Does Management Matter in Healthcare?

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Abstract:
We collect data on management practices for operations, targets and human resources in 2,000 hospitals in Brazil, Canada, France, Germany, India, Italy, Sweden, UK and the US. These management practices are strongly associated with better clinical outcomes, such as heart attack survival rates, and financial outcomes like profits. We show that hospitals with more clinically trained managers, that are larger, that operate in more competitive markets, and that are not government owned appear to have significantly higher management scores. The US and UK have the highest average management scores, which we think may be due to relatively politically independent appointment of hospital leaders and stronger accountability mechanisms.

Keywords: Management, healthcare, hospitals

JEL Classification: M1, I1

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1 Introduction

Healthcare systems are under severe pressure due to aging populations, rising costs of medical technologies, budget austerity and increasing expectations. An attractive way to tackle these cost pressures is through improving hospital productivity. There is evidence of enormous variations in efficiency levels across different hospitals and healthcare systems. For example, the "Dartmouth studies" show substantial variation in healthcare costs and have influenced the Affordable Care Act.[1] Some commentators focus on technologies such as IT as a key reason for such differences, but others have focused on management practices such as checklists. In this paper we follow the latter approach and seek to measure management practices across hospitals in the US and eight other countries using a survey tool originally developed by Bloom and Van Reenen (3) for the manufacturing sector. The underlying concepts of the tool are very general and provide a metric to measure the adoption of best practices over monitoring, targets and people management in hospitals.

We document considerable variation in management between and within countries. The US obtains the highest average management score and India the lowest. Exploiting the within country variation in the data we show that: (i) hospital level management scores are strongly correlated with hospital outcomes such as heart attack survival rates in all countries where we have data; and (ii) there are key features of hospitals that are associated with better management quality. First, hospitals with a greater fraction of managers who are clinically trained obtain higher scores. Second, larger hospitals have higher scores than smaller ones. Third, hospitals facing more competition in their local

[1] For example, annual Medicare spending per capita ranges from $6,264 to $15,571 across geographic areas, yet health outcomes do not positively co-vary with these spending differentials (2, 9).

markets appear to be better managed. Fourth, government owned hospitals have significantly lower management scores than private hospitals (both for-profit and not-for-profit providers). Interestingly, these four factors – skills, scale, competition and state ownership – are also important for explaining the variation in management in other sectors like manufacturing, retail and schools. In the final section of the paper, we show that *unlike* manufacturing or retail, but similarly to schools, almost half of the variation in our management data is between countries rather than within countries. This suggests country level factors are particularly important in determining hospitals management practices and efficiency. We discuss institutional factors that could cause this pattern, focusing on greater accountability (e.g. from the publication of data and market competition) and the independent appointment of hospital leaders.

Our paper relates to several literatures. First, there is the literature on productivity differences. For example, Chandra et al (8) shows large variations in hospital "Total Factor Productivity" just as in other sectors, suggesting that healthcare may be less exceptional as some might be thought. On one level this is a puzzle as imperfect competition, asymmetric information (e.g. between patients and physicians), government regulations over insurance and so on are thought to make health fundamentally different from other sectors (Arrow, 1963; 9). But both Chandra et al. and our work imply that these problems of incentives and information may be common. Finally, this paper is related to the ongoing work on measuring management practices across countries and sectors (5).

The structure of the paper is as follows. In section 2 we provide an overview of the methodology used to collect the management data. Section 3 describes the basic summary statistics emerging from the data. Section 4 looks at the correlation between management and AMI mortality rates and

other hospital outcomes. Section 5 examines the correlation between management and hospital specific characteristics controlling for country fixed effects. Section 6 provides some possible explanations behind the differences in hospital management across countries. Section 7 concludes.

2. Methodology

To measure management practices we adapt the Bloom and Van Reenen (3) methodology. This interview-based tool scores a set of 20 basic management practices on a grid from one ("worst practice") to five ("best practice"). A high score represents a best practice, at least based on our initial hypothesis based on the healthcare management literature. Our main measure of management practices represents the average of these 20 scores. This evaluation tool can be interpreted as attempting to measure management practices in three broad areas: operations (8 questions), targets (5 questions) and human resource management (7 questions). The full list of dimensions can be found in the Appendix.

To persuade hospital employees to participate we used a variety of procedures. First, we strongly encouraged our interviewers to be persistent –on average they ran two 60 minute interviews a day, spending the remaining 6 hours of their day repeatedly contacting hospital leaders to schedule interviews. Second, we presented the study as a "piece of work" based on a confidential conversation about management experiences. Third, we never asked hospital managers about the hospital's overall performance during the interview (as we can obtain this data from external sources). Fourth, we sent informational letters, and, if necessary, copies of country endorsements letters (e.g. UK Health Department).

In order to elicit candid responses we took several steps. First, our interviewers were extensively trained in advance on hospital management, and targeted clinical service leads in hospitals that had a good overview of the hospital's practices. We also employed a double-blind technique. Interviewers are not told in advance about the hospital's performance- they only have the hospital's name and telephone number – and respondents are not told in advance their answers are scored. We told them we were interviewing them about their hospital management, asking open-ended questions like "*Tell me how you track performance?*" and "*If I walked through your ward what performance data might I see?*". The combined responses to these types of questions are scored against a grid. For example, these two questions help to score question 6, *performance monitoring*, which goes from 1, which is defined as *"Measures tracked do not indicate directly if overall objectives are being met. Tracking is an ad-hoc process (certain processes aren't tracked at all)*", to 5 defined as "*Performance is continuously tracked and communicated, both formally and informally, to all staff using a range of visual management tools.*" Interviewers kept asking questions until they could score each dimension.

Other steps to guarantee data quality included: (i) each interviewer conducted on average 39 interviews in order to generate consistent interpretation of responses. They received one week of intensive initial training and four hours of weekly on-going training[2]; (ii) 70% of interviews had another interviewer silently listening and scoring the responses, which they discussed with the lead interviewer after the end of the interview. This provided cross-training, consistency and quality assurance. (iii) We collected a series of 'noise controls', such as interviewee and interviewer characteristics. We include these controls in the regressions to reduce potential response bias.

