From the boardroom to the bedside and back

A study on the relationship between hospital governance, quality management and the quality of care

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Systems awareness and systems design are important for health professionals. However, it are the ethical dimensions of individuals that are essential to a system's success. Ultimately, the secret of quality is love.

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General introduction
This thesis explores the relationship between hospital governance, quality management and quality of care. It focuses on how executive boards, boards of trustees and medical specialists fulfil their mutual and complementary responsibilities for realizing quality of care in acute care hospitals. What their responsibilities for quality of care exactly are, however, is not clearly defined in day-to-day practice. Thus far it is not clear what the underlying mechanisms are of realizing quality of care from the boardroom to the bedside and back. To get a better understanding of this complexity, quantitative and qualitative data were collected and analysed through a systematic review, surveys and in-depth interviews in Dutch hospitals and through an international mixed-method research project “Deepening our Understanding of Quality improvement in Europe (DUQuE)” focusing on European hospitals.

**Hospital governance**

With respect to governance of hospital care, two key concepts are being used: 1) hospital governance, and 2) clinical governance. In general, hospital governance refers to managing the hospital, whereas clinical governance refers to the management of clinical practice. These concepts are explained in further detail in the following paragraphs.

Hospital governance is one of the many concepts used in research on quality of care. However, as ambiguity of the concept of governance in health care organisations increases, it is more likely that strategic errors arise and that accountability and responsibility decrease [1]. This is surely the case for hospital governance due to the management-doctor relationship and the professional autonomy of doctors. Since it is important to agree on the concept of hospital governance, this thesis takes the following approach:

*Hospital governance is the division of tasks and responsibilities for the strategic direction for the hospital (mission, vision, values, goals) amongst the board of trustees, executive board and medical specialists, and using data to fulfil their role in monitoring and improving the hospital’s performance.*

Hospital governance in high income countries typically consists of three key components: executive board, board of trustees and medical staff. The executive
board is responsible for the daily management of the hospital, whilst the board of trustees has the responsibility to oversee their activities, and are entitled to hire and fire the CEO [1]. It depends on the governance model how they interact with and have influence on each other. The one-tiered model implies that members of the board of trustees (the non-executive board members) sit at the same table as the members of the executive board, resulting in a close working relationship between them [2]. In a two-tiered governance model, trustees have a more supervisory role that is more distant from the executives than in the one-tiered model. The medical staff is the body that represents the medical specialists in the hospital, and as such takes part in the decision making process with the executive board. In both one-tiered and two-tiered models, the role and influence of the medical staff is indisputably important. How clinical care is organised, can be explained through clinical governance.

Clinical governance is a concept that has its roots in the British National Health Service, and can be defined as “a system through which health care organisations are responsible for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in clinical care will flourish” [3]. This means that medical specialists play a pivotal role in dividing responsibilities, establishing procedures, sharing performance information about procedural effects and managing the organisation accordingly. In a previous study it was argued that involving medical specialists in middle management, e.g. as head of department, could lead to improvement strategies that are more relevant to clinical practice at pathway level and also more relevant to organizational-level management [4]. Besides, when organizations put in place formal communication channels and strategic controls, professionals become valuable allies in the innovation process [5-8]. Drawing medical specialist into management would therefore ease the tensional relationship, and ultimately enhance the performance of the hospital [9, 10].

Hospitals are under increasing scrutiny to achieve excellence in health care delivery. They must outperform their peers because of the pressures that come from market competition, free patient choice and health insurance companies, let alone from the Health Care Inspectorates. Since hospitals have the public assignment to facilitate high standard quality of care, quality performance should be one of the key focus areas within hospital governance. Where boards of trustees used to focus primarily on financial results, they are increasingly called upon to oversee other issues too, among others the quality of care. However, when the
value of care increases, i.e. the health outcomes achieved per euro spent, then patients and providers can benefit with economic sustainability of health care [11].

The focus areas of governance can depend on the board’s composition and task distribution. Although executive boards have the responsibility to make quality of care the organization’s top priority, several studies in the US showed that hospital governance primarily focuses on the hospital’s financial performance and reputation, and less on quality and safety issues [12-15]. A study of European hospitals showed that there are differences in the board taxonomy between hospitals, meaning that boards have taken up different types and numbers of tasks [16]. Boards that were so-called ‘in the driver’s seat’ had a large number of tasks that they were responsible for, while a board with a ‘low profile’ had few tasks to make decisions about. Some boards, for example, consider quality of care not to be their task, but that of the medical specialists.

In the governance of not-for-profit hospitals, boards of trustees are often struggling with the balance of overseeing the hospital on the one hand, and meddling too much in the executive boards’ affairs on the other. A principal–agent problem arises when executive board and the board of trustees have incongruent objectives and insufficient information is available to the board of trustees. Following the rationale of the agency theory, the board of trustees – the principal –, delegates responsibilities to perform certain tasks to the executive board – the agent – on their behalf [17]. In order for trustees to ascertain the main objective of the hospital, sufficient information should be at hand and actions should be taken accordingly. While hospitals are complex in many ways due to differing visions on autonomy and responsibility between medical and non-medical staff [18, 19], executive boards have the final responsibility for the quality performance of their hospitals. Executive boards play a pivotal role in creating a quality-oriented awareness throughout the hospital. Weiner and colleagues argued that “only senior leadership can establish quality as top priority, create a corporate culture for quality, and mobilize the financial and human resources necessary to support organizational learning” [20]. To that end, organizations and their executive boards are required to be committed to quality [21]. Not only the executive boards can have influence on the quality of care, a large-scale quantitative study in the US showed that boards of trustees of high-performing hospitals were more engaged with quality-related activities than in low-performing hospitals [12]. To overcome the principal-agent problem, a quality management system can contribute to a systematic approach of obtaining information and dividing responsibilities. How do hospital governance and
quality management relate? Research about the relationship between governance and quality management is at its infancy. In order to explore this relationship further, quality management first needs further clarification.

Quality management

According to Avedis Donabedian, performance is the result of how well structure, process and outcomes are in tune with the desired care [22]. This means that the care that is delivered by medical specialists, for example, is dependent on the organizational structure they work in. In other words, the management of care should contribute to ascertain and improve the quality of care. Another approach in managing the quality of care is Total Quality Management (TQM). TQM focuses on continuous quality improvement instead of mere inspection and control of the processes. Continuous quality improvement refers to the journey of hospitals learning about new knowledge and technologies, while exploiting the intellectual and social capital that already exist within the organization. In other words, continuous quality improvement means that a hospital learns how to learn [23]. There is a changing philosophy from inspection and control to the improvement of processes, mostly because quality performance became an important competitive factor. Additionally, quality control suggests that controlling is done after a product (care) is produced, while quality assurance reflects the common responsibility of both management and staff for setting goals and criteria for processes and outcomes [24]. Quality management can be defined as:

All activities of the overall management function that determine the quality policy, objectives and responsibilities and implementation by means such as quality planning, quality control, quality assurance and quality improvement, within the quality management system [25].

A quality management system supports the achievement of quality goals and is the organizational structure, responsibilities, procedures, processes and resources needed to assure and improve the quality of care. It is a system at the hospital level and typically applies to all departments, for example quality policy, quality resources, performance management, evidence-based management medicine and internal quality methods [26]. At department level, however, there are also forms of
quality management in terms of department-specific quality management activities, such as specialized expertise and responsibilities, evidence-based organisation of pathways, patient safety strategies and clinical reviews [27].

Quality management, at both hospital and department level, can be realized by means of the well-known Plan-Do-Check-Act cycle [28]. This approach suggests that improvement can be achieved when plans are developed and applied in practice, during which progress is monitored, while the monitoring data can then give ground to adjust the plan. This cyclic approach of improvement can be used repeatedly until satisfactory results are achieved. But how do governance and quality management influence the quality of care? And what exactly is quality of care?

Quality of care

The need for quality management is growing because of persisting evidence for practice variation [29], lack of accountability [30] and the occurrence of preventable medical errors [31]. Quality of care can be defined as:

*The degree to which the care provided by health care organizations for individuals and specific populations increases the likelihood of desired health outcomes and is consistent with current professional knowledge* [32].

Achieving quality of care entails more than desired outcomes, it also relates to safe, effective and patient-centred manner in which it is provided. Patient safety means that no harm caused by the health care system occurs to the patient. However, studies in various countries showed that harm, or adverse events, occurred in 7,5% of hospital admissions in Canadian hospitals [33], 11.1% in Portuguese hospitals [34], and 1,6% in Dutch hospitals [35]. Another aspect of quality is the effectiveness of treatments that are based on scientific knowledge and on needs. Patient-centred care means that the preferences of patients are taken into account. According to the transparency approach, the information about quality performance is used by patients to select their preferred supplier, and by Health Care Inspectorates to monitor the quality of care. Considering the aspects of hospital governance, quality management and quality of care, what do we know about hospital governance in the Netherlands?
Hospital governance in the Netherlands

In the Netherlands, hospitals are private not-for-profit organizations. The executive board has explicit responsibility for the quality of care. The executive board is headed by the Chief Executive Officer (CEO), and usually has a Chief Medical Officer (CMO) and a Chief Financial Officer (CFO) as its other members. The CMO has a special position in a hospital, since he has the responsibility of the whole hospital, but also represents the medical specialists due to his medical background. Besides the executive board, Dutch hospitals have a board of trustees that oversees the executive board’s actions. Hospitals also have a medical staff that represents all medical specialists within the hospital.

Medical specialists in general hospitals typically work as entrepreneurs within the hospital. In the 1970’s the rising health care costs necessitated the Dutch government to take action. After all, the government has the obligation towards their citizens to assure a minimum level of quality, but also to safeguard the country’s annual budget. As such, the payments for the delivered care became part of a shared budget for the hospital, necessitating the executive boards and medical specialists to increasingly collaborate. In the 1980’s, the government took a more distant position towards hospitals and the two-tier governance model became more professionalized. This model meant that an executive board would have the responsible for daily management of the hospitals, while a board of trustees oversees the executive board. The trustees were endorsed the task of overseeing the hospital. This transition made the executive board responsible for the quality of care. However, it was not explicitly specified how the responsibilities between the two boards should be divided in practice, and was left to the hospitals themselves to lay down in their own hospital regulations. At first, the two-tiered governance model was voluntary, but in 1996 the Care Institutions Quality Act (Kwaliteitswet Zorginstellingen) made it mandatory for hospitals to have effectuated this two-tier governance model in place. This Act also obligated hospitals to deliver responsible care, meaning that the care is effective, efficient and patient-centred.

In 2006, a major health care reform was realized that obliged citizens to be insured, but were free to change their health insurer once a year. The health insurers, which are for-profit organizations, negotiate contracts with hospitals annually and specify norms of financial and quality performance. The reform to work
towards a regulated market in the Dutch health care sector was expected to improve the quality of care, because on the one hand patients were now free to choose their preferred supplier, and health insurers would question hospitals on quality performance in the negotiations for contracts. Hence, better performance would lead to contracts with insurers and more patients, while poor performance would lead to fewer contracts and less patients. This system relies largely on transparency. After all, how can patients and insurers, but also hospitals themselves, make informed decisions without having sufficient information. This transparency requires data about performance to be accessible, but also to be reliable. Ascertaining reliable data requires good governance, because arrangements need to be made about who shares what information with whom, and when. Whether this is the case in practice, sharing performance-related information between medical staff, executive board and board of trustees, is one of the issues explored in this thesis.

When data about performance are not reliable and do not reflect the actual effectiveness of the delivered care, the executive boards are steering in the dark when they use these data. But how can executive boards fulfil their responsibilities and assure the quality of care? Thus far we know little of what boards actually do, especially in terms of promoting quality of care. So, for example, how much time is spent on quality during board meetings? Do they have a quality committee? Are board members aware of the current best practices and codes of conduct around quality and safety?

Since medical specialist play a pivotal role in allocating hospital resources, executive boards should increase the medical specialists’ involvement in governance to achieve the stated aims of quality performance [20]. Their involvement in governance can improve the communication between medical specialists and executives, and build trust by the medical staff that their goals and values are included in policy decisions [37]. Additionally, involving medical specialists in the development of quality improvement will lead to more support for it, especially by involving those who an improvement project will target [38]. Moreover, the involvement of medical specialists in quality improvement should also imply that they use quality of care data [20].

Every now and again, the media report on cases of mismanagement or dysfunctioning medical specialists in hospitals. In the Netherlands, the executive board in the Scheper Hospital in Emmen did not monitor the quality of care properly, which allowed a dysfunctioning hospital consultant to continue to
endanger patient safety [39]. Another example is the emergence of hospital bacterial infection at the Maasstad Hospital in Rotterdam, which was able to occur partially because both the hospital’s executive board and its board of trustees lacked a sufficient focus on the quality of care [40]. Despite all the regulations, codes, recommendations and guidelines on how to do it, why do we still see headlines popping up in the media about unsafe hospitals? Reports about these cases often start with the question: “Where does the responsibility of the medical specialist end, and where does it begin for the executives and trustees?” or “How come nobody noticed this failure, or acted upon it sufficiently?”

**Conceptual model**

The main goal of quality management is to improve the quality of care. To that end, the quality management system is developed to ensure various aspects of the improvement cycle, such as addressing responsibilities, optimizing process management, enhancing human resources (continuous training), ensuring leadership commitment, and analysing and monitoring the quality performance [36]. Many people working in hospitals play a pivotal role in quality management. In short, one could say that the CEO promotes the importance of quality, that department heads translate the hospital-wide quality orientation into quality activities, that medical specialists deliver quality care and provide information about quality performance, which in turn is used by department heads and CEOs to improve quality policy.

