Can report cards improve cardiovascular care? Lessons from Ontario

Cardiovascular & Diagnostic Imaging Research Program

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Objectives

1) To discuss our experiences in developing public report cards for improving cardiac care in Ontario, Canada (cardiac surgery, heart attack and heart failure care).

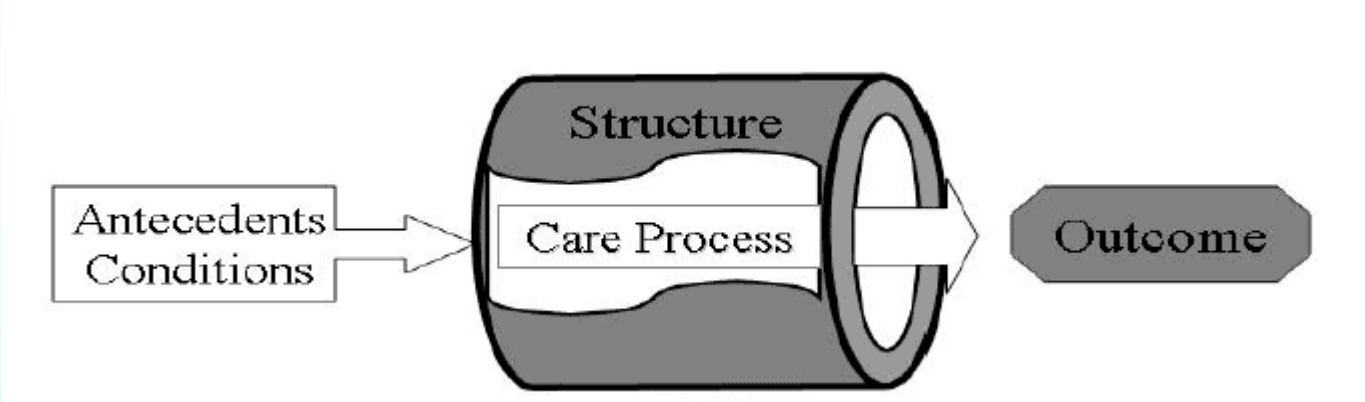
2) To discuss where we have had an impact and lessons we have learned that may assist future report card initiatives.

Health care report cards

- Designed to evaluate performance of the health care system
- May be at a national, provincial, regional, institution or provider level
- Report on quality or performance indicators
- Cardiac diseases have been at the forefront of this issue
  - Common diseases
  - Measurable outcomes (death), available data
  - Funding issues
  - Public/media interest

Donabedian quality of care framework

- **Structure:** the attributes of settings where care is delivered
- **Process:** whether or not good medical/healthcare practices are followed
- **Outcome:** impact of the care on health status