[2] See, for example, the video of the training for our 2009 wave http://worldmanagementsurvey.org/?page_id=187

Exhibit 1 presents hospital characteristics across countries. Although there are many differences in cross country means (e.g. French hospitals employ an average of 752 people compared to 139 in Canada). However, within all countries non-responders were not significantly different from participating hospitals. Characteristics are different because the healthcare systems differ and our sample reflects this.

3. How does management vary across and within countries?

Exhibit 2 presents the cross-country averages of average management scores. The US is at the top, followed by the UK, then two Northern EU countries with India on the lowest score. The rankings remain unchanged when controlling for size, specialty and interview noise controls. Given that the US outspends all the other nations in healthcare, it is unsurprising it tops the list. By the same token, finding the lowest score in India, the poorest country in our sample might be expected. The US obtains the highest management scores and India one of the lowest in manufacturing as well (Bloom et al, 2013).

The management ranking differs from some other international health system because we are measuring only one aspect of healthcare (secondary care) and only one input into overall hospital performance (management). We do not, for example, measure cost, life expectancy, equity or access to care.[3] Furthermore, one advantage of our management scores is that the survey is administered in a homogenous way across countries, whereas existing rankings are based on

[3] For example, a WHO (17) ranking of health system effectiveness was based on five criteria including the overall level of population health; health inequalities within the population; overall level of health system responsiveness; distribution of responsiveness with the population; and the distribution of the health system's financial burden within the population.

comparing administrative records or patients/experts perceptions across countries, which can often be difficult.

Almost half (46%) of the variation in management scores is across countries with the remaining 54% across hospitals within country. This suggests that national institutions are important in accounting for management. We return to these issues in section 7, where we discuss some institutional factors behind the cross country variation in management.

Exhibit 3 breaks down the management index into two sub-indices: "people" (questions over systematic appraisals, incentives to reward ability and effort, careful recruitment and addressing under-performance) and "operations" (logistics of patient flow, monitoring and targets). The gap between the US and other OECD countries is particularly large for people management. India and Brazil, on the other hand, lag behind across both areas.

Exhibit 4 plots the histogram of management practices (the bar-chart) for every country, alongside the distribution in the US for comparison (the solid black line). This shows considerable within country variation – even within the US sample there is much heterogeneity.

4. Do differences in management matter for hospital performance?

To investigate whether these differences in the management score matter, we examine the correlation of the scores with hospital outcomes. A standard measure of clinical quality is death rates from hospital AMI admissions (acute myocardial infarction, commonly called heart attacks).

AMI is a common emergency condition, recorded accurately and believed to be strongly influenced by the organization of hospital care (14).

The management scores are significantly correlated with (case-mix adjusted) 30-day AMI mortality measure. Exhibit 5 shows that a move from bottom third to top third of the management score is associated with a fall in AMI deaths of 0.41 standard deviations. At the mean of AMI mortality (16%) this implies a fall of 0.8 percentage points, i.e. 36 fewer people dying per year at the average hospital.[4] Note that these are within country estimates controlling for a wide variety of factors. Regressions in the Online Appendix (Table A1) show the results for each country (controls include case-mix, hospital size, skills and statistical noise controls (interviewer dummies, responding manager's seniority and tenure and interview duration). In the US financial performance is also significantly better in hospitals with a higher management score. Using English hospitals from 2006, Bloom et al (6) find a positive link between management and other good outcomes such as survival rates from general surgery, lower staff turnover and shorter length of stay.

These are only correlations so may not be causal. The results do indicate that hospitals like Virginia Mason, ThedaCare and Intermountain that are famous for adopting these types of management practices typically have better outcomes than others.

[4] McConnell et al. (15) using a similar methodology also found a highly significant relationship between management and lower 30-day risk adjusted AMI mortality in 597 US cardiac units.

5. What drives management differences within countries?

Exhibit 6 shows factors that seem to influence management practices. As in the previous section, these control for other factors that may influence management such as region of hospital location and hospital specialty. In Panel A we find that moving from the smallest to the largest third of hospitals is associated with an increase of management practices of 0.27 of a standard deviation. This size-management correlation could reflect economies of scale in management as it is likely that many of the formal management procedures we look at (like systematic appraisals, hiring and decisions, etc.) have a fixed cost element. It is also likely that bigger hospitals need more formalized management practices – as the hospital size grows it becomes increasingly hard to manage through informal "management by walking around". Finally, it may also reflect the fact that better managed hospitals attract more patients and become larger due their higher quality.

Panel B of Exhibit 6 shows that management scores are higher when the proportion of managers with clinical degree is higher. We also see this relationship when looking at changes in management and changes in the proportion of clinically trained managers in the UK in the 2006-2009 period (4). Similar results are also reported by Goodall (12), who reports that medically trained hospital CEOs were associated with better hospital outcomes than those who were not. Our result is consistent with this, except we are senior managers rather than just CEOs. One explanation for this is better communication - clinically trained managers may communicate more easily with medical staff. Another is information: clinically trained managers may better understand the medical side of the hospital and be able to make more effective decisions. In particular, they may be able to overrule powerful incumbents who object to needed re-organizations. Finally, this could reflect greater trust

– hospital employees may have more confidence in a physician as their manager. These results are interesting as many countries (like the UK) have moved in the opposite direction in recent years, encouraging many CEOs who are professionally trained outside medicine to take leading roles. It also suggests the MD/MBA may be a desirable qualification for hospital leaders.

Panel C shows that government run hospitals have lower scores than others (we find similar results in manufacturing and schools). It is unlikely to be the profit motivate that causes this result as for profit and not-for profit providers have similar scores. One explanation could be political interference makes managing hospitals effectively far harder. The different patient mix and treatments offered in public vs. private hospitals could be another explanation.

Panel D shows that hospitals that perceiving greater competition are better managed. One reason for this link is that facing other local rivals forces hospitals to become more efficient. Another explanation is that more competitors help hospitals to learn modern management practices from their neighbors. The results are robust to controlling for population density so it is unlikely that it is an urban effect. To probe whether competition has a causal effect Bloom et al (6) use exogenous variation in competition arising from the fact that hospitals are rarely closed when districts are politically marginal, generating quasi-random variation in the number of hospitals across identical UK areas. They found that the positive impact of competition on hospital management was robust.[5]

[5] In Britain hospitals are rarely closed down in politically marginal districts because the candidates of the ruling party are likely to be rejected by voters. Hence, other things being equal, there tends to be more hospitals per head (and therefore more competition) in politically marginal areas. This generates semi-random variation in hospitals numbers, which robustly predict better hospital management practices.

