Quality Information and Provider Choice

Evidence from Dranove et al. (2003)

Overview

- Question: Is the publication of information on health outcomes achieved by physicians and hospitals (i.e. report cards) constructive or harmful?

- Assess the effects by testing for three potential effects
  - Matching of patients to providers
  - Incidence and quantity of CABG surgeries
  - Incidence and quantity of complementary and substitute treatments
- Provide welfare analysis by looking changes in costs vs changes in outcomes

Data

- Two main sources:

  - Longitudinal Medicare claims data for patients admitted with new primary diagnosis of AMI of for CABG surgery from 1987-1994

  - AHA survey – hospital characteristics

Empirical Models (Hospital Level)

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

- h_{lst}: mean of illness severity before admission or treatment of hospital l's Medicare CABG patients
- L_{st}: treated indicator
- p: effect of report cards on severity of patients receiving CABG

Empirical Models (Patient Level)

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

$$\ln_{C_{kst}, O_{kst}} (y_{kst}) = \mathbf{A}_s + \mathbf{B}_t + g \cdot \mathbf{Z}_{kst} + p \cdot L_{st} + q \cdot w_{kst}$$
$$+ r \cdot L_{st} \cdot w_{kst} + e_{kst},$$

- C_{kst}: CABG surgery within year of admission for AMI
- O_{kst}: adverse health outcome within year of admission for AMI
- y_{kst}: total hospital expenditure within year of admission for AMI

- w_{kst}: measure increasing in patient k's severity

TABLE 1

MEAN EXPENDITURES IN YEAR PRIOR TO ADMISSION FOR AMI OR FOR CABG SURGERY,
ELDERLY MEDICARE BENEFICIARIES, 1990 AND 1994

	1990 (1)	1994 (2)	Percentage Change (3)
	A. All AMI Patients		
N.Y. and Pa.	$3,110	$3,373	.0846
All other states	2,660	2,910	.0940
Conn., Md., and N.J. only	3,055	3,318	.0861
	B. All Patients Receiving CABG within One Year of Admission		
N.Y. and Pa.	4,850	4,511	−.0699
All other states	3,657	3,660	.0008
Conn., Md., and N.J. only	5,015	4,934	−.0162
	C. AMI Patients Receiving CABG within One Year of Admission		
N.Y. and Pa.	1,867	1,702	−.0883
All other states	1,537	1,585	.0312
Conn., Md., and N.J. only	1,911	1,859	−.0272

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)

TABLE 3

EFFECTS OF REPORT CARDS FOR TEACHING AND ALL OTHER HOSPITALS ON THE 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	
	Report Cards Effective 1991 in N.Y. and 1993 in Pa. (1)	(Report Card Effective 1991 in N.Y. and 1993 in Pa.) × Teaching Hospital (2)	Report Cards Effective 1991 in N.Y. and 1993 in Pa. (3)	(Report Card Effective 1991 in N.Y. and 1993 in Pa.) × Teaching Hospital (4)
ln(mean of patients' total hospital expenditures one year prior to admission)	−18.63** (2.42)	19.78** (2.20)	−1.78 (3.95)	15.05** (7.46)
ln(mean of patients' total days in hospital one year prior to admission)	−11.38** (3.03)	10.28** (1.70)	−2.06 (4.89)	9.27 (6.11)

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	.60**			.91**		
(1=yes)	(.21)			(.44)		
[14.76, 9.10][a]	.81**	−3.80**	−.65	1.39**	−3.78**	−1.52**
	(.15)	(.15)	(.44)	(.42)	(.16)	(.19)
CABG within one day of admission	−.78**			−.59**		
(1=yes)	(.29)			(.23)		
[5.40, 2.97]	−.97**	−1.73**	.72*	−.66**	−1.71**	.29
	(.40)	(.13)	(.41)	(.30)	(.14)	(.30)
PTCA within one year of admission	−1.69			−1.22		
(1=yes)	(1.22)			(1.17)		
[13.94, 8.76]	−1.73	−3.50**	.23	−.96	−3.46**	−.76
	(1.55)	(.17)	(1.15)	(1.46)	(.19)	(.99)
PTCA within one day of admission	−2.21**			−2.06**		
(1=yes)	(.85)			(.91)		
[7.81, 4.82]	−2.55**	−2.05**	1.22*	−2.22**	−2.00**	.59
	(1.05)	(.16)	(.70)	(1.07)	(.18)	(.57)
Cath within one year of admission	−.81			.24		
(1=yes)	(1.02)			(.56)		
[40.65, 26.77]	−.88	−9.55**	.48	.72	−9.47**	−1.37
	(1.48)	(.34)	(1.64)	(.89)	(.38)	(1.16)
Cath within one day of admission	−3.75**			−2.77**		
(1=yes)	(1.51)			(1.17)		
[26.81, 16.25]	−4.28**	−7.54**	2.02	−2.86*	−7.45**	.56
	(1.90)	(.38)	(1.40)	(1.46)	(.41)	(1.08)