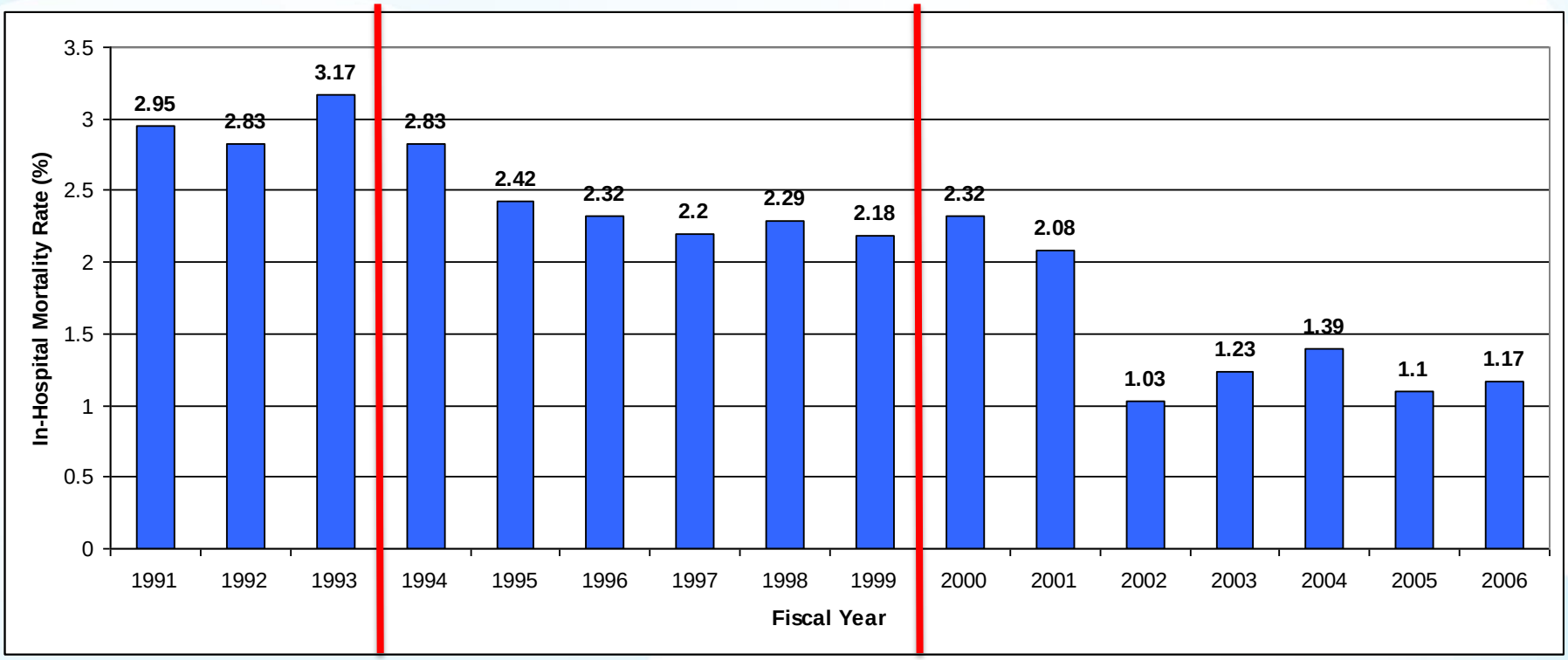


http://www.ahrq.gov/research/findings/final-reports/medteam/figure2.html

CABG surgery report cards in Ontario

- Modeled after New York State's Cardiac Surgery Reporting System (first US cardiac report card)
- Produced by ICES in collaboration with CCN (Cardiac Care Network of Ontario) biannually since 1993
  - Utilize CCN clinical database linked to ICES administrative database
  - Risk-adjustment methods extensively tested and published in the medical literature
- Results shared with hospital CEOs, Chiefs of Cardiac surgery and surgeons at each institution
- Hospital results first publicly released in 1999

