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# Hospital Board And Management Practices Are Strongly Related To Hospital Performance On Clinical Quality Metrics

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**ABSTRACT** National policies to improve health care quality have largely focused on clinical provider outcomes and, more recently, payment reform. Yet the association between hospital leadership and quality, although crucial to driving quality improvement, has not been explored in depth. We collected data from surveys of nationally representative groups of hospitals in the United States and England to examine the relationships among hospital boards, management practices of front-line managers, and the quality of care delivered. First, we found that hospitals with more effective management practices provided higher-quality care. Second, higher-rated hospital boards had superior performance by hospital management staff. Finally, we identified two signatures of high-performing hospital boards and management practice. Hospitals with boards that paid greater attention to clinical quality had management that better monitored quality performance. Similarly, we found that hospitals with boards that used clinical quality metrics more effectively had higher performance by hospital management staff on target setting and operations. These findings help increase understanding of the dynamics among boards, front-line management, and quality of care and could provide new targets for improving care delivery.

**H**ospitals increasingly face financial pressure to improve quality through national programs such as Hospital Value-Based Purchasing, the Hospital Readmissions Reduction Program, and the Hospital-Acquired Condition Reduction Program. Despite the recently increased emphasis by policy makers on linking payment and quality, quality improvement efforts have traditionally focused on the processes and outcomes of clinical providers. Less is known about how two critical elements, leadership and management, influence the delivery of high-quality care and how those effects might be empirically verified.<sup>1</sup>

Several previous studies have shown an asso-

ciation between hospital board practices and quality of care.<sup>2-5</sup> Although these studies have been helpful, they have not been able to clearly delineate which specific activities of the boards affect quality of care and how they relate to hospital managers' activities. Furthermore, it is unclear whether board activities and management activities are independently important in driving quality performance. It is known that there are large variations in both how hospital boards engage with clinical quality as well as managerial practices across institutions.<sup>2,5-8</sup> Understanding how hospital boards and management interact with each other, and the way in which they might drive gains in quality, is critically important. The lack of empirical data in this area, however, has

hampered the ability to intervene on these factors and improve care.

This study exploited detailed, hospital-level data to provide empirical evidence about the relationship between the activities of hospital boards and the type of managerial practices adopted by hospital administrators in a sample of acute care hospitals in the United States and England. The boards and management studies were performed independently using national samples of hospitals.<sup>2,4,9</sup> Linking these data together, we asked three key questions: First, do high-quality hospitals have better management practices than low-quality hospitals? Second, is there a relationship between hospital board performance and management performance? Lastly, do certain types of board practices correlate with comparable management practices? We hypothesized a priori that hospitals whose boards focused on using quality metrics would be more likely to have management practices centered on target setting.

## Study Data And Methods

**DATA** Our primary data set was the health care component of the World Management Survey specific to the United States and England. The World Management Survey includes data from approximately 2,000 hospitals in nine countries.<sup>7,10</sup> It employs an interview-based evaluation tool across twenty management practices rated on a scale from 1 to 5, which are then aggregated into four key dimensions of effective management practice: operations, monitoring, targets, and human resource management (see online Appendix Exhibits A1 and A2).<sup>11</sup>

The methodology of the World Management Survey has previously been well described (see Appendix Exhibit A3).<sup>9,11</sup> Briefly, managers of hospitals were defined as clinical service leaders and represented a diversity of professional backgrounds including physicians and nurse managers. Mid-level and front-line managers were selected because they were senior enough to have an overview of management practices yet still involved in day-to-day operations and, therefore, more likely to have a direct relationship with care delivery in each hospital. A double-blind survey technique was employed with random sampling of acute care hospitals in each country. Although new to the health services literature, the World Management Survey data set has emerged as an important data set for the empirical analysis of management practices across multiple sectors.<sup>6,8,12</sup>

Administered during July–September 2009, the World Management Survey had a response rate of 22.3 percent for the United States and

39.7 percent for England, representing 327 and 184 hospitals, respectively. In the US survey, 44 percent of respondents were nurse managers or clinical service leads; 51 percent were chief nursing officers, directors of nursing, or clinical leads with responsibility across multiple departments; and 5 percent were other physician or nurse administrators. In the English survey, 50 percent of respondents were nurse managers or clinical service leads; 40 percent were chief nursing officers, directors of nursing, or clinical leads with responsibility across multiple departments; and 10 percent were other physician or nurse administrators.

