

Is More Information Better? The Effects of "Report Cards" on Health Care Providers

David Dranove et al.

Jung Jae Kim

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- **"Report cards"**: provide information about the performance.
- Debate on the merits of report cards
- Supporters: Patients can identify the best physicians and hospitals.
- Skeptics: Providers select healthier patients to improve their ranking.
 - (1) Asymmetric information
 - (2) The significant difference in outcomes
 - (3) The utility loss from a few bad outcomes

Research objective: Assessing the competing claims about report card.

1. The matching of patients to providers.
2. The incidence and quantity of CABG surgeries.
3. The incidence and quantity of complementary and substitute treatments.

Preview of the Main Results

- Improved matching of patients with hospitals
- Increased the quantity of CABG surgery.
- Changed its incidence from sicker patients toward healthier patients.
- Overall, this led to higher costs and a deterioration of outcomes.

History of health care report cards

- Two "treatment" states:
Only NY and PA reported outcomes for patients receiving CABG
- Beginning in 1990, NY released raw and risk-adjusted CABG mortality.
- Beginning in November 1992, PA published data on risk-adjusted CABG mortality.
- Report cards could have begun to affect decision making in NY in 1991 and PA in 1993.

Empirical Models

A. Hospital-Level Analysis

$$\ln(h_{lst}) = \mathbf{A}_s + \mathbf{B}_t + g \cdot \mathbf{Z}_{lst} + p \cdot L_{st} + q \cdot N_{st} + e_{lst}, \quad (1)$$

h_{lst} : mean of the illness severity before treatment of hospital l

\mathbf{A}_s : State fixed effects

\mathbf{B}_t : Time fixed effects

\mathbf{Z}_{lst} : Hospital Characteristics

L_{st} : 1 if the hospital is in treatment groups

N_{st} : The number of hospitals, and its square and cube

- If $p < 0$, then report cards caused a shift in incidence from sicker to healthier patients.
- Reestimate equation (1) for AMI patients who are not subject to selection.
- Reestimate equation (1) using the within-hospital coefficient of variations; an estimated $p < 0$ is consistent with improved patient sorting.

B. Patient-Level Analysis

$$C_{kst} = \mathbf{A}_s + \mathbf{B}_t + g \cdot \mathbf{Z}_{kst} + p \cdot L_{st} + e_{kst} \quad (2)$$

C_{kst} : 1 if patient k received CABG within one year of admission for AMI

\mathbf{A}_s : State fixed effects

\mathbf{B}_t : Time fixed effects

\mathbf{Z}_{kst} : Patient Characteristics

L_{st} : 1 if patient k 's residence is in treatment groups

- If $p > 0$, then report cards increased the probability that an AMI patient receives CABG.
- Reestimate (2) for alternative treatments PTCA and cath.

B. *Patient-Level Analysis*

- Let O_{kst} be one if patient k experienced an adverse health outcome.
Reestimate (2) with O_{kst} .
- Let y_{kst} be his total hospital expenditure after admission with AMI.
Reestimate (2) with $\ln(y_{kst})$.
- If report cards uniformly decrease adverse outcomes and decrease costs, then we conclude their effect on social welfare is positive.

- Medicare claims data from 1987 to 1994.
- As a measure of the patient's illness severity before treatment, total inpatient hospital expenditures for the year prior to admission are used.
- As a measure of the intensity of treatment, total inpatient hospital expenditures in the year after admission are used.
- Data on U.S. hospital characteristics are from American Hospital Association.

Hospital-Level Analysis

TABLE 2
EFFECTS OF REPORT CARDS ON THE WITHIN-HOSPITAL COEFFICIENT OF VARIATION AND MEAN OF PATIENTS' HEALTH STATUS BEFORE TREATMENT: MEDICARE BENEFICIARIES WITH AMI AND MEDICARE BENEFICIARIES RECEIVING CABG, 1987-94

DEPENDENT VARIABLE	BENEFICIARIES RECEIVING CABG		BENEFICIARIES WITH AMI	
	Assumes Report Cards Effective 1991 in N.Y. and 1993 in Pa. (1)	Assumes Report Cards Effective 1993 in N.Y. and Pa. (2)	Assumes Report Cards Effective 1991 in N.Y. and 1993 in Pa. (3)	Assumes Report Cards Effective 1993 in N.Y. and Pa. (4)
ln(mean of patients' total hospital expenditures one year prior to admission)	-3.92** (1.52)	-5.30** (1.10)	3.37** (1.52)	1.55 (2.26)
ln(mean of patients' total days in hospital one year prior to admission)	-3.74** (1.84)	-4.51** (1.54)	1.11 (2.76)	1.56 (2.95)
ln(CV of patients' total hospital expenditures one year prior to admission)	3.00** (1.39)	3.60** (1.77)	-2.32** (.64)	-2.43** (.66)
ln(CV of patients' total days in hospital one year prior to admission)	.94 (2.22)	2.74 (3.53)	-4.79** (1.79)	-4.98** (2.01)

NOTE.—Each table entry represents a separate model. Standard errors are based on an estimator of the variance-covariance matrix that is consistent in the presence of heteroscedasticity and of any correlation of regression errors within states over time. Coefficients and standard errors are multiplied by 100 to facilitate interpretation. Each observation is weighted by the number of patients admitted to the hospital in the cohort in question. Sample sizes: for AMI patients, coefficient of variation of expenditures, 37,672; coefficient of variation of length of stay, 37,681; mean expenditures, 38,066; mean of length of stay, 38,084. Regressions also include controls for number of hospitals in state of residence.