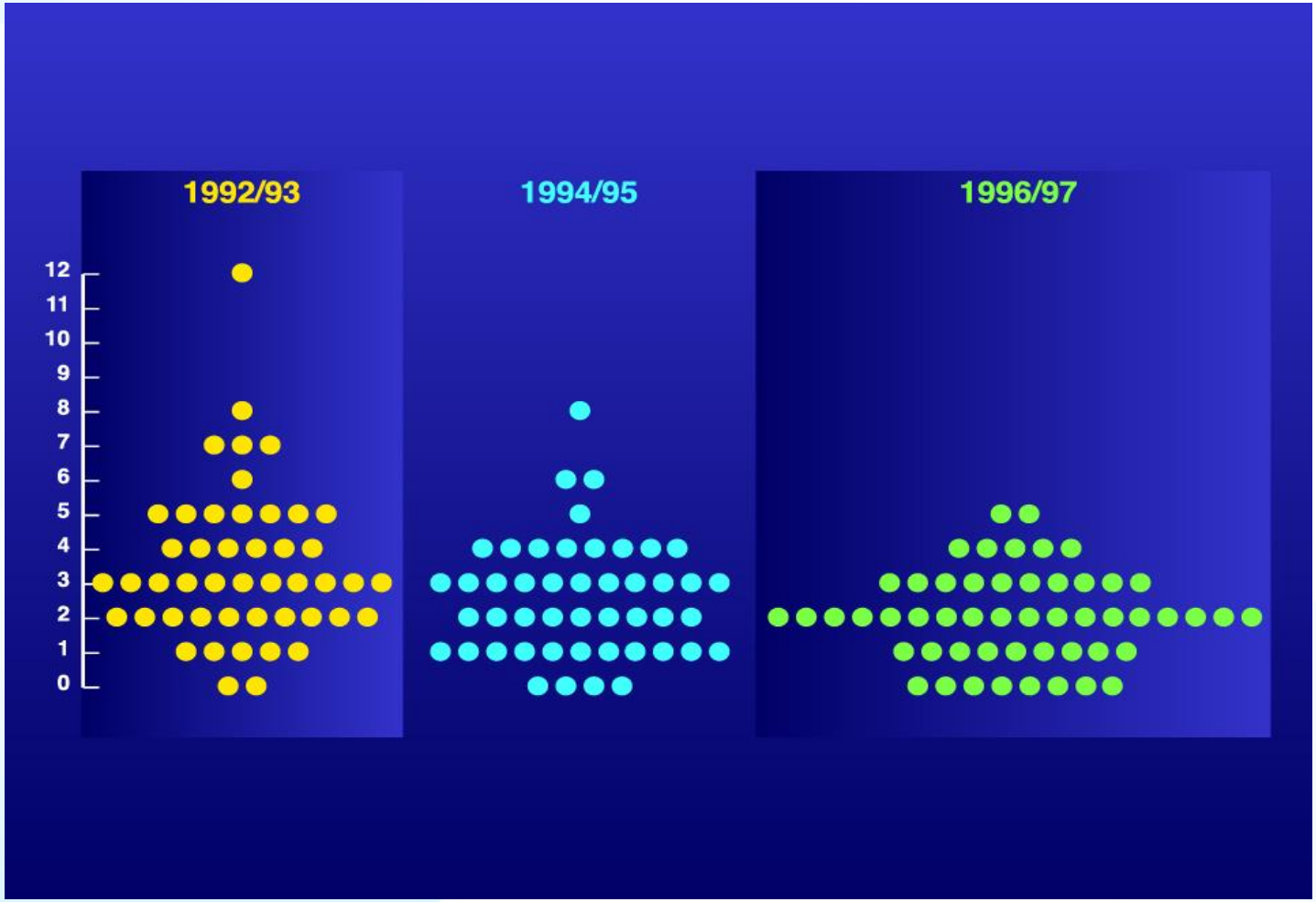
Trends in in-hospital mortality rates after isolated CABG surgery in Ontario 1991-2006



Confidential reporting

Public reporting