We then merged data from the US and English components of the World Management Survey with data from a 2009 survey of US boards of trustees and a 2010 survey of English boards of trustees. The US boards survey contacted 922 board chairs overseeing 1,000 acute care hospitals in the United States, with a response rate of 78.3 percent (722 board chairpersons overseeing 767 hospitals, see Appendix Exhibit A4).<sup>2,11</sup> The English boards survey contacted 171 boards overseeing 536 acute care hospitals in England, with a response rate of 77.0 percent (132 board chairpersons overseeing 250 hospitals).<sup>4</sup>

Data on hospital characteristics were then merged in from the 2011 American Hospital Association Annual Survey and the English National Health System's 2010 Health and Social Care Information Centre's Hospital Estates and Facilities Statistics data warehouse. These data were then finally merged with hospital quality data from the Centers for Medicare and Medicaid Services (CMS) Hospital Compare for US hospitals and the Care Quality Commission for English hospitals. Detailed methodology and results of both board surveys have been previously published.<sup>2,4</sup>

**QUALITY-OF-CARE VARIABLES** The primary categorization of hospitals as high or low quality was based on two well-validated metrics of hospital quality. For US hospitals, we calculated an overall summary score on nineteen evidence-based practices across three clinical conditions—acute myocardial infarction, congestive heart failure, and pneumonia—using a commonly accepted methodology for the Hospital Quality Alliance (HQA) evidence-based process measures available from CMS's Hospital Compare.<sup>2,13</sup> Hospitals were high quality if they were in the top decile of HQA performance. For English hospitals, hospital quality was determined using the National Health Service's (NHS's) quality rating program "Overall Quality of Services" score from the Care Quality Commission, which aggregates a hospital's performance across forty-four core standards, nine existing commitments, and

fourteen national priorities. Scores ranged from 0 (weak) to 3 (excellent), and we categorized hospitals scoring in the “excellent” category as high quality.<sup>4</sup>

**HOSPITAL MANAGEMENT VARIABLES** Our primary independent variable was the overall management score from the World Management Survey, which rated a hospital’s overall management score from 1 to 5, with a score of 5 being the highest, across twenty questions explored in the course of a telephone interview with the manager. We also assessed hospitals’ performance on the specific domains of management: operations, monitoring, targets, and human resources. Additional covariates from the World Management Survey included variables for respondent seniority, respondent profession (nurse manager or physician), interview reliability (interviewer dummy variable), interview duration, and country (United States or England).

**HOSPITAL BOARD VARIABLES** The boards survey data sets provided information on two domains of board practice: focus on clinical quality, representing the amount of time and attention placed on quality during board meetings; and use of clinical quality metrics, representing the usage of quality metrics in board decisions and compensation of senior administrators.

To measure board focus on quality, we used survey questions related to board expertise on quality, perceived influence on quality, engagement in quality, rating of clinical quality as a priority, and inclusion of quality on the hospital board agenda. We standardized each survey question into a z-score across hospitals and then averaged across all questions to obtain a single z-score metric, with a higher z-score capturing boards that placed greater attention on quality.

Similarly, to capture differences in the use of quality metrics, we built a z-score index based on survey questions measuring the use of a clinical quality dashboard; goal setting during board meetings; frequency of review of quality metrics; use of data for feedback or incentives; and patient safety as a relevant metric for CEO evaluation and remuneration.

We defined the average across-the-board focus on quality and the board’s use of quality metrics indices as our primary measure of the adoption of effective board practices around quality. An additional control variable from the hospital boards data set described whether a hospital was part of a larger hospital system and, therefore, overseen by a shared board.

Hospital-level variables from the 2011 American Hospital Association Annual Survey and the 2010 NHS Hospital Estates and Facilities Statistics included hospital bed size, ownership (state-owned/public versus private), teaching

## Effective board practices were associated with a specific pattern of management practices.

status, and critical-access status.