As can be seen in Figure 1, we expect that the policy of the board about the quality of care is carried out into the organization and influences the way quality management activities are prioritized and executed. We also expect that quality management has an effect on quality improvement, and requires the information about quality performance to optimize the improvement activities. The information about improvement processes and the outcome of quality performance are supposed to be discussed and acted upon in the boardroom. To test these assumptions, the main research question of this thesis was:
How does the executive board’s policy follow through to the quality performance at the bedside, and does the information about this performance reach the boardroom for them to optimize their policy?

**Figure 1** Conceptual model
(The numbers 1-5 refer to the research questions and their concomitant Chapters)

To answer the question how hospital governance influences the quality of care, we used the hospital sector in the Netherlands as a test case.

**Research questions and outline of the thesis**

This thesis will discuss the relationship between hospital governance, quality management and the quality of care. In order to get a better understanding of the underlying mechanisms of these relationships, we will start off by looking at hospital governance in the Netherlands and by investigating if it affects quality of care. To that end, we formulated the following research question:
1. How has hospital governance taken shape in the Netherlands and does it affect quality performance?

To answer this question we analysed public reports and policy briefs to ascertain the development of hospital governance in the Netherlands. We collected data about the quality performance of hospitals from the website of the Health Care Inspectorate (www.ziekenhuizentransparant.nl). In addition, we sent questionnaires to the CEOs and the chair of the boards of trustees of all Dutch hospitals at the end of 2010 to determine their orientation towards quality of care. The findings from 40 CEOs and 38 chairs of the board of trustees are explained in Chapter 1.

It is, however, unclear how medical specialists and executive boards meet their responsibilities and share information about patient care. Therefore, we aimed to describe the clinical governance structure in the Netherlands and to explore to what extent codes of conduct are practiced. This leads to the second research question of this thesis:

2. To what extent do medical specialists share information with the executive boards, and how are responsibilities for clinical governance divided?

To gain insight in the clinical governance in Dutch hospitals we first investigated policy documents to get a better understanding of its historical development. Subsequently, we sent questionnaires to hospital CEOs and the chairs of the medical staff boards of all hospitals at the end of 2010 to determine to what degree hospitals comply to the codes of conduct, and to what extent executive boards and medical specialists share information and divide clinical governance tasks. The results of responses of 40 CEOs and 67 chairs of the medical staff boards are presented in Chapter 2. But how do hospitals manage quality of care?

Health care providers invest substantial resources to establish and implement hospital quality management systems. Nevertheless, few tools are available to assess implementation efforts and their effect on quality and safety outcomes. The third research question is:

3. How can the implementation of quality management systems be assessed?
By performing a systematic review of international literature in the midst of 2011 we were able to give an overview of instruments that assessed the implementation of quality management systems, and to describe the reported effects of quality management systems on quality of care outcomes. In Chapter 3 these results are presented.

There are different ways to assess quality management systems, but whichever assessment was used, the implementation of quality management systems appeared to differ between hospitals. Thus far, it remains unclear why the implementation of quality management systems differs. Since the quality agenda is considered to be the starting point of prioritization and decision-making, and having quality on the agenda should allow executive boards to review and discuss the quality and performance of the services they deliver to patients, we expected that there might be a relation between the board’s quality agenda and the implementation of quality management systems. The fourth question is therefore as follows:

4. What is the association between the board’s quality agenda and the implementation of quality management systems

As part of the DUQuE Project (Deepening our Understanding of Quality improvement in Europe), we sent questionnaires to CEOs and quality managers between 2011 and 2012 to investigate the degree to which executive boards are oriented towards quality of care, and to what extent their quality management systems were implemented. Findings from seven European countries (Czech Republic, France, Germany, Poland, Portugal, Spain, and Turkey) are presented in Chapter 4.

In the Netherlands, performance indicators are being used for external accountability, such as public reporting, contracting with insurers and information for patients to choose their preferred provider. Performance indicators can potentially fit well in the PDCA cycle for internal quality management. But for quality management to be effective, the data for performance indicators should be reliable and usable. Therefore, our aim was to investigate how Dutch hospitals collect data of performance indicators for external accountability and to what extent these data are also used for internal quality management. We developed the following research question:
5. What are the arrangements for data collection of performance indicators for external accountability in Dutch hospitals, and how is it used for internal quality management?

In 2012, we interviewed 72 quality managers, medical specialists and nurses in 14 hospitals about the data collection process of performance indicators for external accountability on the one hand, and how it was used for internal quality management on the other.

**Table 1** Outline of the thesis

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Research aim</th>
<th>Design</th>
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<tbody>
<tr>
<td>Chapter 1</td>
<td>To describe hospital governance in the Netherlands and to investigate the relationship with hospital performance.</td>
<td>A quantitative study based on a web-based survey and document analysis.</td>
</tr>
<tr>
<td>Chapter 2</td>
<td>To explore whether clinical governance has been taken up by executive boards and medical specialists in the Netherlands.</td>
<td>A quantitative study based on a web-based survey.</td>
</tr>
<tr>
<td>Chapter 3</td>
<td>To identify 1) instruments to assess the implementation of hospital quality management systems and 2) the effects of quality management on quality improvement and quality of care outcomes.</td>
<td>A systematic literature review.</td>
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<tr>
<td>Chapter 4</td>
<td>To assess the relationship between having quality as an item on the executive board’s agenda and the implementation of quality management in European hospitals.</td>
<td>A mixed method study based on web-based surveys and onsite audits.</td>
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<tr>
<td>Chapter 5</td>
<td>To explore the hospitals’ use of performance indicators for internal quality management activities.</td>
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This thesis is divided into seven chapters. Chapters 1 to 5 present the results of the abovementioned studies (Table 1). In the light of methodological limitations and state of the art scientific literature, the findings of these studies are discussed in the general discussion, and recommendations for both research and practice are provided.


References


Botje D, Klazinga NS, Wagner C. To what degree is the governance of Dutch hospitals oriented towards quality of care? Does this really affect performance? Health Policy, 2013; 113: 134-141.
Hospital governance in the Netherlands

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Abstract

Introduction
Changing health care systems and market competition requires executive boards to shift their focus towards a systematic governance of the quality of care. The objective of our study was to describe hospital governance and the quality orientation in the Netherlands. Also we wished to investigate the relationship with hospital performance.

Materials and methods
The chairs of both the boards of trustees and the executive boards from all 97 Dutch hospitals were asked to participate in a cross-sectional study between November 2010 and February 2011. In this period data on their quality orientation were collected using a web-based survey. Data on hospital performance over the year 2010 were obtained in July 2011.

Results
A mixture of reforms and national guidelines increased the emphasis on quality governance in Dutch hospitals. Our results show that boards of trustees and executive boards had a reasonable quality orientation. Boards were familiar with quality guidelines, received a reasonable amount of information related to quality and used this for monitoring quality and policy-making. However, we found no association between their quality orientation and hospital performance.

Conclusion
There was a growing awareness of the quality of care among boards of trustees and executive boards; yet some boards still lagged behind. Quality orientation is an important asset because receiving, reviewing and responding to the quality of their performance should provide opportunities to improve quality. However, we were not able to find a relationship between quality orientation and hospital performance. Future research should investigate how boards can develop quality management systems which in turn could enable medical specialists to optimize their delivery of care and thus its quality.
1.1 Introduction

Hospitals are under increasing scrutiny to improve their quality of care because of the changing health care system and its increasing need for transparency [1]. This is a challenge for the hospitals governing bodies. In general, boards of management are responsible for the daily running of the hospital, while it is the responsibility of the board of trustees to oversee and evaluate their activities and to hire and fire the chief executive officer (CEO) [2]. Increasingly, hospital managers are held responsible if doubts arise over the quality and safety of care. There have been many examples of incidents in the media that emphasise the role of hospital governance in the quality of care. In the UK there is the case of the Staffordshire Hospital, where the Foundation Trust’s management was criticised for the high mortality rates. In the Netherlands, the executive board in the Scheper Hospital in Emmen did not monitor the quality of care properly, which allowed a dysfunctioning hospital consultant to continue to endanger patient safety [3]. Another example is the emergence of hospital bacterial infection at the Maasstad Hospital in Rotterdam, which was able to occur partially because both the hospital’s executive board and its board of trustees lacked a sufficient focus on the quality of care [4]. Since these scandals still seem to occur due to failing hospital governance, we investigated how hospital governance in the Netherlands has taken shape and to what extent executive boards are orientated towards quality.

Following the rationale of the agency theory, the board of trustees, that is the principal, delegates responsibilities to perform certain tasks to the executive board – the agent – on their behalf [5]. A principal–agent problem arises when both boards have incongruent objectives and insufficient information is available to the board of trustees. In order for these boards to ascertain the main objective of the hospital, sufficient information should be at hand and actions should be taken accordingly. However, the relationship between a hospital’s board of trustees, and its executive board, is not well understood. Neither is their influence on the quality of care.

The processes of governance towards quality of care can best be understood by developing a new governance model that is inspired by Deming’s well-established plan-do-check-act cycle (Figure 1.1). As such, in the planning stage the board of trustees requests the executive board to deliver sufficient information about the performance on quality-related issues. This information can be summarized and presented in a so-called quality ‘dashboard’, a management tool containing a variety of indicators. The content of these dashboards necessitates medical specialists to
register, precisely and accurately, the care delivered and to collate these data. The board of trustees in turn, makes sure they actually receive this information. Information can also be obtained by having direct contact with medical specialists during walk rounds. Once the information about quality performance is at hand, they then need to review and discuss the information in order to identify important signals indicating the quality of performance. Which topics are reviewed during board meetings will depend on how the agenda is set, which reflects the priorities it sets in decision-making [6]. Subsequently, the board can respond by emphasising advice to the executive board, by pre-empting relevant management tasks, or ultimately by firing the CEO. By reviewing quality performance trustees can improve quality because it provides an insight into what is required.

Business studies have shown that emphasising quality is a prerequisite to improving business performance [7]. This is because those businesses are more likely to develop effective learning mechanisms [8]. In health care research too, accumulating evidence shows the importance of prudent hospital governance for the quality of care. Several studies found associations between quality performance and a range of initiatives. These included: establishing a strategic goal for quality improvement; having quality performance on the agenda of board meetings; monitoring quality dashboards; and having a quality committee [9–12]. Additionally, the engagement of CEOs in quality was associated with the success of quality improvement projects [13]. Jha and Epstein found that in high-performing hospitals, the board of trustees used quality performance as a factor to evaluate the CEO’s performance [14]. They also found that those boards of trustees spent more time on

![Figure 1.1](image.png)
quality performance during meetings and perceived quality to be an important aspect of governance. However, most studies on hospital governance have been carried out in the US, and little is known about the quality orientation of boards in Dutch hospitals. It is important to know to extent the two boards are oriented towards quality of care, especially as they are responsible for this.

Our study aimed to determine, firstly, how hospital governance has taken shape in the Netherlands. Secondly, we wished to identify the extent to which boards of trustees and executive boards are orientated towards quality. Thirdly, we investigated how far this quality orientation affected hospital performance.

1.2 Materials and methods

1.2.1 Hospital governance in the Netherlands

We used reports and policy guidelines published by the Dutch Health Care Inspectorate (IGZ) and the Council for Public Health and Health Care (RvZ), among others, to ascertain how hospital governance has developed.

1.2.2 Quality orientation

Participants
All 97 Dutch hospitals participated in our cross-sectional quantitative study. All hospitals are private, non-profit organisations, eight of which are university hospitals. For each hospital, the chair of the trustees and the CEO, who is the chair of the executive board, were invited to participate.

Data collection
Data were collected on the degree of quality orientation and hospital performance on quality indicators.

Survey development to measure quality orientation
The respondents were asked in questionnaires to indicate their board’s orientation towards quality of care. One part of the questionnaire was based on a survey that was developed by Jha and Epstein [14], and translated into Dutch. Minor
adjustments were made to fit the Dutch health care setting. The other part was used to indicate which type of information was received and used by the boards.

Following the governance model (see Figure 1.1), the “request” element was determined by the familiarity with national quality governance programmes and how the importance of quality was perceived. The “receive” element was reflected by the type of information that was provided to the boards. The frequency in which quality appeared on the boards’ agenda reflects the “review” element. The “respond” element for the trustees relates to the topics that were discussed during meetings with the executive board and also to the use of quality performance as a factor for the evaluation of the CEO by the trustees. For the executive board, “respond” means using information related to quality for policy-making.

1.2.3 Hospital performance on process indicators

Indicators to measure quality performance can be categorised according to Donabedian’s structure–process–outcome paradigm [15]. We chose to focus on process indicators because hospital leadership is more likely to influence processes rather than outcomes, which are more the domain of medical specialists [16]. These indicators too are used extensively by insurers, patient organisations and the media to determine a hospital’s quality performance. We accept that process indicators, measuring solely quantitatively, do not capture the complete quality of care delivered [17]. However, we used this as a proxy for hospital performance as it was beyond the scope of this study to complement it with qualitative interviews.