Risk-adjusted 30-day CABG mortality rates by cardiac surgeon in Ontario



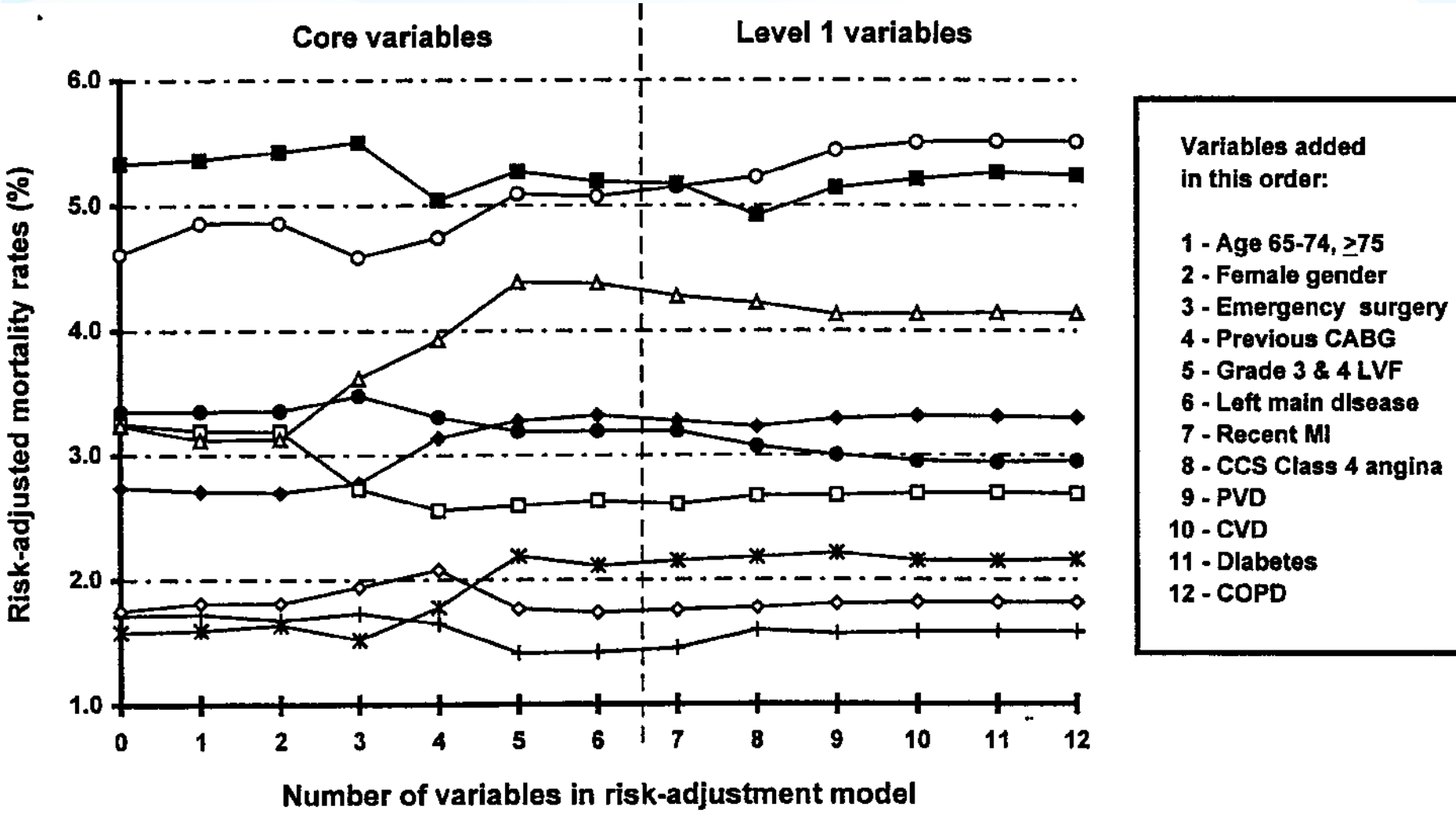
Risk adjustment (to take into account case-mix differences)