In summary, we find that size, managerial medical skills, private ownership and competition are key predictors of better management practices. Intriguingly, these results are similar for manufacturing, retail and education, suggesting that some common factors influencing management in disparate parts of the economy.

Finally, while the four factors identified in this section are extremely important in explaining the variation in management across hospitals within countries, they appear to explain much less of the cross-country differences.[6] We turn to the analysis of the possible drivers of the cross-country variation in management in Section 6.

6. What explains the variation in management across countries?

We only have nine countries, so we can only offer some qualitative reflections based on a broad overview of the structure of the health systems in our sample.

First, healthcare expenditure explains little of the country variation in management data. Sweden spends approximately 15% less than France in healthcare (as a % of gross domestic product), yet its management scores are 18% higher. The same is true of universal coverage offering, which is present in most of the countries in the sample except the US and India, either via National Health Systems (Canada, Italy and Sweden) or insurance schemes (France and Germany). Finally, countries are also similar in terms of the pervasiveness of not-for-profits (either public or private), which represents the majority of hospitals in all countries except in India.

6 For example, including the controls for hospital employment, skills, ownership and competition on average accounts for only 10% of the gap in the management score between the US and the other countries in our sample.

Countries differ a lot in accountability and governance of hospitals, which might play an important role for management. First, there are large differences in the extent to which hospital quality metrics (e.g. survival rates, infection rates, patient satisfaction etc.) are made visible to central authorities and patients, and are easily comparable across hospitals. RAND (7) reports the existence of wide variations across countries in terms of a) type of metrics collected; b) ways in which these metrics are made available to the public; c) ways in which these metrics are used by public authorities. For example, in Germany, Sweden, US and UK, hospital level data on clinical processes, quality of care and patient satisfaction are widely available, fully comparable, and have funding implications (e.g. UK). In contrast, countries such as Canada and France provide a much smaller set of hospital level metrics, which have limited implications for funding. In Italy, hospital level data of this type does not generally exist.

Second, countries differ widely in terms of governance, and more specifically the factors influencing the appointment of hospital CEOs. In France and Italy local politicians are in charge of the appointment of the CEOs (the local mayor in France and by the head of the regional government in Italy) of public hospitals. This introduces a channel through which local political cycles may interfere with the day by day management of hospitals and the selection of the managerial talent at the head of these organizations. In contrast, in countries such as the US and Germany political influence on CEO nominations is weakened by the higher prevalence of private owned hospitals, whose employees are not directly employed by the government. Sweden and the UK are interesting examples since they combine almost exclusive public ownership of hospitals with limited political influence on CEO nominations. In Sweden this is achieved through an extreme purchaser/provider split, with 20% of public hospitals run by private organizations. In the

UK NHS, the governance of hospitals is primarily managed through local hospital boards, which are made of non-political appointees.

7. Conclusions

Healthcare absorbs a large and growing fraction national income across the world. Consequently there is an enormous interest in improving healthcare productivity. We argue that management practices are one factor causing the enormous variation in hospital productivity and improved management can alleviate these pressures. We develop a survey for measuring some core hospital management practices that has been used successfully in other sectors of the economy and implement the survey through interviews of 2,000 hospitals in nine countries. We uncover huge variations in management quality within and between countries. Management scores are significantly correlated with hospital performance such as AMI survival rates.

There are features of hospitals that are systematically correlated with better management. Hospitals that are larger, who face greater competition, employ a larger share of clinically trained managers and who not owned by the government are significantly better managed. We speculate that the striking differences across countries reflect key institutional differences relating to the appointment of hospital leaders (i.e. whether politically independent or not) and accountability structures.

There is much work to do in understanding the underlying drivers of management and appropriate policies. We believe that, in a small way, our management measures may be a useful tool to analysts and practitioners in advancing this agenda.

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Exhibit 1 (Table): Hospital Characteristics Across Countries

Panel A. Hospital Size

Country	Number of Hospitals	Hospital Beds	Hospital Employment	% Managers with a clinical degree
Brazil	289	130.78	558.34	0.58
Canada	175	133.80	942.62	0.74
France	158	751.99	2244.68	0.64
Germany	130	400.91	933.28	0.71
India	493	151.17	370.40	0.54
Italy	166	395.72	1297.22	0.78
Sweden	56	306.98	2308.65	0.93
UK	184	370.37	2344.52	0.58
US	327	158.86	1117.20	0.74
Total	1978	256.46	1057.49	0.65