Hospital performance data comprised seven process indicators. These included: pain measurements after surgery; stroke patients treated with thrombolysis within one hour after admission; hip fracture patients having surgery within 24 h after admission; pneumonia patients receiving antibiotic therapy within 4 h after admission; and gastrointestinal and liver patients having endoscopy within 24 h after admission. Hospitals are obliged to report these data to the central database of the Dutch Health Care Inspectorate [18], which become available on the website www.ziekenhuizentransparant.nl in the following year. For each process indicator, the level of compliance with recommended care was expressed in percentages, ranging from 0% (below par) to 100% (recommended care delivered to all patients). For each hospital the composite measure for performance was determined by calculating the average of the seven process indicators. We used multiple imputations to correct for missing values. We compared the performance of the
hospitals in our sample with the performance of all Dutch hospitals. The performance of our sample did not differ from all hospitals.

1.2.4 Procedure

Between November 2010 and February 2011, web-based questionnaires were sent to the chairs of trustees and the CEOs of 97 hospitals. Respondents received reminders after two and four weeks. During the research project, four hospitals merged into two hospitals. Out of 95 hospitals we received questionnaires from 54 different hospitals: 38 chairs of the trustees (RR = 40%) and 40 CEOs (RR = 42%). From the 54 hospitals in our sample, we received questionnaires from both respondents from 22 hospitals. Hospital performance data in 2010 were collected from the website of the Health Care Inspectorate in July 2011 [18].

1.2.5 Data analysis

To answer the second research question, the answers to the questionnaires were analysed using descriptive statistics. Associative analyses were done to find any relationships between single items. To answer the third research question, responses to the questionnaires were compared between the top 25% and bottom 25% hospitals for each respondent group using Student’s t-tests for continuous items and Chi-squared distributions for dichotomous items in the questionnaire. To determine statistical differences, the level of significance was set at 5%. Statistical analyses were performed in Stata/SE 11.0 for Windows.

1.3 Results

1.3.1 Hospital governance in the Netherlands

In the decentralised health care system, the governmental inference gradually decreased since the 80s, requiring internal oversight bodies, the boards of trustees, to increasingly challenge and support executive boards. Dutch hospitals are private, non-profit organisations and their governance structure reflects a “two-tier model” that is similar to a corporate model. This means that the role of the trustees is more
at arm’s length and independent, and that they primarily oversee and evaluate the executive board.

Hospital performance therefore became the responsibility of the trustees too, which required them to have good insight in performance. With the introduction of the Integration Act (Stb, 1999, 271) in 2000, the final responsibility for the quality of care was assigned to the executive board. In order to provide some means of addressing the division of responsibilities for the quality of care, national guidelines were introduced to clarify the roles respectively of the trustees and the executive board. These guideline follow the same principle as European guidelines in general, namely to comply or explain. In 2009, the Council for Public Health and Health Care (RvZ) and the Health Care Inspectorate (IGZ) stated that the executive board has final responsibility for the quality and safety of care [19, 20]. The joint Health Care Sector Organisations (BoZ) have established rules for good management and supervision in the 2010 Care-wide Governance Code [21]. They describe which tasks, and methods of working, of the trustees and the executive board, contribute to good management and responsible care. A role is laid down here for trustees and the executive board to share information related to the quality of care [22].

While hospital governance is important, it does not occur in a vacuum. All hospitals are part of a wider health care system. The Dutch Health Care Authority (NZa) oversees the insurance and provider markets, while the IGZ sets and monitors minimal quality standards. The role of the IGZ and the emphasis on trustees’ responsibility and accountability towards quality increases. In 2006, the Health Insurance Act reformed the health care system into a regulated market competition. This reform required care providers and health insurers to negotiate over quality. It was geared towards selective contracting with powerful incentives for hospitals to improve their performance [23]. The effect of market competition on hospital performance, however, depends largely on the level of transparency and the ability of patients to select their preferred care provider and/or health insurer [24]. Dutch citizens are obliged to have health insurance but they are free to choose their preferred insurer and provider [25]. However, 3–4% of the consumers switched between insurers per year since 2007 [26]. This means that there does not seem to be a business case for quality among health insurers; negotiations seem to revolve around costs [27].
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### Table 1.1: Quality orientation of 38 boards of trustees in the Netherlands

<table>
<thead>
<tr>
<th>Importance of the quality of care</th>
<th>N</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(^{st}) most important</td>
<td>13</td>
<td>(34)</td>
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<tr>
<td>2(^{nd}) most important</td>
<td>12</td>
<td>(32)</td>
</tr>
<tr>
<td>3(^{rd}) most important</td>
<td>8</td>
<td>(21)</td>
</tr>
<tr>
<td>Not important</td>
<td>5</td>
<td>(13)</td>
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</table>

<table>
<thead>
<tr>
<th>Familiarity with national quality programmes</th>
<th>N</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensive</td>
<td>17</td>
<td>(45)</td>
</tr>
<tr>
<td>Moderate</td>
<td>18</td>
<td>(47)</td>
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<tr>
<td>Limited</td>
<td>3</td>
<td>(8 )</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of information received</th>
<th>N</th>
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</tr>
</thead>
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<td>Number and results from improvement paths/projects</td>
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<td>(92)</td>
</tr>
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<td>Nature and extent of incidents/disasters</td>
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<tr>
<td>Results of quality inspections</td>
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<td>(84)</td>
</tr>
<tr>
<td>Number and type of treatment</td>
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<td>(74)</td>
</tr>
<tr>
<td>Mortality rates</td>
<td>26</td>
<td>(68)</td>
</tr>
<tr>
<td>Results of patient satisfaction surveys</td>
<td>26</td>
<td>(68)</td>
</tr>
<tr>
<td>Nature and extent of complications</td>
<td>24</td>
<td>(63)</td>
</tr>
<tr>
<td>Quality of the treatments carried out</td>
<td>20</td>
<td>(53)</td>
</tr>
</tbody>
</table>

- Table 1.1 continues –
Table 1.1 summarises the quality orientation of 38 boards of trustees. Thirty-five boards of trustees (92%) had quality on the agenda at every meeting, while two boards (5%) never use them during those meetings. Further analyses showed that boards which discussed quality during every meeting by 10 executive boards (25%) had higher self-reported expertise in quality management (p < .01). The trustees also had better alignment with the majority of the boards of trustees, for example concerning the improvement of the governance model, information on many quality-related topics were received by the 38 chairs of the trustees (92%) indicated they were at least moderately familiar with programmes and reports on governance. In line with the rationale of either urban or rural, the hospitals participating were considered to be representative to all Dutch hospitals regarding characteristics such as location, number of beds and personnel, or their annual income.

### The frequency quality appears on the agenda of board meetings

<table>
<thead>
<tr>
<th>Frequency</th>
<th>N</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every meeting</td>
<td>10</td>
<td>(26)</td>
</tr>
<tr>
<td>Most meetings</td>
<td>20</td>
<td>(53)</td>
</tr>
<tr>
<td>Some meetings</td>
<td>6</td>
<td>(16)</td>
</tr>
<tr>
<td>Few meetings</td>
<td>2</td>
<td>(5 )</td>
</tr>
<tr>
<td>Never on the agenda</td>
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<td>(0 )</td>
</tr>
</tbody>
</table>

### Importance of quality performance during CEO evaluation

<table>
<thead>
<tr>
<th>Importance</th>
<th>N</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st most important</td>
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<td>(24)</td>
</tr>
<tr>
<td>2nd most important</td>
<td>12</td>
<td>(32)</td>
</tr>
<tr>
<td>3rd most important</td>
<td>9</td>
<td>(24)</td>
</tr>
<tr>
<td>Not important</td>
<td>8</td>
<td>(21)</td>
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### Topics discussed during meetings with executive board

<table>
<thead>
<tr>
<th>Topic</th>
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<th>Few meetings</th>
<th>Some meetings</th>
<th>Most meetings</th>
<th>Every meeting</th>
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</thead>
<tbody>
<tr>
<td>Quality of care indicators</td>
<td>1 (3)</td>
<td>4 (11)</td>
<td>14 (37)</td>
<td>15 (39)</td>
<td>4 (11)</td>
</tr>
<tr>
<td>Progress of quality improvement projects</td>
<td>0 (0)</td>
<td>4 (11)</td>
<td>15 (39)</td>
<td>16 (42)</td>
<td>3 (8)</td>
</tr>
<tr>
<td>Dysfunctioning of medical specialists</td>
<td>1 (3)</td>
<td>5 (13)</td>
<td>19 (50)</td>
<td>11 (29)</td>
<td>2 (5)</td>
</tr>
<tr>
<td>Accreditation</td>
<td>2 (5)</td>
<td>5 (13)</td>
<td>19 (50)</td>
<td>11 (29)</td>
<td>1 (3)</td>
</tr>
<tr>
<td>Results of patient satisfaction surveys</td>
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<td>9 (24)</td>
<td>23 (61)</td>
<td>5 (13)</td>
<td>1 (3)</td>
</tr>
<tr>
<td>Nature and extent of adverse events</td>
<td>5 (13)</td>
<td>16 (42)</td>
<td>11 (29)</td>
<td>6 (16)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Battlenecks with applying protocols and guidelines</td>
<td>7 (18)</td>
<td>16 (42)</td>
<td>15 (39)</td>
<td>1 (3)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>
1.3.2 Quality orientation of trustees and executive boards

The hospitals participating were considered to be representative to all Dutch hospitals regarding characteristics such as location – either urban or rural, the number of beds and personnel, or their annual income.

Table 1.1 summarises the quality orientation of 38 boards of trustees. Thirty-five of the 38 chairs of the trustees (92%) indicated they were at least moderately familiar with programmes and reports on governance. In line with the rationale of the governance model, information on many quality-related topics were received by the majority of the boards of trustees, for example concerning the improvement projects (N = 35; 92%) or about incidents and disasters (N = 32; 84%). Ten boards of trustees (26%) had quality on the agenda at every meeting, while two boards (5%) only discussed quality during a few meetings. According to seven boards of trustees (18%), dashboards and balance scorecards were discussed during every meeting with the executive board, while seven other boards of trustees indicated that they never use them during those meetings. Further analyses showed that boards which had quality on the agenda at every meeting had higher self-reported expertise in quality management (p < .01). The trustees also had better alignment with the executive board about accountability and responsibility for the quality of care (p = .03) than those who discussed quality less often (p = .01).

Table 1.2 summarises the quality orientation of 40 executive boards. According to 13 CEOs (33%), quality of care was the most important topic of their executive board. Many executive boards received various types of quality-related information such as results of quality inspections (90%), the nature and extent of incidents or disasters (78%) and mortality rates (53%), among others. Quality was discussed during every meeting by 10 executive boards (25%). For policy-making, 36 executive boards used the results from quality inspections (90%), 35 boards used the nature and extent of incidents or disasters (88%), while 20 boards used the nature and extent of complications (60%).
Table 1.2: Quality orientation of 40 executive boards in the Netherlands

<table>
<thead>
<tr>
<th>Importance of the quality of care</th>
<th>N</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; most important</td>
<td>13</td>
<td>(33)</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; most important</td>
<td>11</td>
<td>(28)</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; most important</td>
<td>12</td>
<td>(30)</td>
</tr>
<tr>
<td>Not important</td>
<td>4</td>
<td>(10)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Familiarity with national quality programmes</th>
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<tr>
<td>Extensive</td>
<td>25</td>
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</tr>
<tr>
<td>Moderate</td>
<td>13</td>
<td>(33)</td>
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<tr>
<td>Limited</td>
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<td>(5)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of information received</th>
<th>N</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results of quality inspections</td>
<td>36</td>
<td>(90)</td>
</tr>
<tr>
<td>Nature and extent of incidents/disasters</td>
<td>31</td>
<td>(78)</td>
</tr>
<tr>
<td>Number and type of treatment</td>
<td>25</td>
<td>(63)</td>
</tr>
<tr>
<td>Nature and extent of complications</td>
<td>22</td>
<td>(55)</td>
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<tr>
<td>Mortality rates</td>
<td>21</td>
<td>(53)</td>
</tr>
<tr>
<td>Quality of the treatments carried out</td>
<td>20</td>
<td>(50)</td>
</tr>
<tr>
<td>Number and results from improvement paths/projects</td>
<td>17</td>
<td>(43)</td>
</tr>
<tr>
<td>Results of patient satisfaction surveys</td>
<td>8</td>
<td>(20)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>The frequency quality appears on the agenda of board meetings</th>
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<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every meeting</td>
<td>10</td>
<td>(25)</td>
</tr>
<tr>
<td>Most meetings</td>
<td>23</td>
<td>(58)</td>
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<tr>
<td>Some meetings</td>
<td>7</td>
<td>(18)</td>
</tr>
<tr>
<td>Few meetings</td>
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<td>(0)</td>
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<tr>
<td>Never on the agenda</td>
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<td>(0)</td>
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</table>

<table>
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<th>Type of information used for policy-making</th>
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<tbody>
<tr>
<td>Results of quality inspections</td>
<td>36</td>
<td>(90)</td>
</tr>
<tr>
<td>Nature and extent of incidents/disasters</td>
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</tr>
<tr>
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<td>(88)</td>
</tr>
<tr>
<td>Number and results from improvement paths/projects</td>
<td>34</td>
<td>(85)</td>
</tr>
<tr>
<td>Quality of the treatments carried out</td>
<td>30</td>
<td>(75)</td>
</tr>
<tr>
<td>Results of patient satisfaction surveys</td>
<td>26</td>
<td>(65)</td>
</tr>
<tr>
<td>Mortality rates</td>
<td>26</td>
<td>(65)</td>
</tr>
<tr>
<td>Nature and extent of complications</td>
<td>24</td>
<td>(60)</td>
</tr>
</tbody>
</table>
1.3.3 Quality orientation and hospital performance

The performance of the hospitals in our sample did not differ significantly from all Dutch hospitals. They were considered to be representative of the performance of all Dutch hospitals. For both respondent groups there were ten hospitals in the top 25% and bottom 25%, hence the top ten and bottom ten hospitals. As can be seen in Figure 1.2, performance on process indicators differed significantly between the top ten and bottom ten hospitals in both groups. The characteristics of these hospitals did not differ significantly from the rest of the hospitals in our sample. However, there seems to be no significant differences between the top ten and bottom ten hospitals on how boards of trustees rated their influence on quality performance, their level of expertise in quality management and how far they are aligned with the executive board on quality issues.