**STATISTICAL ANALYSIS** We performed descriptive analyses of the structural features, overall management score, board focus on quality index, and board use of quality metrics index for the hospitals in our sample of merged hospitals. We next built a multivariate probit regression model with hospital quality as our dependent variable and the overall management score as our main independent variable. Our model included robust standard errors and controlled for hospital characteristics, such as ownership and teaching status, as well as a set of survey variables including boards overseeing more than one hospital, respondent seniority, respondent profession, interview duration, and interview reliability (interviewer dummy variable). These regressions also included a country dummy to distinguish between US and English hospitals.

Lastly, we built a series of multivariate regression models to assess the relationship between the z-score management index for each domain of management (operations, monitoring, targets, and human resources) and the z-score measure for each domain of board practice (focus on quality and use of quality metrics), with the former as the dependent variables and the latter as independent variables. All together, we estimated eight models (each of the four dependent variables were regressed against the two predictors). All regression models controlled for hospital characteristics as well as survey response controls from the World Management Survey and the boards survey data sets.

**LIMITATIONS** Our study had several limitations. First, we relied on two separate data sets: the World Management Survey and the hospital boards survey. As such, our models were estimated on a nonrandom subset of hospitals in the United States and England. Thus, our findings might not necessarily be representative of all hospitals. Although the two board surveys had response rates greater than 70 percent, the man-

agement surveys had lower response rates. While we included interview noise controls such as the interviewer (dummy coded variable), interview duration, and respondent seniority, there nevertheless may be residual response bias from the underlying World Management Survey. The hospitals included in the analysis may, therefore, be nonrepresentative of the full population.

Second, because we felt that hospital boards and front-line managers were most likely to be responsive to the specific publicly reported quality metrics in their country, we relied on country-specific definitions of quality. Because of the different number and type of quality metrics across countries, data on quality may not be directly comparable between the United States and England. Although we adjusted for differences in hospitals' locations and main characteristics, it may still be that our results are influenced by unobservable differences in patient mix or other organizational or market factors. Furthermore, our study employed a cross-sectional observational design; therefore, we could not confirm causal relationships.

## Study Results

**HOSPITAL FEATURES** Our matched sample consisted of 103 hospitals in the United States and England that responded to both the boards and management surveys. On a scale of 1 to 5, the average overall management score for the sample was 2.85 (standard deviation  $\pm 0.45$ ). Hospi-

tals with management scores above the median were more likely to be teaching hospitals (33.3 percent versus 14.3 percent) (Exhibit 1). These hospitals also had a higher board quality focus (0.237 versus  $-0.261$ ) and were more likely to use performance on quality metrics to evaluate and remunerate hospital chief executives (62.7 percent versus 41.7 percent).

**RELATIONSHIP BETWEEN HOSPITAL QUALITY AND MANAGEMENT PRACTICES** Hospitals determined to be of high quality generally had significantly higher performance on management practices than low-quality hospitals. Hospitals with management scores above the median were more likely to be high-quality hospitals (42.6 percent versus 14.3 percent,  $p < 0.01$ , data not shown). In unadjusted analyses, high-quality hospitals had higher performance than low-quality hospitals for the overall management score (3.12 versus 2.74,  $p < 0.001$ ) (Exhibit 2) as well as the specific domains of management practice including operations (3.18 versus 2.85,  $p < 0.001$ ), monitoring (3.37 versus 3.00,  $p < 0.001$ ), targets (3.05 versus 2.65,  $p < 0.001$ ), and human resources (2.93 versus 2.51,  $p < 0.001$ ). These relationships remained significant in multivariate regression analyses adjusting for hospital structural features and survey response controls. A one-standard-deviation increase in the overall management score was associated with a 21.8 percent and 20.0 percent increase in the probability of being a high-quality hospital, respectively, in unadjust-