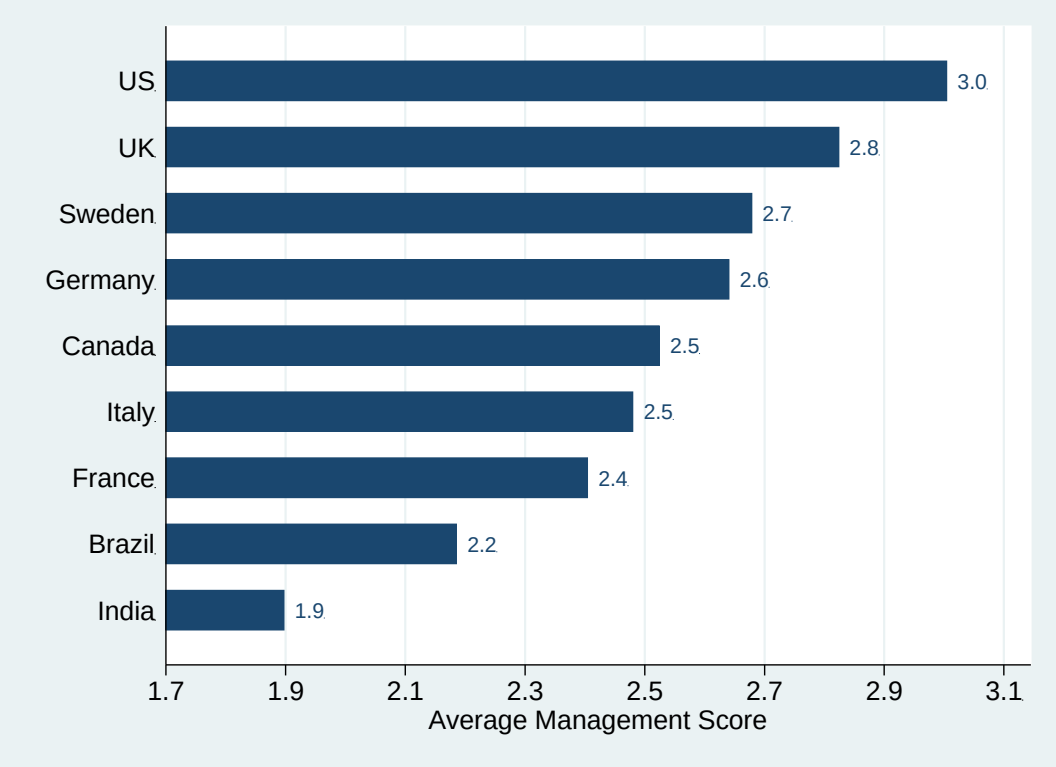
Panel B. Hospital Specialty

Country	Cardiology	Multi-Specialty	Orthopedics	Surgery	Other	Teaching Hospital
Brazil	0.03	0.00	0.07	0	0.4117647	0.12
Canada	0.07	0.61	0.09	0.17	0.06	0.10
France	0.41	0.13	0.20	0.15	0.11	0.23
Germany	0.02	0.86	0.05	0.04	0.02	0.42
India	0.10	0.51	0.39	0.00	0.00	0.16
Italy	0.03	0.67	0.29	0.01	0.00	0.09
Sweden	0.04	0.05	0.84	0.07	0.00	0.18
UK	0.20	0.32	0.32	0.13	0.03	0.14
US	0.16	0.52	0.09	0.19	0.04	0.16
Total	0.12	0.42	0.23	0.08	0.08	0.16

Panel C. Hospital Ownership

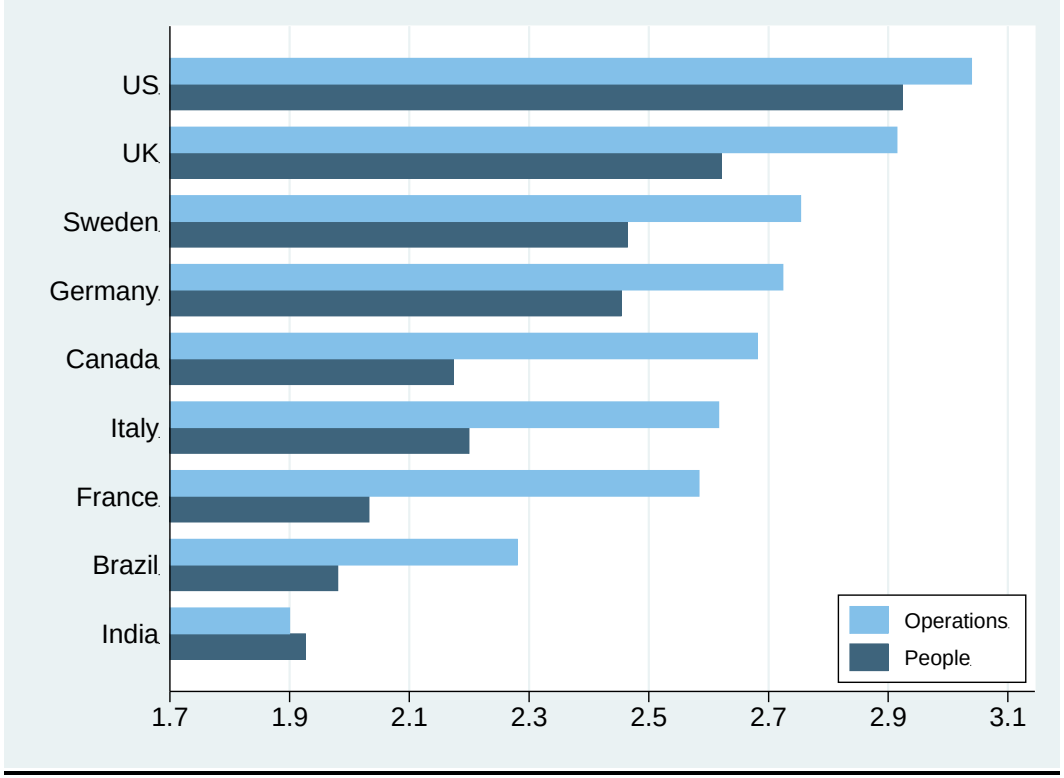
Country	Private, For Profit	Private, Not For Profit	Public
Brazil	0.11	0.51	0.38
Canada	0.01	0.02	0.98
France	0.11	0.02	0.87
Germany	0.15	0.37	0.48
India	0.84	0.10	0.06
Italy	0.16	0.04	0.80
Sweden	0.04	0.00	0.96
UK	0.26	0.09	0.65
US	0.13	0.37	0.50
Total	0.30	0.20	0.50