Figure 1.2 Hospital performance on a composite measure of quality-related process indicators in 2010, divided by the top 10 and bottom 10 performing hospitals for both respondent groups: board of trustees (BoT) and executive boards (HB)
We found no significant association between hospital performance and the degree to which the executive board was orientated towards quality. Nor did we find differences in how they perceived their influence on quality performance and their level of expertise in quality management. Further exploration of the 22 hospitals, from which both respondents returned a questionnaire, showed no association between the quality orientation of the boards of trustees and the executive boards (Chi$^2 = 0.53$, p = .47). Neither was there an association with hospital performance.

1.4 Discussion

Our first two objectives were to describe the governance system in Dutch hospitals and to determine the quality orientation of boards of trustees and executive boards. Additionally, we wanted to find a relationship between the quality orientation and hospital performance. There has been a variety of policy guidelines that promoted good governance. We also observed that the quality orientation of trustees and executive boards is growing and is widespread throughout many hospitals. However, we were not able to find a relationship between the quality orientation of trustees and executive boards and their hospital’s performance.

The conceptualisation of hospital performance has its limitations. Firstly, we used process indicators instead of outcome indicators because we assumed that governing bodies primarily have influence on hospital processes, while medical specialists have influence on patient outcomes. Besides, previous studies emphasised that patient level outcome measures, such as mortality rates, are prone to imprecision and bias [28–30]. Secondly, although complementing quantitative data with qualitative interviews provides a more complete image of performance [17], it was beyond the scope of our study to complement our quantitative data with qualitative interviews. Thirdly, a Dutch study showed that performance indicators provide limited insight into the quality of performance due to ambiguity in the indicator definitions [31]. Despite these limitations, these indicators still play, in daily practice, a pivotal role in the transparency paradigm in providing an external accountability. A last methodological limitation was the small sample size. Perhaps the lack of a business case for quality explains the low response rate in our study.

Given the limitations of our study, the results on quality performance should be interpreted with caution. We did, however, find interesting results concerning the
quality orientation of the governing bodies. Regarding the governance model, the request element can be determined as the familiarity with, perceived expertise in, and prioritisation of quality by boards of trustees. However, this seemed to be unrelated to a hospital’s actual performance on quality-related process indicators. In a US-study, high scores on these items occurred significantly more often among boards of trustees in the ten per cent high-performing hospitals than in the ten per cent low-performing hospitals [14]. Concerning the review element, our data showed that many boards of trustees were engaged with quality-oriented activities such as placing quality on the agenda, monitoring quality dashboards, and discussing quality-related subjects with the executive board. However, this did not seem to differ between the top ten and the bottom ten performing hospitals. Jha and Epstein found that, compared to the ten per cent low-performing hospitals, significantly more chairs in the ten per cent high-performing hospitals placed quality on the agenda at every meeting, spending at least 20% of the meeting time on quality [14]. On the level of CEOs similar results were found in other studies [9, 12].

In order to oversee a hospital, information about numerous aspects and processes is required. Weiner and colleagues showed that boards who were engaged in quality issues were also likely to have increased involvement of medical specialists in quality improvement [32, 33]. Concerning the respond element, using quality performance as a topic for the evaluation of the CEO, and the perceived influence on quality, were not in our study found to be associated with hospital performance. By contrast, both items were significantly more apparent in the ten per cent high-performing hospitals than in the ten per cent low-performing ones [14]. Joshi and Hines [11] showed that the orientation of the board towards quality was associated marginally with hospital performance on outcome measures.

Many respondents indicated that their board is comparable to other board within their hospital as far as taking responsibility for quality. This is in line with one of Taylor’s “Nine principles of good governance”, which states that a good relationship between these governing bodies is a prerequisite for good governance [2]. A good relationship between these boards might also depend on the role and official tasks of the trustees [34–36]. Interestingly, these tasks vary between countries. For example, in Canada they are also responsible for developing the hospital’s aims and mission statements [37]. In the UK, their main tasks are to monitor performance of the executive board and to set strategic direction [38]. In France, the equivalent of the board of trustees has no power other than to provide suggestions to the executive board [39]. Previous research also showed that CEO
participation in this board is associated with hospital performance [40]. Additionally, having medical specialists in the executive boards was found to be associated with good hospital performance in the UK [41].

In the Netherlands, the health care reform of 2006 was supposed to create a greater focus on the quality of performance by means of market competition. Although consumer preferences are just beginning to influence insurers’ policy [42], previous studies found that the focus of hospitals still seems to be on financial issues rather than on quality [24]. In other European countries, health care systems are being reformed to meet their citizens’ health care needs and to assure quality of health care [43]. For example, the Health Transformation Programme in Turkey in 2003 introduced a performance-based payment system that led to increased service efficiency and patient satisfaction [44]. In Norway, the Hospitals Enterprise Act led to a governance structure that comprised of one board having conflicting roles, namely, both that of an agent, the management, and the principal role, the owners, who were the Ministry of Health [45]. In order to prevent a principal–agent problem, it is important to know to what extent both boards are informed about, and oriented towards quality of care. Our study showed that there still can be a discrepancy between having a national policy for quality governance on the one hand, and the quality orientation of trustees and executive boards on the other.

Our results indicate that boards do not seem to affect the quality of care. That is remarkable since boards are held responsible for the quality performance of their hospital. One explanation could be that it takes more time to see the effect of hospital governance on quality performance. Elements of quality governance were associated with quality performance in US hospitals, probably because they have a longer history of quality governance than in the Netherlands. Another explanation could be that the relationship between the quality orientation of boards and quality performance is non-linear. We assume that boards influence the hospital quality management systems that enable medical specialists to optimise their care delivery, which in turn leads to better quality of care. This mechanism, however, is not yet well understood. Various studies have already found either a positive relationship between engaged leadership and the development of quality management systems, or a positive relationship between quality management systems and hospital performance [46, 47]. Therefore, future research should focus on better understanding of how boards can improve quality performance. Research should investigate in a more qualitative manner the relationship between how boards are orientated towards quality and the quality of their hospitals’ performance. Another
focus could be to investigate how boards influence more structural elements of quality management and the involvement of medical specialists in governance.

1.5 Conclusions

We found that trustees and executive boards are reasonably orientated towards quality. Receiving and reviewing information about quality performance should provide insights and opportunities to improve quality. However, we were not able to find a linear relationship between quality orientation and hospital performance. Therefore, we assume that boards have a non-linear influence on quality performance, meaning that they might instigate the development of quality management systems, which in turn could enable medical specialists to optimise their care delivery, leading to better quality of care. Future research should focus on the underlying mechanisms of improving the quality of care. After all, executive boards are responsible for the quality of care, so it is essential for them to know how they can achieve it.

Acknowledgments

The authors would like to thank all respondents for their efforts. We are also thankful to dr. Martin P. Bakker for his efforts during the data collection period and Peter Spreeuwenberg for his appreciated support during data analysis.
References


Chapter 1


Clinical governance in the Netherlands

Published as:
Abstract

Purpose
For accountability purposes, performance information sharing and clear divisions of responsibilities between medical specialists and executive boards are critical. The purpose of this paper is to explore whether these aspects of clinical governance have been taken up by executive boards and medical specialists in the Netherlands.

Design/methodology/approach
This cross-sectional study aimed to explore the information-sharing between medical specialists and executive boards in Dutch hospitals as one key aspect of clinical governance. Between November 2010 and February 2011, 67 medical staff board chairs and 40 chief executive officers completed an online questionnaire concerning information-sharing and the clinical governance practices within their respective hospitals.

Findings
Almost all respondents acknowledged the importance of information-sharing. However, the actual sharing differed per type of performance information. Policy/management information was shared more often than patient care information. Similarly, medical specialists differ in the degree of responsibility they take for specific clinical governance tasks. Almost all were involved in managing complication registries (99 per cent), while few managed hospital accreditation (55 per cent).

Research limitations/implications
With executive boards and medical specialists being increasingly dependent of a shared budget, they have an extra incentive to share information and to take up clinical governance tasks. The study showed that Dutch medical specialists are sharing many types of performance information with the executive board, but that this should be increased to comply with the codes. Thus far, few hospital managers in the study have formalised this in an information protocol, which is potentially the next step for other hospital staff to incorporate as well. Those who have an information protocol seem to be aware of the business case for quality.
2.1 Introduction

Executive boards are increasingly being held accountable for their hospital service quality. This is best illustrated by European research committee reports investigating quality and safety scandals in hospital care. For example, Staffordshire Hospital’s Foundation Trust managers in the UK were severely criticised for its high mortality rates. The health care committee’s conclusions were devastating as they pinpointed appalling management-inadequacies, namely the notion that monitoring quality performance was someone else’s responsibility [1]. Similarly, a research committee investigating the avoidable Klebsiella bacteria outbreak in the Dutch Maasstad Hospital intensive care unit concluded that the internal quality management system did not succeed in providing structural feedback about care delivery [2]. The executive board’s accountability for hospital performance is laid down in clinical governance, defined as “a system through which health care organisations are responsible for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in clinical care will flourish” [3]. In practice, this means dividing responsibilities, establishing procedures, sharing performance information about procedural effects and managing the organisation accordingly.

Being informed about quality performance is one clinical-governance key aspect. Executive boards need to receive regularly updated information about performance to take their responsibility, to discuss quality and safety issues in the board room and to take decisions on quality improvement policies [4]. It seems that hospital staff performs better on quality indicators when executive boards use these indicators for operations management and performance improvement [5]. Additionally, quality improvement projects were more successful in hospitals where the executive board was more involved in quality [6, 7]. There is also evidence showing that hospital performance is associated with medical specialists taking up managerial tasks and their co-operation with the executive board [6, 8].
Arguably, medical specialists and executive boards, who better divide responsibilities and share information, can make a difference. Specialists in several countries have developed and implemented clinical governance conduct codes, which generally aim to specify the goals for health care providers and to describe how they are supposed to assure high-quality services [9]. Especially in the Netherlands, where the hospital system is decentralised and market-based reforms were implemented, there is less command and control from the government. Therefore, the major agreements are provided by sector staff themselves. Subsequently, the joint Health Care Sector Organisations (Brancheorganisaties Zorg), which is an umbrella organisation for health care associations, established the Care-wide Governance code for good management and supervision [10]. The Dutch Order of Medical Specialists, which is the largest association for medical specialists in the Netherlands, provided a code of conduct to improve quality [11]. These two codes follow the same philosophy as other codes in the European Union. This philosophy is to comply or explain and requires staff to explain why they departed from a given code of conduct [12]. However, it is unclear how medical specialists and executive boards meet their responsibilities and share information about patient care. Therefore, we aimed to describe the clinical governance structure in the Netherlands and to explore how far codes of conduct are practiced. We developed the following questions:

(1) What is the hospital clinical governance structure in the Netherlands?
(2) To what degree are medical specialists and executive boards familiar with the codes developed by the Order of Medical Specialists and the joint Health Care Sector Organisations?
(3) Is the degree to which medical specialists and executive boards share information and divide clinical governance tasks in compliance with the codes of conduct?
2.2 Method

We carried out a cross-sectional explorative questionnaire-based survey in winter, 2010/2011 to answer our research questions.

2.2.1 Sample

Medical staff board and executive board chairs in all 97 Dutch hospitals were invited by email to complete an online questionnaire. We sent reminders after three and five weeks.

2.2.2 Clinical governance structure

To answer the first research question, we reviewed key literature and codes of conduct to give a Dutch hospitals clinical governance structure overview.

2.2.3 Questionnaire content

To answer the second research question, we constructed a questionnaire in which respondents could indicate their familiarity with the codes of conduct. Additionally, we incorporated questions about the respondents’ quality engagement. These questions originate from a questionnaire about governance and care quality [13], which we translated and applied to the Dutch context. In this way, yes-or-no questions were asked about quality aspects such as how often quality performance was discussed during the meetings and the harmony achieved between medical specialists and the executive board regarding their responsibility for care quality. The third research question concerned applying the codes of conduct in practice and what this meant in relation to clinical governance uptake and information-sharing. Information can roughly be divided into policy or management and patient care information. In the Netherlands, medical specialists ought to inform the executive board about information from both organisational and clinical nature. Information can be the results of quality visitations (standards-based on-site surveys conducted by medical peers to evaluate care delivery and how professionals work), judicial procedures (lawsuits about care provision), copies of re-registration by medical specialists (medical specialists maintain their knowledge and skills for being re-registered in the national registry for medical specialists every five years) and
cases of incidents or calamities. Medical specialists are also expected to share information with the executive board about, for example, mortality rates, training visitations, bottlenecks in facilities, following guidelines and patient satisfaction surveys. Respondents could indicate (using questions requiring a yes-or-no answer in the questionnaire) the information’s importance and whether it is passed to the executive board. The executive boards could, in turn, indicate if they used this information for policy setting. Medical managers could also indicate if medical specialists were involved in clinical governance tasks such as the developing protocols and policy [14].