### EXHIBIT 1

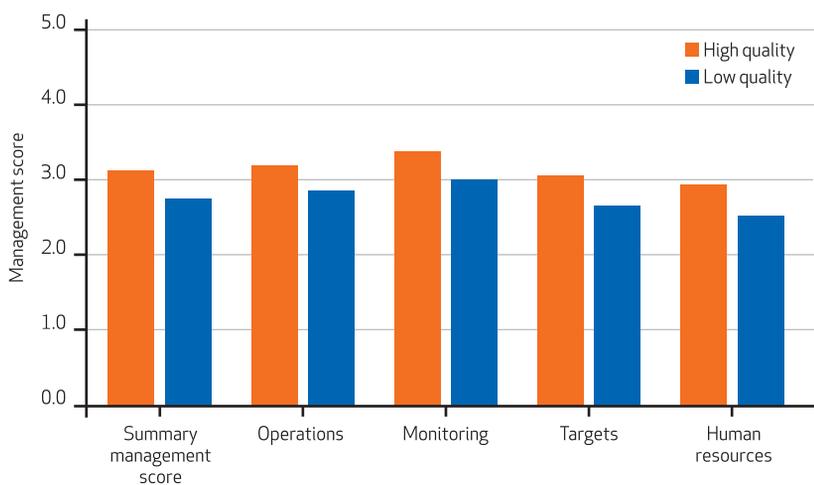
#### Characteristics Of Hospitals Receiving High Overall Management Scores In The 2009 World Management Survey

Hospital characteristic	Below median management score (n = 49)	Above median management score (n = 54)
Size (number of beds)	406	448
State ownership	75.5%	70.4%
Teaching status	14.3%**	33.3%**
Board focus on quality		
Quality Focus Index (z-score)	$-0.261^{**}$	0.237**
Expertise on quality	75.0%**	90.6%**
Perceived influence	14.3%	30.6%
Board engagement in quality issues	17.8%	18.9%
Clinical quality as a priority	92.3%	95.7%
Quality in agenda	80.9%	88.9%
Board usage of quality metrics		
Quality Metrics Index (z-score)	$-0.134$	0.122
Use of dashboard	91.8%	92.6%
Goals setting and dissemination	88.9%	88.7%
Frequency of reviews	55.1%	60.4%
Use of data for feedback, incentives, or awards	57.1%	58.3%
CEO evaluated and remunerated on safety metrics	41.7%**	62.7%**

**SOURCE** Authors' analyses. \*\* $p < 0.05$

EXHIBIT 2

Relationship Between Hospital Quality And Management Practices



**SOURCE** Authors' analyses. **NOTES** Management scores range from 1 to 5; see text for details. For all comparisons of management scores between high- and low-quality hospitals,  $p < 0.01$ .

ed and adjusted regression analyses (data not shown).

**RELATIONSHIP BETWEEN OVERALL BOARD AND MANAGEMENT PERFORMANCE** Hospitals with high management performance (those rating highly in the categories of operations, monitoring, targets, and human resources) also were more likely to have higher board performance (those rating highly in attention to clinical quality and metrics). Hospitals performing above the

median overall in the board performance index had a higher overall management score than those performing below the median (2.98 versus 2.70,  $p < 0.001$ ). In the adjusted regression analysis, using the standardized (z-score) index for overall board and management performance, a one-standard-deviation increase in the board score was associated with a 0.297 standard deviation increase in the management score ( $p < 0.001$ ).

**RELATIONSHIP BETWEEN HOSPITAL BOARD AND MANAGEMENT PRACTICES** Effective board practices were associated with a specific pattern of management practices. Unique patterns were identified with each of the two domains of board performance—attention to quality and effective use of metrics. First, boards with a higher attention to quality as determined by their z-score had the highest management practices in monitoring quality: Each standard-deviation increase in the board attention to quality index was associated with an increase of 0.338 standard deviation in the monitoring management score ( $p < 0.001$ , Exhibit 3). Second, hospitals with effective board practices that centered on the use of quality metrics showed a greater association with management scores in the domains of target setting ( $p < 0.001$ ) and operations ( $p < 0.01$ ).