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**			3.95**		
	(1.08)			(1.52)		
	2.89**	7.33**	3.35*	3.31**	7.44**	1.93
	(.73)	(.48)	(1.75)	(1.16)	(.53)	(1.49)
Readmission with AMI within one year of admission (1=yes)	.02			.06		
	(.08)			(.07)		
	−.15	1.70**	.55**	−.11	1.72**	.52**
	(.10)	(.06)	(.13)	(.09)	(.06)	(.14)
Readmission with heart failure within one year of admission (1=yes)	.50**			.54**		
	(.10)			(.10)		
	−.20**	4.89**	2.27**	−.18**	4.93**	2.30**
	(.08)	(.10)	(.26)	(.08)	(.11)	(.36)
Mortality within one year of admission (1=yes)	.45			.45*		
	(.32)			(.26)		
	.37	11.90**	−.02	.13	11.88**	.69**
	(.41)	(.09)	(.44)	(.27)	(.10)	(.13)

Conclusions

- CABG report cards led to substantial selection by providers.
- Report cards led to increased sorting of patients to providers based on severity.
- Report cards reduced welfare, particularly for patients with higher severity.

- Discussion questions:
  - Previous literature has found positive effects on mortality resulting from report cards in this setting. What might explain this inconsistency?
  - How might incentives be adjusted so that report cards are beneficial in this setting?

TABLE 6

ALTERNATIVE MODELS OF EFFECTS OF REPORT CARDS ON CABG SURGERY RATES, HOSPITAL EXPENDITURES, AND HEALTH OUTCOMES OF INDIVIDUAL MEDICARE BENEFICIARIES WITH AMI, 1987–94

DEPENDENT VARIABLE	A. HOSPITALS AND PATIENTS FROM N.Y., PA., CONN., MD., AND N.J. ONLY			B. LINEAR TIME TREND INCLUDED FOR 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)	.42			.27**		
	(.36)			(.10)		
	.98**	−2.66**	−1.94**	.46**	−3.80**	−.65
	(.31)	(.41)	(.22)	(.18)	(.15)	(.44)
PTCA within one year of admission (1=yes)	−.93			.10		
	(.96)			(.65)		
	−.50	−2.11**	−1.50	.03	−3.50**	.23
	(1.24)	(.44)	(.90)	(1.00)	(.17)	(1.15)
Cath within one day of admission (1=yes)	−.76			.70		
	(1.82)			(1.23)		
	−.22	−4.63**	−1.87	.10	−7.54**	2.01
	(2.12)	(.61)	(1.15)	(1.62)	(.38)	(1.40)
ln(total hospital expenditures in year after admission)	1.74			3.49		
	(1.19)			(2.81)		
	1.96	10.81**	−.62	2.52	7.33**	3.36*
	(1.40)	(.97)	(1.83)	(3.23)	(.48)	(1.75)
Readmission with AMI within one year of admission (1=yes)	.17			−.23**		
	(.09)			(.07)		
	.07	1.90**	.35	−.38**	1.70**	.55**
	(.11)	(.12)	(.21)	(.07)	(.06)	(.13)
Readmission with heart failure within one year of admission (1=yes)	.41**			.01		
	(.09)			(.10)		
	−.04	5.52**	1.57**	−.64**	4.89**	2.27**
	(.12)	(.15)	(.36)	(.12)	(.10)	(.26)
Mortality within one year of admission (1=yes)	.44*			.10		
	(.16)			(.30)		
	.51	12.05**	−.11	.13	11.90**	−.02
	(.25)	(.23)	(.41)	(.45)	(.09)	(.44)

TABLE 7
EFFECTS OF REPORT CARDS ON TOTAL HOSPITAL EXPENDITURES AND HEALTH OUTCOMES OF INDIVIDUAL MEDICARE BENEFICIARIES RECEIVING CABG SURGERY, 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)	8.28** (3.30)			5.93** (2.67)		
	7.08** (3.42)	2.48** (.39)	2.72** (.80)	4.78** (2.68)	2.52** (.37)	2.80** (.73)
Readmission with AMI within one year of admission (1=yes)	−.10* (.05)			−.17** (.04)		
	−.15** (.04)	.22** (.02)	.10 (.09)	−.17** (.06)	.23** (.02)	.00 (.09)
Readmission with heart failure within one year of admission (1=yes)	.14 (.18)			.31** (.14)		
	−.01 (.11)	3.47** (.07)	.42 (.49)	.02 (.14)	3.46** (.07)	.86* (.46)
Mortality within one year of admission (1=yes)	−1.17** (.28)			−1.02** (.38)		
	−1.02** (.32)	2.72** (.16)	−.24 (.23)	−.86* (.46)	2.72** (.16)	−.21 (.25)