2.2.4 Data collection

We invited the respondents to answer a specially developed questionnaire on a website in November 2010. A reminder was sent after two and four weeks. The response from the executive board after this period was low. Therefore, they were approached by telephone and asked to participate.

2.2.5 Data analysis

We calculated questionnaire answer frequencies, percentages and averages. The analyses were carried out with Stata/SE 11.0 for Windows.

2.3 Results

2.3.1 Clinical governance in Dutch hospitals

In the Netherlands’ decentralised health system, hospitals are private not-for-profit organisations. Executive boards typically include a chief executive officer (CEO), chief medical officer (CMO) and chief financial officer (CFO). There has been a continuous search for a proper governance model for hospitals that deals with the duality between the medical and lay management realities. In the Netherlands, medical specialists only practice medicine within hospitals since the 1950s, either salaried by the hospital or as an entrepreneur. In the 1980s, government officers set a new financial framework by limiting medical specialists’ income while giving a fixed budget to hospital managers. These changes led to financial tensions between
hospitals (a fixed budget) and medical specialists (paid per treatment), and subsequently to a rearranged prioritisation, efficiency and care quality. This new force field required medical specialists to reshape and redefine the tasks and responsibilities for both care quality and the organisation as a whole. Medical specialists were supposed to play a pivotal role by getting involved in management tasks on a clinical- (organising care) and organisational-level (hospital as a whole). The mid 1990s led to medical specialists and executive boards taking up joint responsibility for setting up and launching a strategic direction for the hospital; the so-called Integrated Medical Specialist Organisation model [15, 16]. Medical specialists were expected to participate in managerial tasks and to take more responsibility for organisational development, which meant that medical work no longer contained medical activities alone, but consisted of inter-disciplinary managerial activities.

2.3.2 Codes of conduct about sharing information and clinical governance tasks

With the Integration Act’s introduction, the dualistic paradigm between medical specialists and the hospital was integrated into one organisation, the hospital, where the final responsibility for care quality was assigned to the executive board. Codes of conduct were introduced to clarify the manner in which medical specialists and the executive board take responsibility for quality. In 2009, the Council for Public Health and Health Care (RvZ) and the Dutch Health Care Inspectorate (IGZ) proposed: executive board has final responsibility for the care quality and patient safety; medical specialists are responsible for their professional treatment; and executive board cannot be held responsible if the medical specialists themselves do not take responsibility for their treatment [17, 18]. In 2010, the joint Health Care Sector Organisations established the Care-wide Governance Code that explained how responsibilities should be divided and that information should be shared so that executive boards could manage the hospital. The Dutch Order of Medical Specialists and the Quality Framework provided a code about dividing responsibilities and information sharing between medical specialists and the executive board. Medical specialists have to share information and subsequently executive boards have to use it for policy making [19].
Box 2.1 The most important points from the framework for quality by the Dutch Order of Medical Specialists and the care-wide governance code by the joint Health Care Sector Organisations

The Framework for Quality (2010)
- Medical specialists deliver good care (safe, effective, efficient and patient-orientated);
- The medical specialist has primary responsibility for the specialist medical care delivered by him or her;
- The medical specialist periodically and systematically shifts, on to the executive board, responsibility for the quality of the care delivered by him or her;
- The medical specialist and the executive board work together on the guarantees of quality and improving specialist medical care.

The Care-Wide Governance Code (2010)
- The executive board has final responsibility for, and is charged with managing, the health care organisation;
- The executive board is responsible for the management of risks associated with the activities of the care organisation;
- The care organisation ensures that all the independently established specialists, including medical specialists, fulfil their responsibility for the manner and results of their business and treatment;
- The executive board provides the supervisory board promptly with all the information necessary for a good execution of the task of supervisor.

2.3.3 Medical specialists’ and executive boards’ familiarity with the codes of conduct

Out of 97 hospitals, 67 MSB chairmen (69%) and 40 CEOs (41%) completed a questionnaire. Respondents were employed in 78 different hospitals, which represent the Dutch hospital sector regarding to size, type and location. In 29 hospitals, both the MSB chairman and CEO responded. In all 45 MSB chairmen (67%) and 35 CEOs (88%) indicated that they were familiar with the Framework for Quality and the Governance Code. Following up on the focus in the codes of conduct, 16 MSBs and seven executive boards discussed quality performance during meetings, whilst 13 MSBs and ten executive boards have quality on the agenda at every meeting. In all 14 MSBs and 12 CEOs indicated that the executive board has the most influence on quality, whilst 30 MSBs and 16 CEOs believed that medical
specialists have the greatest influence. On average, MSBs and CEOs marked themselves approximately eight out of ten for their quality management expertise.

2.3.4 Information sharing and clinical governance tasks in practice

Table 2.1 shows the information that was shared with executive boards by medical specialists varies strongly between hospitals. The MSB chairmen believed that sharing policy or patient care information with the executive board was important. Regarding policy-related information, 62 MSBs (93%) indicated that medical specialists informed the executive board about facility bottlenecks. Medical specialists are obliged to inform the executive board when their registration is renewed, which was done according to 31 MSBs (46%). Information about patient care that was shared most is incidents (81%), number and treatments (67%). Information about complications was shared least (39%). Information about patient care seems to be shared less often with the executive board than policy-related information, by 73 and 58% MSBs, respectively. The information that is used by executive boards for policy making is both policy related and about patient care, as indicated by 72 and 75% of the CEOs, respectively. Managers in 18 hospitals have an official protocol that stipulates which information is reported to the executive board by medical specialists. Additionally, on a scale of one to ten, it was indicated that both MSB and executive boards broadly averaged a seven for ensuring agreement between medical specialists and their executive board about the care quality, suggesting that there was agreement. Table 2.2 shows that many clinical governance tasks are taken up by medical specialist. In all, 66 MSBs (99%) indicated that medical specialists are involved in managing the complications register, whilst in 37 hospitals (55%) medical specialists are involved in Dutch Institute for Accreditation in Healthcare (NIAZ) requirements.
Table 2.1: Overview of the number of MSBs who indicated that medical specialists in their hospital provide information on accountability to the executive board, as well as the number of executive boards who indicated to use this information for policy.

<table>
<thead>
<tr>
<th>Type of information on accountability from the Framework for Quality</th>
<th>Number of MSBs who indicated that medical specialists provide information to the executive board</th>
<th>Number of executive boards who indicated that information given was used for policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information about policy / management (mean, %)</td>
<td>49.1 (%73%)</td>
<td>28.8 (%72%)</td>
</tr>
<tr>
<td>Bottlenecks in the facilities made available for medical staff</td>
<td>62 (93%)</td>
<td>34 (85%)</td>
</tr>
<tr>
<td>Results of quality visitaties</td>
<td>59 (88%)</td>
<td>36 (90%)</td>
</tr>
<tr>
<td>Medical policy plan (of the medical staff)</td>
<td>59 (88%)</td>
<td>34 (85%)</td>
</tr>
<tr>
<td>Quality annual report medical staff</td>
<td>49 (73%)</td>
<td>22 (55%)</td>
</tr>
<tr>
<td>Results of training visitaties</td>
<td>48 (72%)</td>
<td>26 (65%)</td>
</tr>
<tr>
<td>Judicial procedures care provision</td>
<td>47 (70%)</td>
<td>26 (65%)</td>
</tr>
<tr>
<td>Number and results from improvement paths/projects</td>
<td>46 (69%)</td>
<td>34 (85%)</td>
</tr>
<tr>
<td>Bottlenecks with applying protocols and guidelines</td>
<td>41 (61%)</td>
<td>28 (70%)</td>
</tr>
<tr>
<td>Copy of re-registration of medical specialists</td>
<td>31 (46%)</td>
<td>19 (48%)</td>
</tr>
<tr>
<td>Information about patient care (mean, %)</td>
<td>38.6 (%58%)</td>
<td>29.9 (%75%)</td>
</tr>
<tr>
<td>Nature and extent of incidents/calamities</td>
<td>54 (81%)</td>
<td>35 (88%)</td>
</tr>
<tr>
<td>Number and type of treatment</td>
<td>45 (67%)</td>
<td>35 (88%)</td>
</tr>
<tr>
<td>Mortality figures</td>
<td>42 (63%)</td>
<td>26 (65%)</td>
</tr>
<tr>
<td>Quality of the treatments carried out</td>
<td>38 (57%)</td>
<td>30 (75%)</td>
</tr>
<tr>
<td>Results CQ-indexes patient satisfaction</td>
<td>37 (55%)</td>
<td>26 (65%)</td>
</tr>
<tr>
<td>Results research on co-worker satisfaction</td>
<td>28 (42%)</td>
<td>33 (83%)</td>
</tr>
<tr>
<td>Nature and extent of complications</td>
<td>26 (39%)</td>
<td>24 (60%)</td>
</tr>
</tbody>
</table>

N = 40 CEOs; N = 67 MSB chairs. Items based on the Framework for Quality (OMS, 2010)
2.4 Discussion

Our aim was to understand clinical governance by investigating to what extent medical specialist share information with the executive board and their involvement in clinical governance tasks. We were able to map how clinical governance has taken shape in the Netherlands, to what extent medical specialists and executive boards share information and how the responsibilities for care quality are divided between them.

Table 2.2 Overview of the number of MSBs who have indicated that medical specialists are involved in clinical governance tasks (N=67)

<table>
<thead>
<tr>
<th>Clinical governance tasks of medical specialists</th>
<th>Number of MSBs who indicate that medical specialists are actively involved in clinical governance tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complications register</td>
<td>66 (99%)</td>
</tr>
<tr>
<td>Patient safety</td>
<td>65 (97%)</td>
</tr>
<tr>
<td>Quality visitaties of the partnership/ professional group</td>
<td>65 (97%)</td>
</tr>
<tr>
<td>The developing and implementing of protocols</td>
<td>64 (96%)</td>
</tr>
<tr>
<td>The developing and implementing of the EPD</td>
<td>63 (94%)</td>
</tr>
<tr>
<td>Safely reporting incidents (VIM)</td>
<td>62 (93%)</td>
</tr>
<tr>
<td>The treatment of complaints</td>
<td>62 (93%)</td>
</tr>
<tr>
<td>Coordinating of specialist medical care</td>
<td>60 (90%)</td>
</tr>
<tr>
<td>Patients Information</td>
<td>60 (90%)</td>
</tr>
<tr>
<td>Setting up and implementing improvement projects</td>
<td>60 (90%)</td>
</tr>
<tr>
<td>Management participation</td>
<td>58 (87%)</td>
</tr>
<tr>
<td>Policy and organisational development</td>
<td>57 (85%)</td>
</tr>
<tr>
<td>Mutual testing</td>
<td>56 (84%)</td>
</tr>
<tr>
<td>Scientific research</td>
<td>53 (79%)</td>
</tr>
</tbody>
</table>

- Table 2.2 continues -
Clinical governance tasks of medical specialists

<table>
<thead>
<tr>
<th>Clinical governance tasks of medical specialists</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provision of information on quality and care</td>
<td>51 (76%)</td>
</tr>
<tr>
<td>Managing the relationship with insurers</td>
<td>50 (75%)</td>
</tr>
<tr>
<td>Patients guidance</td>
<td>47 (70%)</td>
</tr>
<tr>
<td>Activities and requirements of NIAZ accreditation</td>
<td>37 (55%)</td>
</tr>
</tbody>
</table>

### 2.4.1 Sharing and using quality information

After a long history of shaping medical practice in the Netherlands, the practice has evolved into quasi-dualistic health care organisations in which medical specialists are held accountable by the executive board. Together they have a joint responsibility for setting up and launching a hospital’s strategic direction, but eventually executive boards are held accountable for their hospital care. For executive boards to fulfil this role, they require reliable information about care processes and outcomes. Information that is incorporated in the codes to share with the executive board was considered to be important by most respondents.

Our data show that hospitals varied in the way conduct codes were opted. It seemed that mostly policy-related information was shared rather than patient care information. It appeared types of information were shared to a lesser degree when the information was considered to be not important. Apparently, both the joint Health Care Sector Organisations and the Dutch Order of Medical Specialists do not enjoy grassroots support by those who they represent. In the Netherlands, there is no centralised health care system to set the rules, compared to the UK NHS, requiring stakeholders to develop codes of conduct themselves. Additionally, the Dutch Medical Association (KNMG), which is an overarching organisation that represents all medical specialists and medical students, indicated that it was important to share information with the executive board, especially quality inspections, judicial procedures and medical complications [20]. However, in our
study, approximately 60 per cent of MSBs indicated that complications were not important enough to share with the executive board.

Parallel to the codes, hospital and medical specialist financing is increasingly becoming intertwined, which requires them to work together in dividing responsibilities and sharing information. However, previous studies showed that medical specialists and executive boards differ in their autonomy and responsibilities [21-24]; e.g. how mutual understanding and empathy is imputed [25]. Therefore, clear agreements should be made. In our study, there were some executive boards that specified who was responsible for delivering an information protocol. Launching an official information protocol indicates that how this responsibility is shared has been firmly established.