Exhibit 2 (Figure): Hospital Management Across Countries



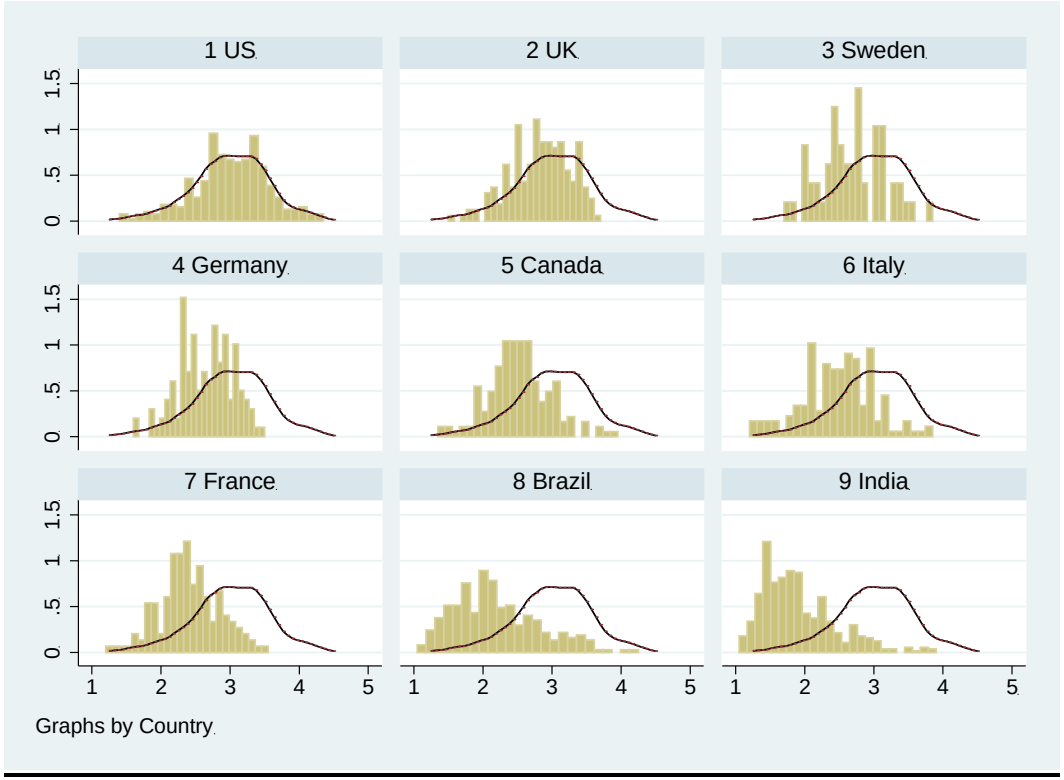
Notes: The bars represent the average management scores by country. The upper bar represents the raw data. The lower bar shows the averages controlling for hospital size (number of employees), specialty, percentage of managers with a clinical degree. Number of observations: 289 Brazil, 175 Canada, 158 France, 130 Germany, 493 India, 166 Italy, 56 Sweden, 184 UK and 327 U.S.

Exhibit 3 (Figure): Operations and People Management Across Countries



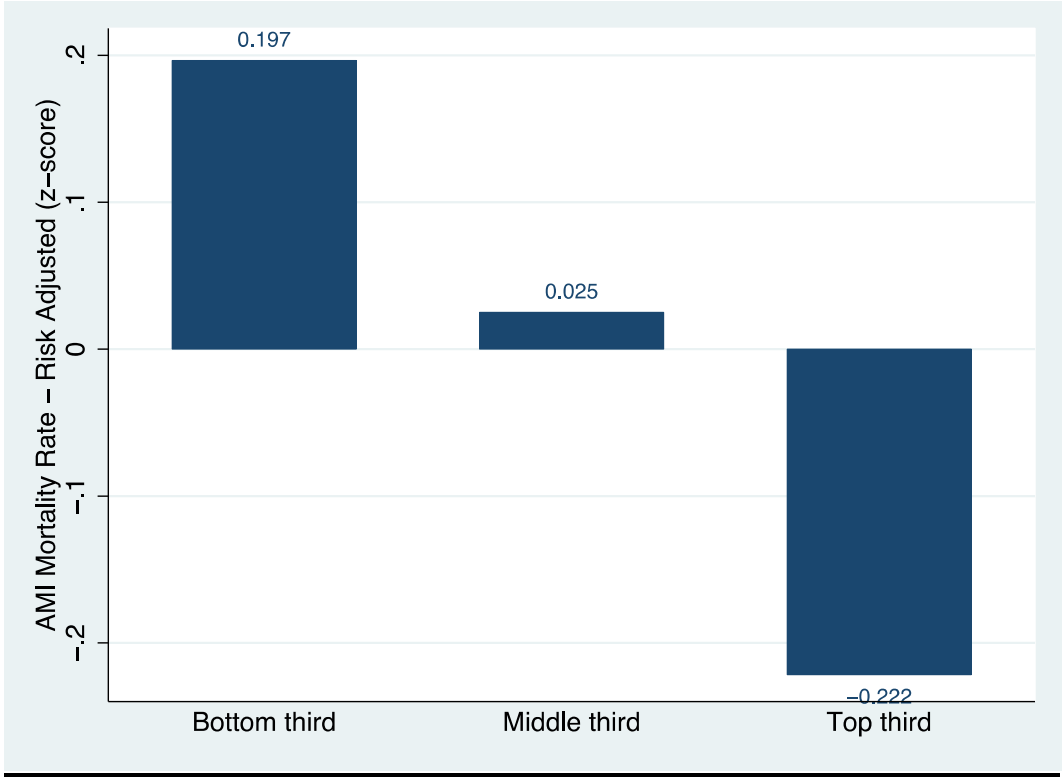
Notes: The bars represent the raw average management scores by country. The upper bars represent the averages for the 14 questions related to operations, monitoring and targets (defined as operation questions in the text) and the lower bars represent the averages for the 6 people management questions (see Appendix for more details on the questions). Number of observations: 289 Brazil, 175 Canada, 158 France, 130 Germany, 493 India, 166 Italy, 56 Sweden, 184 UK and 327 U.S.

Exhibit 4 (Figure): Hospital Management Within Countries



Notes: These are the distributions of the raw management scores (simple averages across all 20 practices for each hospital). 1 indicates worst practice, 5 indicates best practice. We overlay the outline of the US distribution across all countries for comparison. The countries are ordered according to their average country management score (from highest to lowest). Number of observations: 289 Brazil, 175 Canada, 158 France, 130 Germany, 493 India, 166 Italy, 56 Sweden, 184 UK and 327 U.S.