- Observed rate = $\frac{\text{Count of discharges of interest}}{\text{Count of discharges in the population at risk}}$
- Expected rate = $\frac{\text{Sum of the predicted rate for each discharge}}{\text{Count of discharges in the population at risk}}$
- Use logistic regression to calculate the predicted rate
- Risk-adjusted mortality rate =

(Observed Rate / Expected Rate) x Reference population average rate

Impact of more risk factors included in a Risk – Adjustment Model

Tu JV et al. JACC; 30:1317, 1997

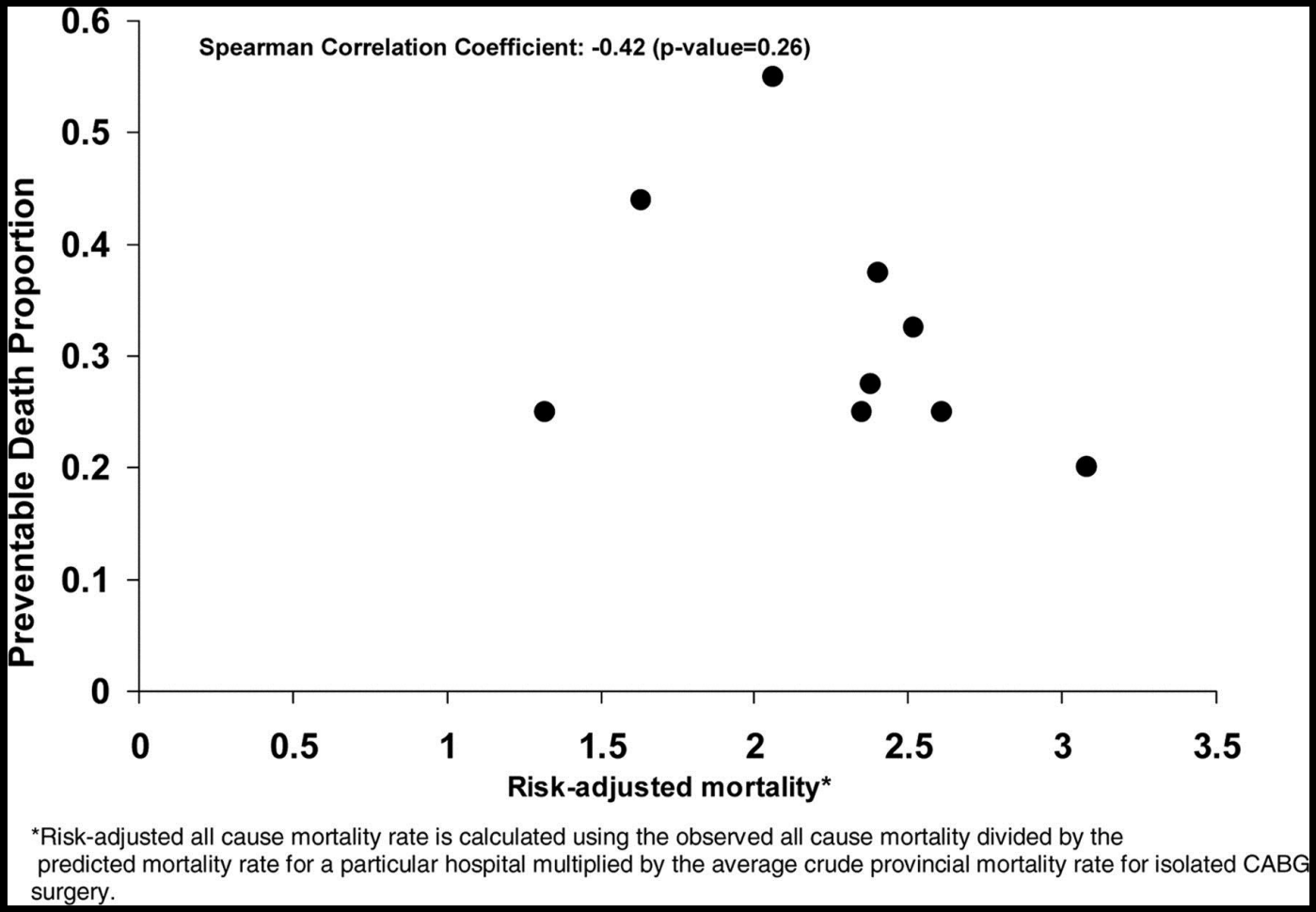


Examples of responses from hospitals/surgeons

- High-outlier surgeons lost surgical privileges/retired
- Triaging of high-risk cases to more experienced surgeons
- Systematic efforts to improve risk factor coding
- Mandatory audits of all surgical deaths
- A 2003 survey of Ontario cardiac surgeons revealed
  - 50% opposed public release of hospital-specific data
  - 80% opposed release of surgeon-specific data
  - Most agreed outcomes report cards were an important indicator of quality of care
  - Concerned about
    a) being labelled an outlier
    b) 'upcoding' of data at other institutions

Guru V et al. CJC 2009

Correlation between risk-adjusted hospital mortality rates and proportion of preventable deaths after CABG surgery



Guru, V. et al. Circulation 2008;117:2969-2976

Lessons learned

- CABG report cards have been an effective tool for quality assurance in Ontario
- Risk-adjustment requires a few key variables
- No evidence of systematic ‘up-coding’ or ‘skimming’ i.e., avoidance of high-risk patients
- Collaboration between clinical researchers and surgeons has helped ‘buy-in’
- Approximately 1/3 of deaths may have been potentially ‘preventable’
- Reporting has since expanded to include other types of cardiac procedures (e.g. aortic valve surgery, PCI/ angioplasty)

ORIGINAL CONTRIBUTION

Effectiveness of Public Report Cards for Improving the Quality of Cardiac Care

The EFFECT Study: A Randomized Trial

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Context Publicly released report cards on hospital performance are increasingly common, but whether they are an effective method for improving quality of care remains uncertain.

Objective To evaluate whether the public release of data on cardiac quality indicators effectively stimulates hospitals to undertake quality improvement activities that improve health care processes and patient outcomes.

Design, Setting, and Patients Population-based cluster randomized trial (Enhanced Feedback for Effective Cardiac Treatment [EFFECT]) of 86 hospital corporations in Ontario, Canada, with patients admitted for acute myocardial infarction (AMI) or congestive heart failure (CHF).

Intervention Participating hospital corporations were randomized to early (January 2004) or delayed (September 2005) feedback of a public report card on their baseline performance (between April 1999 and March 2001) on a set of 12 process-of-care indicators for AMI and 6 for CHF. Follow-up performance data (between April 2004 and March 2005) also were collected.

