + F(X_i) + \phi_y + \psi_m + \eta_c + u_i \quad (3)$$

(a) Frequency at each gram



(b) Mean frequency at each 25-g bin

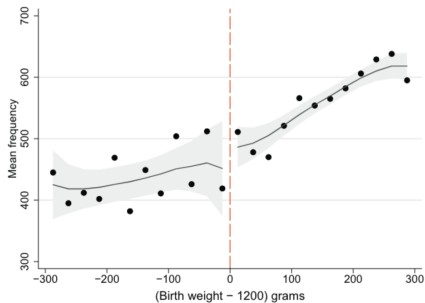


Table 2
Effects of birth weight ≥ 1200 g on discharge outcomes, New York City.

	(1)	(2)	(3)	(4)	(5)	(6)
	MMC	Log (LOS)	Log (total charges)	Log (total costs)	Transfer	In-hospital mortality
<i>Panel A. Hospital care and infant health at birth</i>						
Above 1200 g	0.369*** (0.034)	-0.144** (0.071)	-0.195** (0.093)	-0.337*** (0.105)	0.036* (0.020)	0.020 (0.016)
Observations	1937	1937	1937	1375	1937	1937
Mean below 1200 g	0.045	50.8	235,738	96,680	0.077	0.040
	MMC	Log (LOS)	Log (total charges)	Log (total costs)	Readmission	In-hospital mortality (1-year)
<i>Panel B. Total hospital care and infant health during the first six months</i>						
Above 1200 g	0.393*** (0.034)	-0.039 (0.075)	-0.067 (0.094)	-0.220 (0.112)	0.037 (0.033)	0.027 (0.016)
Observations	1937	1937	1937	1338	1937	1937
Mean below 1200 g	0.055	54.8	253,077	103,490	0.203	0.048

Notes: In addition to the indicator for birth weight ≥ 1200 g, each regression includes a linear spline of birth weight, admission year fixed effects, admission month fixed effects, and hospital county fixed effects. The means of variables measured in logs are reported in exponentiated values. Clustered standard errors at the birth weight level are reported in parentheses. *P*-values are adjusted for multiple hypothesis testing.

- * Significant at 10%.
- ** significant at 5%.
- *** significant at 1%.

Table 5
Effects of birth weight ≥ 1200 g on discharge outcomes, New York State.

	(1)	(2)	(3)	(4)	(5)	(6)
	MMC	Log (LOS)	Log (total charges)	Log (total costs)	Transfer	In-hospital mortality
<i>Panel A: Hospital care and infant health at birth</i>						
Above 1200 g	0.361*** (0.028)	-0.065 (0.055)	-0.091 (0.071)	-0.161* (0.075)	0.024 (0.019)	0.021* (0.010)
Observations	3142	3142	3142	2545	3142	3142
Mean below 1200 g	0.057	49.9	228,785	89,290	0.116	0.040
	MMC	Log (LOS)	Log (total charges)	Log (total costs)	Readmission	In-hospital mortality (1-year)
<i>Panel B: Total hospital care and infant health during the first six months</i>						
Above 1200 g	0.375*** (0.030)	-0.002 (0.055)	-0.010 (0.068)	-0.092 (0.075)	0.023 (0.029)	0.026** (0.011)
Observations	3142	3142	3142	2503	3142	3142
Mean below 1200 g	0.071	53.9	246,017	95,660	0.187	0.045

Notes: In addition to the indicator for birth weight ≥ 1200 g, each regression includes a linear spline of birth weight, admission year fixed effects, admission month fixed effects, and hospital county fixed effects. The means of variables measured in logs are reported in exponentiated values. Clustered standard errors at the birth weight level are reported in parentheses. P-values are adjusted for multiple hypothesis testing.

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Robustness Checks

- Difference-in-Difference:

$$Y_{ict} = \lambda_c + \gamma_t + \delta D_{ct} + \theta_{ct} + \epsilon_{ict} \quad (4)$$

Table 8
Difference-in-differences estimates, New York State.

	(1)	(2)	(3)	(4)	(5)	(6)
	MMC	Log (LOS)	Log (total charges)	Log (total costs)	Transfer	In-hospital mortality
<i>Panel A. Without county-specific time trends</i>						
MMC mandate	0.262*** (0.030)	-0.009 (0.006)	-0.069* (0.033)	-0.131*** (0.031)	0.000 (0.001)	0.000 (0.000)
Observations	1,757,025	1,755,120	1,754,741	1,016,271	1,485,570	1,757,018
Mean	0.425	4.2	8,747	4,235	0.012	0.004
<i>Panel B. With county-specific time trends</i>						
MMC mandate	0.189*** (0.024)	0.011** (0.005)	-0.050* (0.024)	-0.104*** (0.038)	-0.002* (0.001)	0.000 (0.000)
Observations	1,757,025	1,755,120	1,754,741	1,016,271	1,485,570	1,757,018
Mean	0.425	4.2	8,747	4,235	0.012	0.004

Notes: Panel A presents difference-in-differences estimates for each outcome without including the county-specific trends. Panel B shows the difference-in-differences estimates including the county-specific trends. The means of variables measured in logs are reported in exponentiated values. Standard errors clustered at the county level are in parentheses. P-values are adjusted for multiple hypothesis testing.

* Significant at 10%.

** significant at 5%.

*** significant at 1%.