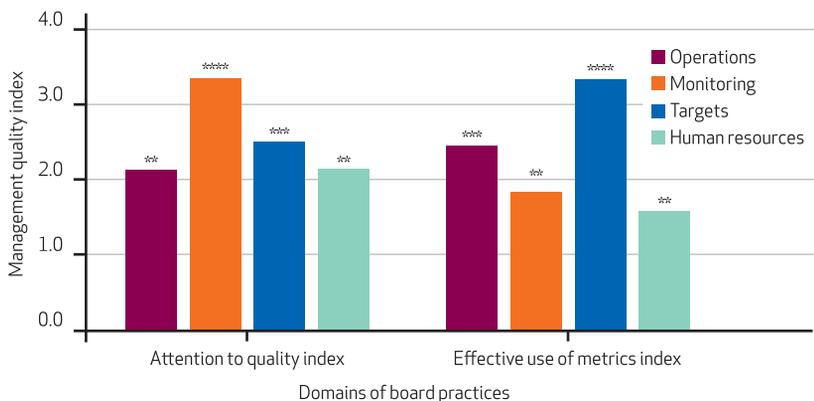
Discussion

High-quality hospitals were more likely to have better management processes related to operations, monitoring, target setting, and human resources than low-quality hospitals. Management scores were significantly higher in hospitals with boards that paid greater attention to quality and that were more likely to adopt effective practices related to the use of data on clinical quality metrics. These findings suggest that board and management practices are both strongly related to a hospital's performance on clinical quality metrics and may provide a unique target for quality improvement interventions reaching across multiple clinical domains.

Our results are in line with the emerging literature suggesting that effective hospital governance by boards is related to a hospital's performance on quality.<sup>1-5,14-16</sup> Our findings contribute to this literature by providing novel evidence on how board and management practices interact with each other and their relationship with quality. We found that several structural features of hospitals, such as teaching hospital status, were related to better management scores. This may reflect a greater commitment to quality because of higher standards expected of these hospitals. Further study of this finding is warranted.

EXHIBIT 3

Characteristic Patterns Of Hospital Board And Management Practices



**SOURCE** Authors' analyses. **NOTES** Multivariate generalized linear regression models with domains of management practice as unique dependent variables and domain of board practice as the predictor. Both management and board indices have been standardized using a z-score. Accordingly, the exhibit depicts corresponding response in management index per one-standard-deviation increase in the board index. All regressions adjust for country, hospital ownership, teaching status, critical access care, and management survey reliability (respondent seniority, respondent profession, interview duration, and interviewer dummy variable). \*\* $p < 0.05$  \*\*\* $p < 0.01$  \*\*\*\* $p < 0.001$

# Our findings introduce new policy tools that might be available to policy makers as they seek to achieve higher-value care.

By sorting board practices into domains—attention to quality and effective use of quality metrics in board decisions—our findings suggest that specific board practices are, in turn, related to distinct management practices through the two unique patterns or signatures, also described in the results section. First, hospitals with a higher level of board attention to quality were likely to have stronger management practices centered on monitoring quality. Increased board attention to quality was evidenced by dedicating a greater proportion of time during board meetings to discussing quality and performing more frequent performance reviews with middle management. Second, hospitals with boards that more effectively used quality metrics had management practices centered on target setting and operations. This second signature was characterized by hospitals with boards that tied CEO remuneration to quality performance and middle management that balanced internal metrics established by their boards and external metrics established by government and regulators. These signatures of high-performing hospitals may be informative for understanding why some hospitals are more effective than others at responding to policy efforts such as public reporting or value-based purchasing. Initiatives focused on meeting publicly reported metrics such as mortality rates, readmission rates, and patient satisfaction may be easier to implement in hospitals where boards are able to translate strategic objectives into local targets for clinical managers.

The existing literature on hospital management has largely relied on qualitative data or theory-based approaches to assess management by organizational structure and function.<sup>17,18</sup> Much of it has focused on whether better management improves the efficiency and financial performance of hospitals<sup>19,20</sup> or on clinical engagement by hospital management.<sup>21–25</sup> We extend this literature by applying a data-driven

taxonomy of managerial practices at the hospital level to provide empirical insight into the relationship among hospital governance, management, and clinical performance. Adopting the framework proposed by Federico Lega and colleagues, our study addressed two of the three proposed questions on the relationship between management and hospital quality.<sup>26</sup> First, we showed that management plays a substantial role in overall hospital performance. Hospitals with high performance across a broad array of process and outcomes-based health care quality metrics are associated with better management practices. This finding is in line with the emerging body of literature on the role of management practices in health care.<sup>8,26</sup> Second, we demonstrated the relationship among specific aspects of management—operations, monitoring, targets, and human resources—and board practices to suggest how incentives for hospital management and governance may be aligned. What remains unanswered in our analyses is the potential direction of influence—whether boards influence management or vice versa.