Main Outcome Measures The coprimary outcomes were composite AMI and CHF indicators based on 12 AMI and 6 CHF process-of-care indicators. Secondary outcomes were the individual process-of-care indicators, a hospital report card impact survey, and all-cause AMI and CHF mortality.

Results The publication of the early feedback hospital report card did not result in a significant systemwide improvement in the early feedback group in either the composite AMI process-of-care indicator (absolute change, 1.5%; 95% confidence interval [CI], −2.2% to 5.1%; $P=.43$) or the composite CHF process-of-care indicator (absolute change, 0.6%; 95% CI, −4.5% to 5.7%; $P=.81$). During the follow-up period, the mean 30-day AMI mortality rates were 2.5% lower (95% CI, 0.1% to 4.9%; $P=.045$) in the early feedback group compared with the delayed feedback group. The hospital mortality rates for CHF were not significantly different.

Conclusion Public release of hospital-specific quality indicators did not significantly improve composite process-of-care indicators for AMI or CHF.

Trial Registration clinicaltrials.gov Identifier: NCT00187460

JAMA. 2009;302(21):(doi:10.1001/jama.2009.1731) www.jama.com

PUBLIC RELEASE OF HOSPITAL PERformance data is increasingly being mandated by policy makers with the goal of improving the quality of care.[1,2] Advocates of report cards believe that publicly releasing performance data on hospitals will stimulate hospitals and clinicians to engage in quality improvement activities and increase the accountability and transparency of the health care system.[3,4] Critics argue that publicly released report cards may contain data that are misleading or inaccurate and may unfairly harm the reputations of hospitals and clinicians.[5-7] They also are concerned that report card initiatives may divert resources away from other important needs. Although there has been considerable debate, few empirical data exist to determine whether publicly released report cards on hospital performance improve the overall quality of care provided.

While several uncontrolled studies have suggested that certain report card initiatives have had a beneficial effect, no large randomized trials, to our knowledge, have been conducted to evaluate the effectiveness of public

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Tu JV, et al. JAMA 2009; 302 (21)

Can public report cards improve quality of care?

- Public reporting of hospital performance identified as a potential strategy to improve quality of care

Pros

- Stimulate quality improvement (QI) activities by hospitals and clinicians
- Enhance transparency and accountability

Cons

- Concerns about data quality and 'risk-adjustment'
- Impact on hospital's reputation
- No clinical trials demonstrating effectiveness

http://www.ccort.ca/EFFECTStudy.aspx

Enhanced Feedback for Effective Cardiac Treatment (EFFECT) study

- Hypothesis – Public release of hospital report cards would improve the quality of cardiac care provided
  - Heart attack (AMI), heart failure (CHF)

- Design – Cluster randomized trial of 86 hospital corporations in Ontario, Canada

- Intervention
  - Hospitals randomized to Early (Jan 2004) or Delayed (Sept 2005) feedback of a public report card on baseline performance (April 1999 to March 2001) on national AMI / CHF process-of-care quality indicators

  - Estimated audience: $\geq$ 12 million Canadians exposed to the early feedback results via the media

  - Follow up data (April 2004 to March 2005) collected to assess for changes in quality indicators and outcomes

http://www.ccort.ca/EFFECTStudy.aspx

Main outcome measures

- Co-primary outcome measures
  1) Composite AMI indicator – all 12 AMI process-of-care quality indicators
  2) Composite CHF indicator – all 6 CHF process-of-care quality indicators

- Secondary outcome measures
  1) Individual process-of-care quality indicators
  2) Hospital report card impact survey
  3) AMI and CHF all-cause mortality rates

- Statistical power
  – The study had 84% power to detect a 5% absolute difference in the composite quality indicators between the two study arms

AMI = heart attack
CHF = heart failure

130 Hospital Corporations Assessed for Eligibility

44 Hospital Corporations Excluded
(42 low volume, 2 no longer acute care)

86 Hospital Corporations Randomized

Early Feedback

Baseline—44 Hospital corporations randomized to early feedback report card (April, 1999 - March, 2001)

Early feedback report card
January 2004

Hospital Report Card
Impact Survey June 2004

Follow up—2 Hospital corporations unable to participate in follow up
(April, 2004 – March, 2005)