2.4.2 Medical specialists taking up clinical governance tasks

In addition to establishing responsibilities in an information protocol, medical specialists and the executive board, together, are responsible for setting up and carrying out policy. In our study, it appears in many hospitals, medical specialists are involved in clinical governance tasks that are related to either patient care or policy issues. An important link can be achieved by involving medical specialists in the responsibility for clinical governance and, in doing so, make the organisation more attuned to quality. Medical specialist involvement in clinical governance could stimulate the collaboration with other specialties, which in turn could lead to improved patient safety culture [26] since medical specialists in managerial positions can stimulate teamwork within and across units [27]. Studies in the USA show an association between hospital quality and management tasks by medical specialists and their co-operation with their executive board [6, 8]. This finding was confirmed by Koelewijn and colleagues: “management can improve hospital performance by actively seeking the involvement of medical specialists in entrepreneurial processes” [28]. In our study, we found that both believed that the mutual agreement on care quality was reasonably good.

2.4.3 Limitations

A 41% response rate in the Dutch and in the international literature is a common percentage [29]. Although the hospitals from our sample can be considered to be a fair representation, total hospitals in the Netherlands in which it is possible to carry
out a deeper analysis is limited. The findings should therefore be interpreted cautiously. We could establish with reasonable certainty that many hospitals do not follow all the recommendations from the Framework for Quality and the Governance Code in practice. Our questionnaire data contained self-reported information, which means that we do not know if respondents gave socially desirable answers. Therefore we have, as far as possible, asked about facts. We asked the MSB chairmen on the medical specialists’ behalf to indicate where responsibility lay. A more complete picture could have been possible if all the medical specialists indicated what was applicable to them, but we expected that the MSB would give a true picture; e.g. regarding the information that the medical specialists gave to the executive board.

2.5 Conclusion

Clinical governance in the Netherlands has been formalised by conduct codes that focus on information-sharing and clinical governance tasks. Our study showed that medical specialists are sharing information with the executive board, but that this should be increased to comply with the codes. With executive boards and medical specialists increasingly reliant on shared budgets, they have an extra incentive to share information and divide clinical governance tasks. Few hospital managers in our study formalised this in information protocols, which is potentially the next step for other hospital managers to incorporate. Those who have an information protocol seem to have a business case and quality awareness.
Clinical governance in the Netherlands

Chapter 2

Chapter 2: Clinical Governance in the Netherlands

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A review of quality management systems

Published as:
A review of quality management system assessments

Published as:
Abstract

Purpose
Health care providers invest substantial resources to establish and implement hospital quality management systems. Nevertheless, few tools are available to assess implementation efforts and their effect on quality and safety outcomes. This review aims to (i) identify instruments to assess the implementation of hospital quality management systems, (ii) describe their measurement properties and (iii) assess the effects of quality management on quality improvement and quality of care outcomes.

Data sources
We performed a systematic literature search from 1990 to 2011 in PubMed, CINAHL, EMBASE, Cochrane Library and Web of Science. In addition, we used snowball strategies, screened the reference lists of eligible papers, reviewed grey literature and contacted experts in the field.

Study selection and data extraction
Two reviewers screened eligible papers based on pre-defined inclusion and exclusion criteria and all authors extracted data. Eligible papers are described in terms of general characteristics (settings, type and level of respondents, mode of data collection), methodological properties (sampling strategy, item derivation, conceptualization of quality management, assessment of reliability and validity, scoring) and application/implementation (accounting for context, organizational adaptations, sensitivity to change, deployment and effect size).

Results
Eighteen papers were deemed eligible for inclusion. While some common domains emerged in measurement conceptualization, substantial differences in scope persist. The instruments’ measurement properties were insufficiently described and only few instruments assessed links between the implementation of quality management systems (QMS) and improvement strategies or outcomes.
Conclusions
There is currently no well-established measure to assess the implementation and effectiveness of quality management systems. Future research should address this gap.

3.1 Introduction

Considerable progress has been made in assessing the quality of care and implementing a wide range of quality improvement strategies such as accreditation systems, organizational quality management programmes, clinical audit, patient safety systems, clinical practice guidelines, quality improvement collaboratives, performance indicators and systems for getting patient views [1, 2]. Nevertheless, quality and safety problems persist and the debate on how to accelerate and sustain quality improvement is more relevant than ever [3–6]. In response to persisting quality and patient safety concerns, the pressure on hospitals to report their approach to ensure quality is increasing [7, 8].

Quality management systems (QMS) are a prerequisite for the homogeneous and systematic application of quality improvement activities throughout smaller organizational units [9]. While comprehensive assessment frameworks and external quality standards are widely employed, concise instruments (defined as psychometrically validated surveys, self-assessment manuals or other measurement tools) that map the stage of quality management system implementation are less easily recognized. Examples of such instruments are the European Research Network on Quality Management in Health Care questionnaire for the evaluation of quality and safety management in hospitals [9], the organizational quality surveys conducted by Shortell et al. [10] or the Methods of Response to Quality Improvement Strategies (MARQuIS) classification model for quality improvement systems [11]. Wider applications of such instruments, if they are valid and reliable, could inform managers about deficits in their quality management systems and demonstrate to stakeholders the hospital’s efforts to improve quality and safety [12, 13]. They could also ensure that quality improvement actions are properly conducted, appropriate to context and have an impact on clinical practice and quality of care outcomes [14].

Yet, considerable uncertainty exists with respect to how health care organizations implement quality improvement strategies, how comprehensive and
effective their approach is and to what extent this impacts on patient level outcomes [15, 16]. Therefore, we conducted a systematic review of the literature to (i) identify instruments measuring quality management systems, (ii) describe their psychometric properties and (iii) assess the effects of quality improvement activities, as measured by the instruments, on quality improvement and quality of care outcomes.

### 3.2 Methods

#### 3.2.1 Definitions

Quality management systems are defined as a set of interacting activities, methods and procedures used to direct, control and improve quality of care [9]. Quality improvement is aimed at increasing effectiveness and efficiency of distal (management oriented) and proximal (patient-oriented) care processes in order to reach better outcomes for patients [17]. Quality of care outcomes are defined to cover measures of clinical effectiveness, patient safety and patient-centeredness [18].

#### 3.2.2 Search strategy

**Databases**

A systematic literature search from 1990 to 2011 was performed in May 2011. The first step of the search was limited to titles only, no language limitations were applied. The following five electronic databases were searched: PubMed, CINAHL, EMBASE, Cochrane Library and Web of Science. We used snowball strategies, screened the reference list of eligible papers and contacted experts (see the section Acknowledgements) in the field to identify additional instruments, including unpublished and grey literature.

**Search terms**

We developed a Boolean search strategy for PubMed incorporating truncated search terms and potential synonyms (Table 3.1). This search strategy was fine tuned for the other four databases. In addition, for PubMed we applied a more
sensitive filter that was developed by Terwee to better capture measurement instruments [19].

**Table 3.1** Generic search terms with Boolean connectors (with truncation)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Measurement instrument</th>
<th>Population</th>
<th>Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quality management systems</strong></td>
<td>Hospital* OR</td>
<td>Department</td>
<td><strong>Instrument</strong>* OR</td>
</tr>
<tr>
<td>Clinical governance</td>
<td>Care</td>
<td></td>
<td>Tool</td>
</tr>
<tr>
<td>Quality assurance</td>
<td>Ward</td>
<td></td>
<td>Assess*</td>
</tr>
<tr>
<td>Quality system</td>
<td>Provider</td>
<td></td>
<td>Evaluat*</td>
</tr>
<tr>
<td>Improvement strateg*</td>
<td></td>
<td></td>
<td>Measur*</td>
</tr>
<tr>
<td>Quality improvement</td>
<td></td>
<td></td>
<td>Classif*</td>
</tr>
<tr>
<td>Structure</td>
<td></td>
<td></td>
<td>Questionnaire*</td>
</tr>
<tr>
<td>Design</td>
<td></td>
<td></td>
<td>Survey</td>
</tr>
<tr>
<td>perform*</td>
<td></td>
<td></td>
<td>Indicat*</td>
</tr>
</tbody>
</table>

In PUBMED the symbol "*" denotes the preceding word combined with any letters to follow, e.g. "Method*" reflects "Method", "Methodology", "Methodologies", etc. Limits: date from 1990; field: title.

**3.2.3 Study selection**

Inclusion criteria
Studies were selected if they complied with each of the following criteria: focusing on quality management systems or quality improvement implementation; addressing the development or application of a measurement instrument and referring to the hospital setting. Only original research papers were included.
Exclusion criteria
We excluded papers that addressed generic improvement models not targeted at the health care sector (such as lean or six sigma models), focused solely on hospital quality outcomes rather than quality systems and strategies, exclusively addressed individual quality and safety strategies (such as strategies to improve hand hygiene in hospitals), and that addressed generic and large-scale quality assessments (such as ISO, EFQM or accreditation systems) without assessing their implementation using dedicated evaluation tools. Moreover, we excluded search returns that dealt with specific services such as psychiatric care, transplantation services or hospital laboratories.

3.2.4 Screening process

Two reviewers (O.G. and D.B.) performed each step of the screening process independently; a third reviewer (C.W.) handled disagreements. The screening process entailed five steps. First, the results from the databases were checked for duplicates. Using Reference Manager© these duplicates were deleted. In the second and third steps, the titles and abstracts were screened. These two steps were performed using the support of a custom-made web-based screening tool to make the screening process more efficient. Full texts were collected from the studies that were selected after the abstract screening. The fourth step comprised full-text selection. Before continuing to data extraction, for the fifth step of the screening process, additional studies that were recommended by experts and were not found during the search strategy, as well as relevant studies that were identified in the reference lists of included studies, were collected and screened according to step four.

3.2.5 Data extraction

We developed a standardized Excel sheet for data extraction from the included studies. The development of this sheet was informed by criteria for the assessment of measurement instruments and by quality improvement theory. For the former, we based our data extraction sheet following recommendations for the reporting of measurement properties of questionnaire-based outcome measures [20]. First, basic characteristics of the included studies were collected (author and year, country, setting, definition focus, respondents, survey administration, sampling
frame and response rates). Secondly, detailed information on the development of the measurement instruments and their psychometric properties was obtained. These properties concerned item generation and response scales, testing for psychometric properties (reliability, validity and scoring), and the domains of the instrument. To identify common measurement domains, we conducted a simple thematic content analysis [21] and identified themes that recur in various instruments. We extracted data essential from the viewpoint of quality improvement theory, such as the sensitivity to context of the measure (legal, regulatory, organization type). Last, if available we collected information on the effect size on (1) systematic deployment of quality improvement strategies throughout the organization, (2) efforts to sustain quality improvement actions and (3) patient level outcome measures. A full list of the data extraction criteria is presented in Appendix 3.1.

All data were extracted by alternating pairs of authors (C.W., D.B., M.A.L., O.G. and R.S.). Each pair covered 30–40% of the selected studies, whereas one author (O.G.) covered 100% in order to attain an overview of all the included studies. Subsequently, results were compared within each pair, and in case of any discrepancy reconciliation was made through discussion or by a third author (O.G.). The data extraction sheet was piloted and refined after piloting. Results of the review are reported according to the PRISMA statement [22].

3.2.6 Assessment of methodological quality

We assessed the methodological quality of the included studies using the appraising tool from Hawker et al. [23] (Appendix 3.2), as it is appropriate for mixed methods research (e.g. qualitative methods to develop a questionnaire and quantitative methods to determine its reliability and validity). We used eight items instead of nine items in the original tool because the item on ethical approval did not apply to our studies. Of each item (A–H) we could determine its quality (1 = good; 2 = fair; 3 = poor; 4 = very poor). The overall methodological quality was determined based on the average score over the eight items (1.00–1.49 = good; 1.50–2.49 = fair; 2.50–3.49 = poor; 3.50–4.00 = very poor).
3.3 Results

After initial assessment, the Terwee filter for the identification of measurement studies developed for PubMed was discarded as it proved too sensitive. Figure 4.1 shows the results of the screening process. Our search using the conventional search terms as described above yielded 5261 references across five databases. After elimination of duplications and screening for eligible and non-conclusive abstracts, this list was reduced to 2673 and 26 references, respectively. After full-text review of these 26 manuscripts, 16 additional papers were identified through a snowball search of reference lists and consultation with experts. Eventually, 18 studies fulfilling all inclusion- and exclusion criteria were included in this review [9, 11, 24–39].

3.3.1 Characteristics of included studies

The included studies are summarized in Table 4.2. Since the first study published in 1992, publication on quality management systems has accelerated in the last 5 years. The majority of studies were conducted in Europe (n = 10), followed by North America (n = 4) and other regions of the world (n= 4) demonstrating that research on quality management systems is a global interest. While most of the research focused on general hospitals in the public sector, some studies focused on university hospitals [29, 39] or addressed other health care organizations in addition to hospitals [9]. Fifteen of the 18 studies included large-scale assessments of quality management systems in a geographically defined region or country [9, 11, 25–27, 28, 31, 34, 35–39]. Two studies were smaller multi-centre [24, 29] or single-centre [30] studies. Five studies applied a random or quasi-random sample [11,27,31,32,35], eight studies reported recruiting the whole population of hospitals [9,25,26,28,34,36–38], one study used a stratified sample [33] and the remaining used purposeful or convenience samples, or did not specifically report on the sampling procedure.

The key focus of the studies was to assess the implementation of quality improvement activities in hospitals, to assess attitudes towards the implementation of such activities among professional staff, to assess empirically the links in the structure–process–outcome chain as has been postulated by Donabedian or to identify predictors of hospital performance associated with the implementation of quality improvement activities. In the majority of studies (n = 13) respondents were
high-level decision-makers such as chief executive officers, quality managers or department heads.