## Policy Implications

Our findings have important implications for policy as well as for health systems practice. Federal policy makers have signaled a commitment to accelerating the Affordable Care Act's (ACA's) transition to value-based payments by linking the majority of current Medicare fee-for-service reimbursements to quality in the next few years.<sup>27</sup> This has the potential to create new impetus for organizational leaders to improve and ultimately deliver high-quality care. Given the relationship between board and management performance with hospital performance on quality metrics, our findings suggest that there are other important tools that policy makers can use to drive improvements. For hospitals that are struggling with lower quality, encouraging board or management training (or both) might be useful. Our findings also introduce new policy tools that might be available to policy makers as they seek to achieve higher-value care. New funding for research and innovation that discovers how to develop and improve governance and management practices—just as funding is directed to drug and device development—should be considered by policy makers as an integral component of the transition toward a more value-oriented health care delivery system.

For health systems practice, effective management may be an important precondition for quality improvement efforts to be effective. The landmark Institute of Medicine report *To Err Is Human* helped usher in a paradigm of systems-

level solutions to improving patient safety.<sup>28</sup> Our data suggest that improving board and management practices may be an important and previously underappreciated component of systems-level change. There are significant variations in management practices across hospitals in both the United States and England, and mitigating these variations by fostering the adoption of best managerial practices could translate into better care for patients. Given the recent increase in hospital consolidation, there is also concern that managerial focus has been directed toward expansion instead of internal improvement. Front-line staff and senior managers often have different perceptions of both the goals and results of quality improvement efforts, and the lack of a shared commitment and understanding by hospital leadership and staff may hinder the effectiveness of quality improvement initiatives.<sup>29</sup> Similarly, the massive increases in mergers and acquisitions in the US hospital market may potentially refocus the attention of boards and managers away from maintaining and improving the quality of care.<sup>30</sup> Given the evidence that reduced competition in a market is associated with inferior management practices in hospitals, the concern over quality depletion is valid.<sup>12,31</sup> Aligning the incentives of clinicians, managers, and hospital board members could be a useful approach to mitigating any of these untoward effects of consolidation. Further empirical research on managerial performance and practices, therefore, is needed in order to inform potential interventions aimed at improving the performance of hospital governance and management.

Although there have been a series of national efforts to improve the quality of hospital gover-

nance,<sup>32</sup> similar initiatives related to management practices have been less common and may provide an important opportunity to improve care. In one study of management practices and the quality of care in cardiac units, hospitals with better management practices were associated with lower thirty-day risk-adjusted mortality as well as performance on process-of-care measures.<sup>8</sup> Whether these relationships are only observational or causal is unclear, although the empirical data from other industries suggest that interventions targeted at improving management can result in better organizational performance.<sup>6</sup>

### Conclusion

In summary, we found that more effective management practices were associated with higher-quality hospitals. Additionally, effective board and management practices were closely related within hospitals. Finally, two signatures of high-performing hospitals emerged. Hospitals with boards that had a high attention to quality had more effective management practices in monitoring, while hospitals with boards that effectively used clinical quality metrics were more likely to have effective target setting and operations management practices.

As the ACA accelerates the transition toward value-based payment models linking together payment and quality, aligning hospital strategic and management goals with effective clinical care at the bedside will become critically important. Further understanding the dynamics among hospital governance, management, and clinicians will provide new opportunities for quality improvement. ■

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Thomas Tsai is currently serving as an adviser to the Office of the Assistant Secretary for Planning and Evaluation in the Department of Health and Human Services (HHS). The views expressed in this article are those of the authors and do not reflect the official views of HHS.

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