Analysis—42 Hospital corporations
2 Hospital corporations excluded

Delayed Feedback

Baseline—42 Hospital corporations randomized to delayed feedback report card (April, 1999 - March, 2001)
1 Hospital corporation withdrew

Hospital Report Card
Impact Survey June 2004

Delayed feedback report card
September 2005

Follow up—2 Hospital corporations unable to participate in follow up
(April, 2004 – March, 2005)

Analysis—39 Hospital corporations
2 Hospital corporations excluded

Hospital report card impact survey

Question	Early Feedback Hospitals	Delayed Feedback Hospitals	P Value
	41/44 surveys (93.2%)	30/41 surveys (73.2%)	
Q. Who at your hospital read / discussed the Early Feedback report card?			
Chief of Medicine/Cardiology	34 (82.9%)	18 (60.0%)	0.031
Other Medical Staff	33 (80.5%)	15 (50.0%)	0.007
Q. Made changes to *AMI* care in response to the Early Feedback report card?			
Yes	30 (73.2%)	14 (46.7%)	0.003
Q. Made changes to *CHF* care in response to the Early Feedback report card?			
Yes	25 (61.0%)	15 (50.0%)	0.038

AMI = heart attack CHF = heart failure

Hospital report card impact survey (cont'd)

Question	Early Feedback Hospitals	Delayed Feedback Hospitals	P Value
	41/44 surveys (93.2%)	30/41 surveys (73.2%)	
Q. Changes made to *AMI* care in response to the Early Feedback report card			
Introduced new / revised standard adm orders/care paths	22 (53.7%)	13 (43.3%)	0.39
Conducted an initiative to improve Door-to-Needle times	16 (39.0%)	5 (16.7%)	0.042
Changed policies to enable ED physicians to decide re: lytics	10 (24.4%)	2 (6.7%)	0.049
Q. Changes made to *CHF* care in response to the Early Feedback report card			
Introduced new / revised standard adm orders/care paths	18 (43.9%)	9 (30.0%)	0.23
Initiated a CHF clinic	5 (12.2%)	4 (13.3%)	0.88

AMI = heart attack CHF = heart failure

EFFECT Study

Mean change in hospital-specific mortality rates after publication of report cards for Early Feedback arm

All-Cause Mortality	Early Feedback Hospitals (N=42)		Delayed Feedback Hospitals (N=39)		Absolute Difference* Early vs Delayed % (95% CI)	P Value
	Baseline	Follow up	Baseline	Follow up		
AMI patients						
30 day	11.7%	9.8%	12.2%	12.2%	-2.5 (-4.9 to -0.1)	0.045
1 year	19.2%	19.4%	20.2%	22.5%	-3.1 (-6.4 to 0.2)	0.06
CHF patients						
30 day	11.3%	9.6%	10.4%	10.6%	-1.1 (-3.2 to 0.9)	0.26
1 year	32.6%	30.3%	33.2%	32.9%	-2.8 (-6.0 to 0.5)	0.10

AMI = heart attack CHF = heart failure

*Absolute difference represents the mean relative improvement in each mortality indicator in the early feedback hospitals as compared with the delayed feedback hospitals in the follow up patient cohort after adjusting for performance in the baseline patient cohort and type of hospital. Negative values indicate better performance in the early feedback hospitals.

Lessons learned from EFFECT

- Report cards based on clinical data are more credible and useful to hospitals
- Public report cards are more likely to stimulate QI activities than confidential reporting
- “Hawthorne Effect” with public reporting
- High level of heterogeneity in terms of how hospitals/physicians respond to data
- Should try to reduce number of indicators to a few key indicators
- Possible to rigorously evaluate effectiveness of report cards

Conclusions

- Cardiac report cards in Ontario have been an effective instrument for stimulating a variety of quality improvement initiatives aimed at improving the quality of cardiac care
- Report cards that include clinical data and process of care indicators are important complements to those derived solely from outcome indicators and administrative data
- Clinical/stakeholder involvement is important in developing effective report cards
- Need to develop mechanisms for efficient and timely clinical data collection
- Need to develop better capacity (e.g. QI teams) in the health care system to act on report card information.

Acknowledgments

- Our thanks to
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  - All the hospitals, clinicians, and administrators across Ontario/Canada who have participated in these report card initiatives