3.3.2 Instrument development, psychometric properties and methodological quality

Quality management systems were mostly operationalized following Donabedian’s approach on the relationship between structures, processes and outcomes. Studies drew broadly on the literature, existing quality models (such as Malcom Baldridge Quality Award, the European Foundation for Quality Management Model, National Accreditation Standards, Leapfrog Group, Institute for Healthcare Improvement Model for Improvement), specific research on quality management models and implementation and quality management theory (Table 3.3) [40, 41]. The number of items in the measures under review ranged from 17 to 179, with a median of 45 items. None of the studies involved service end users in the development of the tools. Data are mostly derived from individuals or groups verifying facts, or sharing perceptions regarding the implementation of quality improvement strategies, while one included objective measurements [36].

Psychometric testing of the measures was more common and detailed in the last 10 years [25, 29, 30, 35, 39]. The most common approach to validity testing was factor analysis of the internal structure of the measures, thus providing information on construct validity. Content validity was ensured widely by involving experts and clinical leaders in the design of the instruments. Formal assessments of reliability were mostly limited to assessments of internal consistency using Cronbach’s alpha. One measure explicitly reported on weighting of individual items by assigning weights to response categories using the Plan-Do-Check-Act (PDCA) cycle [11], otherwise, weighting was not reported. Only four measures reported on the burden of data collection in terms of administration time. This ranged from 30 min [9] to 90 min [36].

The assessment of the 18 included studies showed that 10 studies are of good methodological quality [9, 11, 26–28, 31–34, 37], and 5 are of fair methodological quality [24, 25, 35, 36, 38]. Three studies appeared to be of poor methodological quality [30, 31, 39]; conclusions from these studies should be interpreted with caution.
**Figure 3.1** Results of the screening process

<table>
<thead>
<tr>
<th>DATABASE</th>
<th>COUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBMED (N = 1,859)</td>
<td>5,261</td>
</tr>
<tr>
<td>CINAHL (N = 834)</td>
<td>2,673</td>
</tr>
<tr>
<td>EMBASE (N = 972)</td>
<td>33 abstracts</td>
</tr>
<tr>
<td>Cochrane Library (N = 19)</td>
<td>26 full texts</td>
</tr>
<tr>
<td>Web of Science (N = 1,577)</td>
<td></td>
</tr>
</tbody>
</table>

5,261 titles

Eliminating duplicates

2,673 titles

2,640 did not meet inclusion criteria for titles

33 abstracts

7 did not meet inclusion criteria for abstracts

26 full texts

8 articles were added by Expert opinion and another 8 by checking references

42 full texts articles reviewed

24 did not meet inclusion Criteria for full texts

18 studies included
3.3.3 Domains of quality management in hospitals

After thematic content analysis some key domains emerged that are all in line with quality management and improvement theory (Box 4.1). Four of the studies [35–37, 42] operationalized organizational culture as a dimension of quality management, rather than a prerequisite. There was no common approach to conceptualizing information technology (IT) implementation as either a prerequisite for quality improvement implementation or as an integral component of quality management.

Box 3.1 Domains of quality management in hospitals

<table>
<thead>
<tr>
<th>Domains most frequently assessed by the instruments in descending rank order:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Procedures and process management: 9/18</td>
<td></td>
</tr>
<tr>
<td>2. Human resource management, training and development: 6/18</td>
<td></td>
</tr>
<tr>
<td>3. Leadership commitment: 6/18</td>
<td></td>
</tr>
<tr>
<td>4. Analysis and monitoring: 5/18</td>
<td></td>
</tr>
<tr>
<td>5. Structures and responsibilities: 5/18</td>
<td></td>
</tr>
<tr>
<td>6. Patient involvement: 5/18</td>
<td></td>
</tr>
</tbody>
</table>

3.3.4 Implementation of quality management systems and effect size

Most measures were generic, although some included adaptations for different hospital departments [9, 11].

3.3.5 QMS and quality improvement strategies

An assessment of spread (horizontal implementation of quality management throughout the organization) and deployment (vertical implementation from higher to lower organizational units) was generally not specifically operationalized in the measures, although some instruments may allow inferences on spread by assessing inter-departmental variances on quality improvement implementation. Sensitivity to change was reported explicitly for one measure [9]. However, this information was not reported in the original study but was conducted as research building on the original measure [42]. In the study by Lee et al. [33], technical factors (IT implementation and scientific approach to measurement) were strong predictors of the implementation of quality management systems, followed by cultural factors.
(technical factors R² = 57.35, cultural factors = R² 39.8). Strategic planning accounted for much less variance in the data (strategic model R² = 7.84). Parker et al. [35] reported that better group/developmental culture (teamwork/innovative) and top management commitment in QI-related practices were found in hospitals with high quality improvement implementation when compared with low QI implementation. According to Kunkel et al. [31], implementation requisites (adequate resources, expectations, staff competences and problem-solving capacity) had a significant effect on structure and process measures (structural equation model correlation coefficient 0.51, and 0.33, respectively).

3.3.6 QMS and outcome measures

Only four studies explicitly reported the effect of quality management systems on outcomes. Cohen et al. [27] reported a positive impact of subjective assessments of quality improvement activities on a range of manager-perceived outcomes, including patient care, staff member skills, patient satisfaction, productivity, length of stay, hospital–medical specialist relation and medical specialist–nurse relation. Lombarts et al. [11] reported a modest positive linear association between implementation level of quality management and quality improvement outputs, based on observations of actual practice such as patients wearing ID bracelets. In the study by Kunkel et al. [31], a structural equation modelling approach was used to link quality improvement structures, processes and outcomes. The analysis yielded high coefficients for the relation between the structure and process dimensions (correlation coefficient: 0.72) but only small coefficients for the relation between process and outcomes (correlation coefficient: 0.20). However, outcome measurement was based on subjective assessment of respondents using the same questionnaire that was used to gather information on structures and outcomes, and thus subject to common methods bias. Macinati [34] assessed correlations between quality improvement dimensions and indices of hospital performance, the latter including financial performance, operational performance and outcome measures of performance. The strongest relation between hospital performance and quality management was found for the dimensions ‘data utilization’ and ‘reporting’ (correlation coefficient: 0.323, P < 0.01) and ‘employee participation’ (correlation coefficient: 0.316, P < 0.01). However, these associations were only detected using subjective outcome measures instead of objective outcomes (e.g. mortality rates) or measures of financial performance.
3.4 Discussion

3.4.1 Methodological quality of the instruments

The instruments featured in the 18 studies included in this review differed substantially in terms of methodological rigor. The lack of sampling criteria aiming at representative samples may limit the generalizability of the data reported for the instruments. Differential willingness to participate, high workload and few incentives to collect data may result in low response rates and limited external validity. Most measures rely on self-reported data of few respondents per organization without strong mechanisms to control for the quality of that data. Context or incentives may induce over-reporting when applying these measures into practice.

In some cases appropriate psychometric testing was performed. This is of particular importance where items are aggregated to form scores that are subsequently used in statistical modelling. Methodological quality of the older studies was fair or poor.

3.4.2 Operationalization of quality management systems

In reporting on QMS, some studies simply reported on survey results without aiming at developing composite measures of QMS implementation. Other studies focused on identifying the underlying constructs of quality management systems. Ceiling effects on overall scores were rare. We observed higher degrees of implementation for formal structures and responsibilities regarding infection control, than others, such as involving patients in designing quality improvement interventions or addressing the needs of chronically ill patients). Low performance on QMS measures may reflect insufficient implementation of quality improvement activities, procedures and guidelines. No single factor accounts for the variance associated with the implementation of QMS. Rather, a combination of leadership, monitoring and professional involvement characterizes implementation, influenced further by the quality-orientation of executive boards, professional engagement in quality governance and organizational culture [43–45].
### 3.4.3 Relationship between quality management systems and outcomes

Only a few instruments explicitly linked quality management constructs to outcomes, either perceived, factual or clinical [11, 27, 31, 33]. The result of these studies, in general, is that this link is weak. The methodological complexity of QMS attributing to outcomes is well established. It concerns the attribution of QMS to specific quality improvement activities, which in turn modify clinical activities and eventually alter patient level outcomes [17, 46–49]. Demonstrated variations in hospitals’ uptake of evidence-based quality improvement interventions and persistent quality and safety concerns warrant further investigation of this link.

### 3.4.4 Future research on quality management systems

This review has shown that various instruments exist to assess quality management systems which unify some commonly accepted domains of quality management in hospitals. The majority of the existing instruments, however, have substantial methodological weaknesses making them unsuitable for large-scale comparative research. Moreover, embedded in many instruments is the assumption that enforcing a certain quality management policy and activity will lead to the desired effect, while ignoring the context that shapes the uptake, implementation and effectiveness of the very quality management interventions. Future research should focus on establishing the causal link between distal factors (management strategies) and quality and patient safety outcomes. This seems essential given the large amount of resources dedicated to organizational quality management interventions in health care, the anticipation that these lead to improved outcomes and the realization, essentially, that this link has actually not yet been sufficiently demonstrated.

### 3.4.5 Limitations of this review

This review has a number of limitations. Research on quality management systems is poorly indexed, thus making it difficult to perform a sensitive and specific search. This is further complicated by diverse disciplines being involved in QMS measure development (psychology, sociology, clinical epidemiology, health service research, health policy) that result in different keywords and publication strategies. We searched for the grey literature and retrieved secondary texts referring to an
instrument that was already included in the review [50–53]. Given our broad search strategy, including data retrieval across a wide range of data bases, multiple languages, manual review of the bibliography of retrieved articles and access to the key experts on the topic that provided further input, we are confident that the most relevant research articles were captured. Lastly, our data extraction was more ambitious with respect to psychometric characteristics but unfortunately this was not reported to recommended standards in the literature [20].

3.5 Conclusion

Instruments to assess the implementation of quality management systems share a core set of domains (e.g. process management, the role of human resources and leadership and analysis and monitoring), although details of conceptualization and methodological rigor differed substantially. The absence of well-established instruments to measure quality management systems and the methodological shortcomings of existing instruments call for further research. Such research should also investigate the contextual factors shaping uptake, implementation and effectiveness of quality management.

Acknowledgements
We would like to thank Professor Alan Cohen, Boston University, Professor Niek Klazinga, University of Amsterdam and members of the Deepening our Understanding of Quality Improvement in Europe (DUQuE) Consortium for information on instruments to assess quality management systems.
References


32. Kunkel S, Rosenqvist UF, Westerling R. The structure of quality systems is important to the process and outcome, an empirical study of 386 hospital departments in Sweden. BMC Health Services Research, 2007;7:104.


45. Leatherman ST, Hibbard JH, McGlynn EA. A research agenda to advance quality measurement and improvement. Medical Care, 2003;41(Suppl. 1):I80–86.