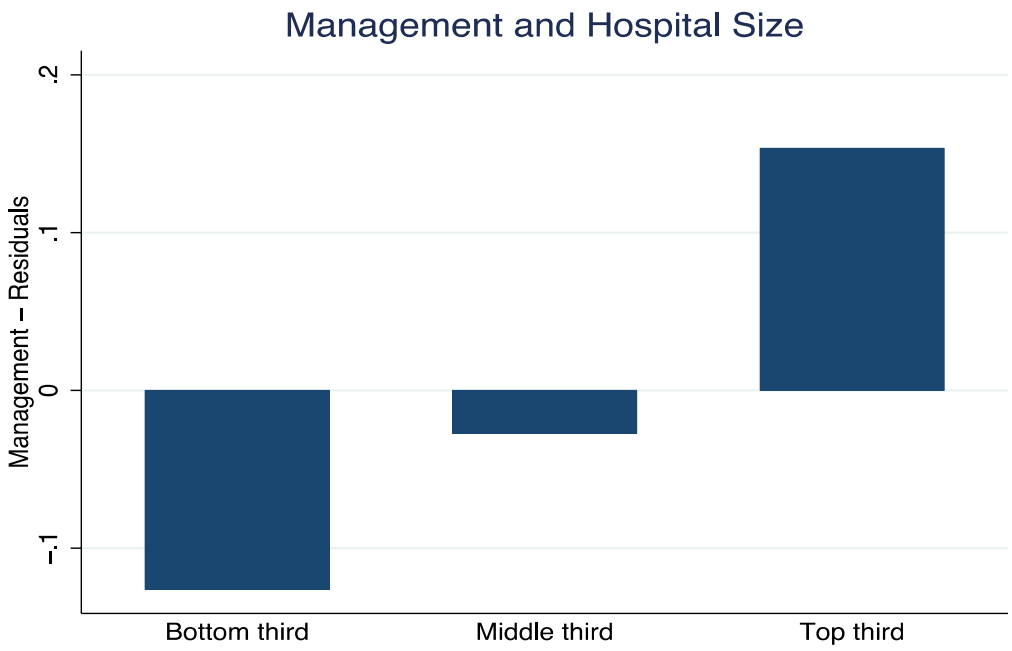
Exhibit 5 (Figure): Management and AMI Mortality Rates



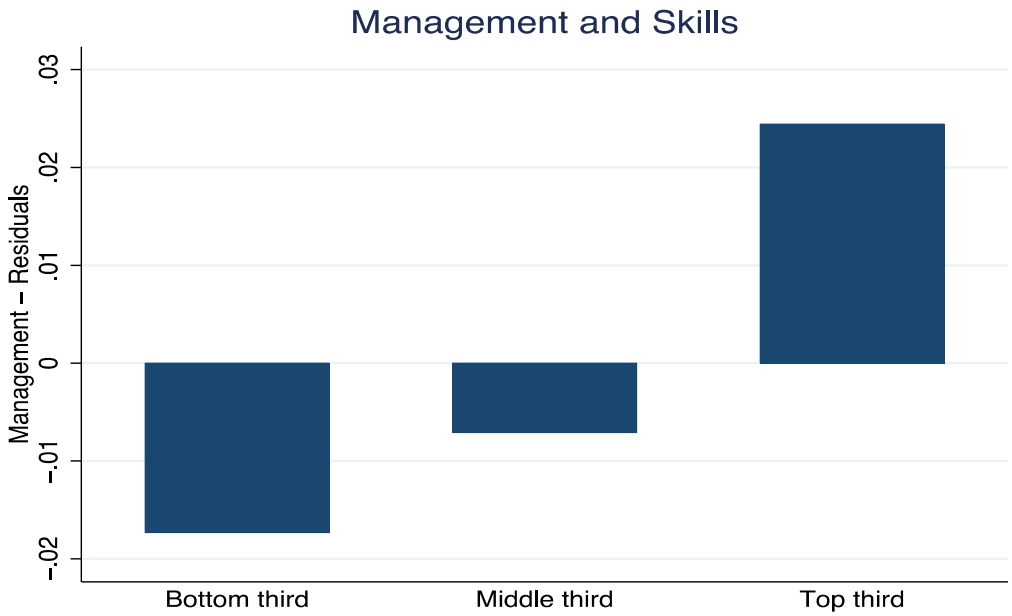
Notes: Based on 324 observations with available AMI information (Canada:29; Sweden: 48; UK: 74; US: 178). We z-score the AMI data within country to take into account differences in the way the AMI rates are calculated across countries, and keep only hospitals with at least 20 AMI cases in a year. For both AMI rates and Management, we take residuals from a regression including country dummies, hospital controls(number of employees, specialty, percentage of managers with a clinical degree), noise controls (13 interviewer dummies, the seniority and tenure of the manager who responded, the duration of the interview, and an indicator of the reliability of the information as coded by the interviewer, interviewee type) and regional dummies. AMI mortality rates data refer to 2009 in the US and UK, to 2008 in Sweden and the average between 2007 and 2009 in Canada. The p-value on the difference between the bottom and the middle tercile is 0.204; the p-value on the difference between the bottom and the top tercile is 0.001. The p-value on the difference between the middle and the top tercile is 0.07.