** Significantly different from zero at the 5 percent level.

Patient-Level Analysis

TABLE 4
EFFECTS OF REPORT CARDS ON CABG, PTCA, AND CATHETERIZATION RATES: MEDICARE BENEFICIARIES WITH AMI, 1987-94

DEPENDENT VARIABLE	A. ASSUMES REPORT CARDS EFFECTIVE 1991 IN N.Y. AND 1993 IN PA.			B. ASSUMES REPORT CARDS EFFECTIVE 1993 IN N.Y. AND PA.		
	Effect of Report Cards (1)	Admission to Hospital in Year before AMI (2)	Report Cards × Prior Year Admission (3)	Effect of Report Cards (4)	Admission to Hospital in Year before AMI (5)	Report Cards × Prior Year Admission (6)
CABG within one year of admission (1 = yes) [14.76, 9.10] ^a	.60** (.21)			.91** (.44)		
	.81** (.15)	-3.80** (.15)	-.65 (.44)	1.39** (.42)	-3.78** (.16)	-1.52** (.19)
CABG within one day of admission (1 = yes) [5.40, 2.97]	-.78** (.29)			-.59** (.23)		
	-.97** (.40)	-1.73** (.13)	.72* (.41)	-.66** (.30)	-1.71** (.14)	.29 (.30)
PTCA within one year of admission (1 = yes) [13.94, 8.76]	-1.69 (1.22)			-1.22 (1.17)		
	-1.73 (1.55)	-3.50** (.17)	.23 (1.15)	-.96 (1.46)	-3.46** (.19)	-.76 (.99)
PTCA within one day of admission (1 = yes) [7.81, 4.82]	-2.21** (.85)			-2.06** (.91)		
	-2.55** (1.05)	-2.05** (.16)	1.22* (.70)	-2.22** (1.07)	-2.00** (.18)	.59 (.57)
Cath within one year of admission (1 = yes) [40.65, 26.77]	-.81 (1.02)			.24 (.56)		
	-.88 (1.48)	-9.55** (.34)	.48 (1.64)	.72 (.89)	-9.47** (.38)	-1.37 (1.16)
Cath within one day of admission (1 = yes) [26.81, 16.25]	-3.75** (1.51)			-2.77** (1.17)		
	-4.28** (1.90)	-7.54** (.38)	2.02 (1.40)	-2.86* (1.46)	-7.45** (.41)	.56 (1.08)

NOTE.—Standard errors are based on an estimator of the variance-covariance matrix that is consistent in the presence of heteroscedasticity and of any correlation of regression errors within states over time. Coefficients and standard errors are multiplied by 100 to facilitate interpretation. For expenditure models, $N = 1,768,585$; for all other models, $N = 1,770,452$.

^a Numbers in brackets are the means for individuals without and with a prior year hospital admission.

* Significantly different from zero at the 10 percent level.

** Significantly different from zero at the 5 percent level.

Patient-Level Analysis

TABLE 5
EFFECTS OF REPORT CARDS ON HOSPITAL EXPENDITURES AND HEALTH OUTCOMES: MEDICARE BENEFICIARIES WITH AMI, 1987-94

DEPENDENT VARIABLE	A. ASSUMES REPORT CARDS EFFECTIVE 1991 IN N.Y. AND 1993 IN PA.			B. ASSUMES REPORT CARDS EFFECTIVE 1993 IN N.Y. AND PA.		
	Effect of Report Cards (1)	Admission to Hospital in Year before AMI (2)	Report Cards × Prior Year Admission (3)	Effect of Report Cards (4)	Admission to Hospital in Year before AMI (5)	Report Cards × Prior Year Admission (6)
ln(total hospital expenditures in year after admission)	3.92** (1.08)			3.95** (1.52)		
	2.89** (.73)	7.33** (.48)	3.35* (1.75)	3.31** (1.16)	7.44** (.53)	1.93 (1.49)
Readmission with AMI within one year of admission (1=yes)	.02 (.08)			.06 (.07)		
	-.15 (.10)	1.70** (.06)	.55** (.13)	-.11 (.09)	1.72** (.06)	.52** (.14)
Readmission with heart failure within one year of admission (1=yes)	.50** (.10)			.54** (.10)		
	-.20** (.08)	4.89** (.10)	2.27** (.26)	-.18** (.08)	4.93** (.11)	2.30** (.36)
Mortality within one year of admission (1=yes)	.45 (.32)			.45* (.26)		
	.37 (.41)	11.90** (.09)	-.02 (.44)	.13 (.27)	11.88** (.10)	.69** (.13)

NOTE.—Standard errors are based on an estimator of the variance-covariance matrix that is consistent in the presence of heteroscedasticity and of any correlation of regression errors within states over time. Coefficients and standard errors are multiplied by 100 to facilitate interpretation. For expenditure models, $N = 1,768,585$; for all other models, $N = 1,770,452$.

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** Significantly different from zero at the 5 percent level.

Conclusion

1. CABG surgery report cards led to substantial selection by providers.
2. Report cards led to increased sorting of patients to providers.
3. Report cards reduced the measure of welfare, higher levels of Medicare hospital expenditures and greater rates of adverse health outcomes.

Cautions

- (1) Measure only short-run responses.
- (2) The results do not imply that report cards are harmful in general.
- (3) Report cards and the incentives they create are not unique to health care.