Exhibit 6 (Figure): Drivers of Management

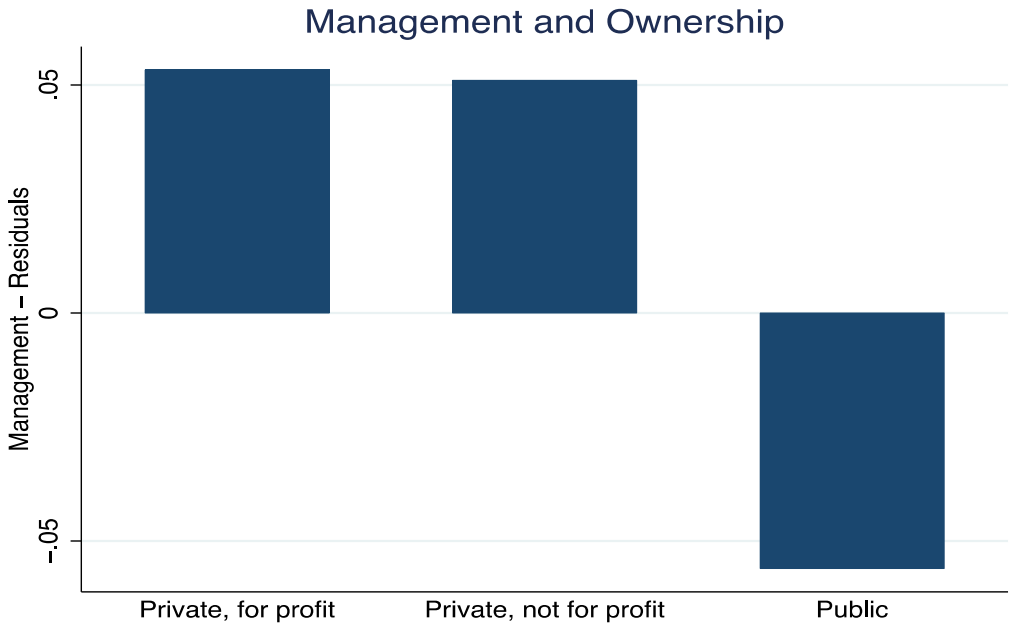
Panel A. Hospital Size



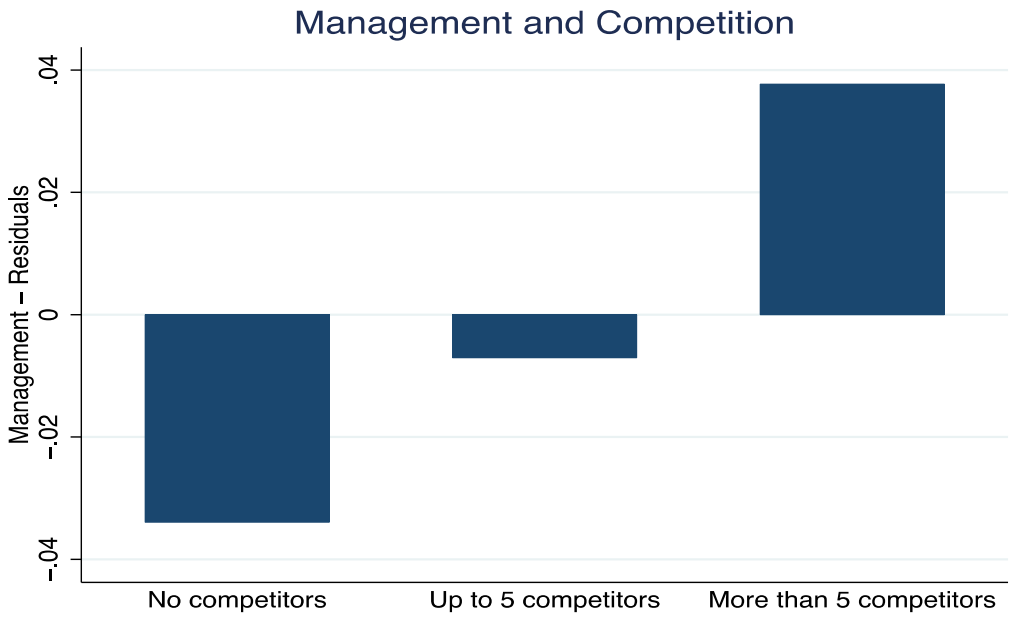
Panel B. Percentage Managers with A Clinical Degree



Panel C. Ownership



Panel D. Competition



Notes: The graph shows the relationship between management and different values of hospital employment, percentage of managers with a clinical degree, hospital ownership and competition (as reported by the interviewee). Panel A: For both management and hospital employment, we take residuals from a regression including country dummies, hospital specialty, noise controls

(13 interviewer dummies, the seniority and tenure of the manager who responded, the duration of the interview, and an indicator of the reliability of the information as coded by the interviewer, interviewee type) and regional dummies. Panel B: For both management and percentage of managers with a clinical degree, we take residuals from a regression including country dummies, hospital controls (number of employees, specialty), noise controls (13 interviewer dummies, the seniority and tenure of the manager who responded, the duration of the interview, and an indicator of the reliability of the information as coded by the interviewer, interviewee type) and regional dummies. Panel C and D: For management we take residuals from a regression including country dummies, hospital controls (number of employees, specialty), noise controls (13 interviewer dummies, the seniority and tenure of the manager who responded, the duration of the interview, and an indicator of the reliability of the information as coded by the interviewer, interviewee type) and regional dummies.

APPENDIX

As discussed in the text we present three additional tables. Appendix Exhibit 7 shows the questions in more detail. Appendix Exhibit 8 presents the hospital scores in each question in each country relative to manufacturing. Appendix Exhibit 9 presents the results of regressing AMI mortality rates on the management score and other controls. The first two columns do this for the pooled results across all countries and the next four columns do this for the individual countries (note that AMI data is only available at the hospital level for four countries). Appendix Exhibit 10 presents regressions where the management score is the dependent variable. Note that throughout management is z-scored so that the index has a mean zero and standard deviation of one.

Exhibit 7 (Appendix Table): List of management practice dimensions

This is a list of the 20 dimensions used to score hospital management practices. The first section (questions 1 to 9) focuses on operations and monitoring, the second section (questions 10 to 14) focuses on targets, and the last section (questions 15 to 20) focuses on incentives. The full scoring grid and detailed interview questions are available here: http://worldmanagementsurvey.org/wp-content/images/2011/01/Healthcare_Survey_Instrument_20110110.pdf

1) Layout of patient flow
2) Rationale for standardization and pathway management
3) Standardization and protocols
4) Good use of human resources
5) Continuous improvement
6) Performance tracking
7) Performance review
8) Performance dialogue
9) Consequence management
10) Target balance
11) Target interconnection
12) Time horizon of targets
13) Target stretch
14) Clarity and comparability of targets
15) Rewarding high performers
16) Addressing (fixing or removing) poor performers
17) Promoting high performers
18) Managing talent
19) Retaining talent
20) Attracting talent

Exhibit 8 (Appendix Table): Management Comparison Across Countries: Hospital average score relative to Manufacturing

Table A1: Management Comparison Across Countries: Hospital average score relative to Manufacturing

	Question	Description	Brazil	Canada	France	Germany	India	Italy	Sweden	UK	US	Total
1	**Continuous Improvement**	Tests processes for and attitudes towards continuous improvement, and whether learnings are captured and documented	0.82	0.89	0.89	0.83	0.80	0.83	0.88	0.95	0.95	0.87
2	**Performance Tracking**	Tests whether performance is tracked using meaningful metrics and with appropriate regularity	0.79	0.84	0.74	0.82	0.71	0.81	0.84	0.91	0.91	0.82
3	**Performance Review**	Tests whether performance is reviewed with appropriate frequency and communicated to staff	0.82	0.78	0.67	0.80	0.72	0.82	0.72	0.93	0.89	0.80
4	**Performance Dialogue**	Tests the quality of review conversations	0.79	0.79	0.75	0.81	0.72	0.81	0.87	0.93	0.89	0.82
5	**Consequence Management**	Tests whether differing levels of performance (NOT personal but plan/ process based) lead to different consequences	0.83	0.72	0.74	0.79	0.70	0.83	0.82	0.86	0.84	0.79
6	**Target Balance**	Tests whether targets cover a sufficiently broad set of metrics	0.81	0.95	0.71	0.83	0.66	0.78	0.93	0.96	0.96	0.84
7	**Target Inter-Connection**	Tests whether targets are tied to hospital objectives and how well they cascade down the organization	0.77	0.81	0.81	0.76	0.63	0.89	0.93	0.95	0.88	0.83
8	**Time Horizon of Targets**	Tests whether hospital has a '3 horizons' approach to planning and targets	0.84	0.76	0.72	0.74	0.58	0.63	0.74	0.87	0.87	0.75
9	**Target Stretch**	Tests whether targets are appropriately difficult to achieve	0.73	0.78	0.80	0.76	0.60	0.70	0.78	0.90	0.85	0.77

10	**Clarity and Comparability of Targets**	Tests how easily understandable performance measures are and whether performance is openly communicated	0.57	0.73	0.80	0.85	0.58	0.78	0.99	0.89	0.90	0.79
11	**Managing Talent**	Tests what emphasis is put on talent management	0.74	0.87	0.94	0.95	0.79	0.99	0.91	1.01	0.98	0.91
12	**Rewarding High Performers**	Tests whether good performance is rewarded proportionately	0.78	0.80	0.64	0.71	0.81	0.84	1.23	1.00	0.95	0.86
13	**Removing Poor Performers**	Tests whether hospital is able to deal with underperformers	0.84	0.61	0.71	0.82	0.78	0.72	0.81	0.82	0.87	0.78
14	**Promoting High Performers**	Tests whether promotion is performance based	0.67	0.64	0.57	0.78	0.70	0.65	0.64	0.94	0.89	0.72
15	**Attracting Talent**	Tests the strength of the employee value proposition	0.83	0.87	1.02	0.94	0.68	0.90	0.84	0.94	0.92	0.88
16	**Retaining Talent**	Tests whether hospital will go out of its way to keep its top talent	0.80	0.68	0.68	0.86	0.78	0.73	0.94	0.87	0.87	0.80

Notes: The table shows the average country scores for each of the questions relative to the manufacturing averages for the same question and country. Number of observations for hospitals: 289 Brazil, 175 Canada, 158 France, 130 Germany, 493 India, 166 Italy, 56 Sweden, 184 UK and 327 U.S. Number of observations for manufacturing: 479 Brazil, 273 Canada, 258 France, 323 Germany, 739 India, 244 Italy, 236 Sweden, 652 UK and 840 U.S. Number of observations for manufacturing: 273 Canada, 258 France, 323 Germany, 739 India, 244 Italy, 236 Sweden, 652 UK and 840 U.S.

Exhibit 9 (Appendix Table): Management and Hospital Performance (AMI mortality rates)

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable: Case mix adjusted AMI 30 days mortality rates (z-scored by country)						
Countries	**All**		**US**	**UK**	**Canada**	**Sweden**
Management (z-score)	-0.162***	-0.246***	-0.211**	-0.416*	-0.717**	-0.543***
	(0.056)	(0.075)	(0.100)	(0.224)	(0.316)	(0.193)
R-squared	0.023	0.230	0.242	0.193	0.690	0.689
Observations	324	324	178	74	24	48
Country dummies	y	y	y	y	y	y
Hospital controls	y	y	y	y	y	y
Region dummies		y	y	y	y	y
Noise controls		y	y	y	y	y

Notes. All columns estimated by OLS. In all columns standard errors are in parentheses under coefficient clustered by hospital. Hospital controls are hospital size (number of employees), specialty, and percentage of managers with a clinical degree. "Noise controls" are 13 interviewer dummies, the seniority and tenure of the manager who responded, the duration of the interview, and an indicator of the reliability of the information as coded by the interviewer, interviewee type (nurse, doctor or non clinical manager). AMI mortality rates data refer to 2009 in the US and UK, to 2008 in Sweden and the average between 2007 and 2009 in Canada (See Appendix A for details). All regressions except column 1 include a full set of regional dummies.

Exhibit 10 (Appendix Table): What affects Hospital Management?

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable	**Management (z-scored)**						
Sample	**All**					**OECD**	**Brazil & India**
Ln(Hospital Employment)	0.173***	0.173***	0.205***	0.171***	0.202***	0.154***	0.298***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.017)	(0.024)
Ln(% of Managers with a Clinical Degree)		0.221**			0.222**	0.279**	0.204*
		(0.090)			(0.089)	(0.127)	(0.119)
Dummy private for profit			0.352***		0.340***	0.406***	0.116
			(0.055)		(0.055)	(0.066)	(0.091)
Dummy private not for profit			0.283***		0.277***	0.308***	0.115
			(0.050)		(0.050)	(0.056)	(0.095)
Number of competitors				0.080***	0.051*	0.078**	0.010
				(0.027)	(0.027)	(0.032)	(0.046)
N	1978	1978	1978	1978	1978	1196	782
Country dummies	y	y	y	y	y	y	y
Hospital specialty	y	y	y	y	y	y	y
Region dummies	y	y	y	y	y	y	y
Noise controls	y	y	y	y	y	y	y

Notes. All columns estimated by OLS. In all columns standard errors are in parentheses under coefficient clustered by hospital. "Noise controls" are 13 interviewer dummies, the seniority and tenure of the manager who responded, the duration of the interview, and an indicator of the reliability of the information as coded by the interviewer, interviewee type (nurse, doctor or non clinical manager). Number of competitors is constructed from the response to the survey question on number of competitors, and is coded as zero for none (16% of responses), 1 for less than 5 (59% of responses), and 2 for "5 or more" (25% of responses). All regressions include a full set of regional dummies