Table 3.2: Characteristics of the 18 studies included in the review

<table>
<thead>
<tr>
<th>Author</th>
<th>Country</th>
<th>Setting</th>
<th>Definition focus</th>
<th>Respondent</th>
<th>Administration</th>
<th>Sampling frame and response rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrable (1992)</td>
<td>Canada (Ontario)</td>
<td>Acute, chronic care, psychiatric care and rehabilitation hospitals</td>
<td>To assess the implementation of components of medical quality assurance</td>
<td>Letter sent to CEO to be answered by the person most responsible of medical administration</td>
<td>Mailed survey</td>
<td>All hospitals (245) of the Ontario Hospital Association were approached; 179 (73%) responded.</td>
</tr>
<tr>
<td>Binsaeed (1995)</td>
<td>Saudi Arabia</td>
<td>Acute hospitals</td>
<td>To measure major attributes of effective implementation of quality assurance</td>
<td>Physicians</td>
<td>Not reported</td>
<td>Three hospitals were selected based on a previous engagement in quality assurance. Criteria included: departments managed by a quality assurance specialist, existence of hospital-wide policies and procedures, empirical studies were conducted in hospitals. 270 questionnaires were distributed and 202 (75%) questionnaires were completed.</td>
</tr>
<tr>
<td>Author</td>
<td>Country</td>
<td>Setting</td>
<td>Definition focus</td>
<td>Respondent</td>
<td>Administration</td>
<td>Sampling frame and response rates</td>
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<tr>
<td>Graz</td>
<td>Switzerland</td>
<td>Swiss University hospitals</td>
<td>To identify current activities in university hospitals and the attitudes of department heads towards quality assurance</td>
<td>Clinical Department heads</td>
<td>Mailed survey</td>
<td>Purposeful sample of 5 hospitals. Key informants in each university hospital provided a list of department heads (all clinical services included). 246 questionnaires were sent, 147 were returned (60%). 138 questionnaires were analysed.</td>
</tr>
<tr>
<td>Weber</td>
<td>USA (University</td>
<td>Academic Medical Centres (acute</td>
<td>To assess how Academic Medical Centres have structured their quality departments and programs, and how effective they are in meeting organizational goals</td>
<td>Survey completed by chief nursing officers, quality managers, and physicians responsible for quality functions</td>
<td>Not reported</td>
<td>51 Academic Medical Centres were surveyed; specific sampling criteria not reported.</td>
</tr>
<tr>
<td>Author</td>
<td>Country</td>
<td>Setting</td>
<td>Definition focus</td>
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<td>Administration</td>
<td>Sampling frame and response rates</td>
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<tr>
<td>Parker (1999)</td>
<td>United States</td>
<td>Veterans Health Administration hospitals</td>
<td>To investigate the association between leadership and organizational culture and the hospital's degree of quality improvement implementation</td>
<td>Non-managerial employees, department managers, and hospital directors</td>
<td>Mailed survey</td>
<td>162 Veteran's Health Administration hospitals participated, 116 returned sufficient survey data. Within participating VHA hospitals, non-managerial employees were randomly selected, and all other two respondent types were selected. 1st questionnaire to 14,892 non-managerial employees (67%), 2nd questionnaire to approx. 3400 service chiefs and department managers (RR 71%), 3rd questionnaire to 155 hospital directors (81%).</td>
</tr>
<tr>
<td>Wagner (1999)</td>
<td>Netherlands</td>
<td>Hospitals, primary care health centres, and organizations providing care for mental health, disabled, long term care, and home care</td>
<td>To measure and compare quality systems' development, and the extent of implementation</td>
<td>Quality managers</td>
<td>Mailed survey</td>
<td>Organizations were sampled at national level. Overall, 1594 organizations participated, including 143 hospitals (74%). population survey; random sample for long term care</td>
</tr>
<tr>
<td>Author</td>
<td>Country</td>
<td>Setting</td>
<td>Definition focus</td>
<td>Respondent</td>
<td>Administration</td>
<td>Sampling frame and response rates</td>
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<tr>
<td>Lee (2002)</td>
<td>Korea</td>
<td>large hospitals (&gt; 400 beds)</td>
<td>To identify the extent of continuous quality improvement implementation</td>
<td>Directors of continuous quality improvement department</td>
<td>Mailed survey</td>
<td>Stratified sample of large hospitals. Of 108 hospitals participating (13% of all South Korean hospitals), data from 63 hospitals was used after excluding ineligible and missing responses. 170 staff members contributed data to the research.</td>
</tr>
<tr>
<td>Hennequin-LeMeur (2003)</td>
<td>France</td>
<td>Support services (labs, pharmacy, radiology) in acute hospitals</td>
<td>Two developed an instrument setting out quality requirements for hospital services and to measure a set of criteria regarding procedure control and client satisfaction</td>
<td>Director of the service.</td>
<td>Online survey</td>
<td>The tool was administered to one hospital and includes all support service departments.</td>
</tr>
<tr>
<td>Wagner (2006)</td>
<td>The Netherlands</td>
<td>All hospitals, aimed for the director of the hospital or the quality manager</td>
<td>To measure the extent of the implementation of Quality Management activities</td>
<td>Hospital level= managing directors only, or managing director along with the quality manager</td>
<td>Mailed survey</td>
<td>The questionnaires were sent to all hospitals in each participating country. Overall, 278 hospitals (76%) participated. The Netherlands=101 (68%), Hungary=116 (94%), Finland=59 (71%).</td>
</tr>
</tbody>
</table>

- Table 3.2 continues -
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<tr>
<th>Author</th>
<th>Country</th>
<th>Setting</th>
<th>Definition focus</th>
<th>Respondent</th>
<th>Administration</th>
<th>Sampling frame and response rates</th>
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</thead>
<tbody>
<tr>
<td>Kunkel (2007)</td>
<td>Sweden</td>
<td>Hospital departments</td>
<td>To investigate the relationship between Donabedian's structure-process-outcome paradigm</td>
<td>Head of department, with the option to delegate task to quality coordinator</td>
<td>Not reported</td>
<td>A simple random sample of 600 hospitals out of 1757 was provided. Answers were expected from 518 departments, but responses were received from 386 departments (RR = 64%)</td>
</tr>
<tr>
<td>Sutherasan (2007)</td>
<td>Thailand</td>
<td>Government accredited hospitals</td>
<td>To develop a Total Quality Management Sustainability Scale and to investigate its reliability and validity</td>
<td>Registered nurses</td>
<td>Not reported</td>
<td>Questionnaires were distributed to all 2,565 registered nurses in 13 government-accredited hospitals, and 2,165 completed surveys were returned (84%).</td>
</tr>
<tr>
<td>Cohen (2008)</td>
<td>US</td>
<td>Short term, non-federal general hospitals &gt; 25 beds</td>
<td>To measure the nature and extent of quality improvement activities and their impact on the quality of care</td>
<td>Hospitals chief quality officer or designated quality manager</td>
<td>Either mailed or online survey</td>
<td>Out of eligible 4237 hospitals, a random sample of 2500 hospitals stratified by bed size was approached. Due to low response rate the remaining hospitals were approached in a second step. Overall, 470 (11%) completed the questionnaire.</td>
</tr>
</tbody>
</table>

- Table 3.2 continues -
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<tr>
<th>Author</th>
<th>Country</th>
<th>Setting</th>
<th>Definition focus</th>
<th>Respondent</th>
<th>Administration</th>
<th>Sampling frame and response rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macinati</td>
<td>Italy</td>
<td>Public health care providers (hospitals) in Italian National Health Service</td>
<td>To identify underlying factors of the Quality Management System as predictors of hospital performance</td>
<td>Organizational level = General Manager</td>
<td>Not reported</td>
<td>All Italian public health providers were approached (N = 353), of which 148 returned questionnaires. 144 questionnaires were used in the analysis (41.9%)</td>
</tr>
<tr>
<td>Kunkel</td>
<td>Sweden</td>
<td>Hospital departments</td>
<td>To investigate the relation between structure and process of quality system, and implementation prerequisites</td>
<td>Head of department, with option to delegate task to quality coordinator</td>
<td>Not reported</td>
<td>600 respondents were recruited from a simple random sample of hospital departments. 82 departments excluded and 386 out of 518 returned questionnaires (75%) of 92 hospitals were included.</td>
</tr>
<tr>
<td>Lombarts</td>
<td>Spain, France, Poland, Czech Republic, UK, Ireland, Belgium, Netherlands</td>
<td>General, acute hospitals that deliver care for AMI, appendicitis, and deliveries</td>
<td>To develop a classification model for Quality Improvement in European Hospitals and to develop the effect of hospital wide quality improvement activities on quality activities and outputs</td>
<td>At hospital level: Quality manager At department level= department head</td>
<td>Online survey</td>
<td>Recruitment of hospitals was quasi-random: 483 hospitals access the questionnaire and 389 (80.5%) returned it and provided sufficient information to calculate the score. Main source of data were key informants in hospitals (quality managers and department heads).</td>
</tr>
</tbody>
</table>

- Table 3.2 continues -
<table>
<thead>
<tr>
<th>Author</th>
<th>Country</th>
<th>Setting</th>
<th>Definition focus</th>
<th>Respondent</th>
<th>Administration</th>
<th>Sampling frame and response rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Briner (2010)</td>
<td>Switzerland</td>
<td>Swiss hospitals</td>
<td>To develop an instrument that allows for continuous monitoring of the current state and planned developments of clinical risk management in hospitals</td>
<td>Completed by person responsible for clinical risk management in the hospital</td>
<td>Either mailed or online survey</td>
<td>324 Swiss hospital were contacted, and 138 completed the survey (43%).</td>
</tr>
<tr>
<td>Specchia (2010)</td>
<td>Italy</td>
<td>Acute care hospitals</td>
<td>To develop a method to assess the implementation level of clinical governance prerequisites.</td>
<td>Survey administered to managing director. Administration director, or managers, as well as to health care professionals</td>
<td>Structured interviews (using paper or digital forms), documentation review and audit</td>
<td>Specific sampling criteria not reported but the authors report on data from 50 hospitals based on 90 min interview with various key informants plus document analysis following a 5 week process form preparation, survey, analysis, report and workshop</td>
</tr>
<tr>
<td>Gauld (2011)</td>
<td>New Zealand</td>
<td>Public hospitals</td>
<td>To compare hospital performance and provide an indication of commitment to clinical governance</td>
<td>Public hospital medical specialists</td>
<td>Either mailed or online survey</td>
<td>Members of the Association of Salaried Medical Specialist in New Zealand, representing 21 District Health Boards, were approached to participate in the study. Out of 3402, 1761 questionnaires were completed (RR = 52%).</td>
</tr>
</tbody>
</table>
Table 3.3  Instrument development and psychometric properties

<table>
<thead>
<tr>
<th>Author</th>
<th>Item generation and response scales</th>
<th>Psychometric properties (validity, reliability, scoring)</th>
<th>Final domains of the instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrable (1992)</td>
<td>Items identified based on quality assurance activities that are established in the legal framework and hospital bylaws. Initial item list was pilot tested with ten quality experts. Items used categorical and open-ended questions regarding the existence of QI activities.</td>
<td>Not reported in this article</td>
<td>Five key domains of quality assurance were identified: 1) Criteria Audit, 2) Indicator inventory, 3) Occurrence screening, 4) Occurrence reporting, and 5) Utilization review management</td>
</tr>
<tr>
<td>Binsaeed (1995)</td>
<td>26 Items were identified based on relevant quality assurance literature. Items used a five-point Likert scale assessing perceptions regarding existing quality improvement activities.</td>
<td>Validity testing was limited to assessment of construct validity. Explorative factor analysis identified 4 factors. Multiple regression was used to assess the impact of these factors. Assessment of reliability not reported in the article.</td>
<td>1) Leadership commitment, 2) Quality assurance components, and 3) Resistance and Information</td>
</tr>
<tr>
<td>Graz (1996)</td>
<td>49 items were identified through a series of meetings with clinical leaders in clinical medicine. Some of the questions pertained to actual activities of quality measurement and improvement, and other to opinions or attitudes towards quality assurance.</td>
<td>Not reported in this article</td>
<td>Following Donabedian’s classification: 1) Structure, 2) Process, 3) Outcome, and in addition a section on 4) Characteristics of respondent and department</td>
</tr>
<tr>
<td>Author</td>
<td>Item generation and response scales</td>
<td>Psychometric properties (validity, reliability, scoring)</td>
<td>Final domains of the instrument</td>
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<tr>
<td>Weber (1997)</td>
<td>Not reported in this article</td>
<td>Not reported in this article</td>
<td>4 domains were assessed: 1) The current quality structure, 2) Information about the 'lead' quality department, 3) Redesign of the quality structure, and 4) An opinion questionnaire about their quality model</td>
</tr>
<tr>
<td>Parker (1999)</td>
<td>Overall, 72 items were generated. The QI implementation measure (42 items) was conceptually based on criteria related to the Malcolm Baldridge Award. Respondents were asked to indicate the extent to which they agreed to given statements. The measure for top management commitment measure (10 items) was not explained. The measure for organizational culture (20 items) was the Zammuto-Krakower Culture Inventory. The first two measures used a 5-point Likert scale, in the third measure the respondent was asked to distribute 100 points among descriptions.</td>
<td>Reliability and validity of this instrument were not reported in this article, but reference to previous testing is made.</td>
<td>3 domains were assessed: 1) Degree of quality improvement implementation, 2) Top management commitment, and 3) Organizational culture; The quality improvement implementation consisted of 5 categories: 1) Role of managers, 2) Information and analysis, 3) Strategic quality planning, 4) HRM and development, and 5) Management of process quality</td>
</tr>
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- Table 3.3 continues -
<table>
<thead>
<tr>
<th>Author</th>
<th>Item generation and response scales</th>
<th>Psychometric properties (validity, reliability, scoring)</th>
<th>Final domains of the instrument</th>
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<tr>
<td>Wagner (1999)</td>
<td>47 items were generated based on the domains of the Dutch Quality Award and the input of quality experts from different health care fields. Items used three to four point Likert-type and nominal scales that focus on concrete quality improvement activities.</td>
<td>Validity testing includes assessment of construct validity using exploratory factor analysis and multi-group confirmatory factor analysis. Five factors were extracted explaining 36% of overall variance. Assessment of reliability using Cronbach’s Alpha yielded values from 0.69 - 0.82 (slightly different responses from other health sector providers than hospitals. Based on responses to individual items hospitals were grouped into four stages corresponding to the development of the quality improvement system.</td>
<td>1) Quality assurance documents, 2) Patient involvement in quality improvement activities, 3) Process control based on standards, 4) HRM, and 5) Quality improvement procedures</td>
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<td>Lee (2002)</td>
<td>43 items were generated based on the Malcolm Baldrige National Quality Award Criteria and the CQI pyramid. The survey also included 20 items from the Zammuto and Krakower culture survey. A panel of directors of quality improvement departments identified items corresponding to technical aspects of quality improvement (quality training, implementation of information technology, self-rating of process orientation, use of scientific measurement), strategic issues and structural characteristics of quality improvement (existence of department, budget for CQI, FTE CQI employees). Items use a 5-point-Likert-scale (strong disagreement - strong agreement).</td>
<td>Validity testing not reported in this article. Testing for internal consistency yielded values of Cronach’s alpha ranging from 0.75 - 0.93. Domains are not weighted, a mean score is computed across the 7 dimensions.</td>
<td>1) Leadership, 2) Strategic quality planning, 3) Customer satisfaction, 4) Information and analysis, 5) HRM, 6) Quality management, and 7) Performance results</td>
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<td>Author</td>
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<td>Hennequin-LeMour (2003)</td>
<td>17 items were included referring to a set of standards already in place, but also items adapted to the specific quality criteria of the hospital. Items used binary responses (yes/no) and multiple choice response options (ranges of percentages).</td>
<td>Details on psychometric testing are not reported in the article.</td>
<td>Main themes included in the set of quality requirements: 1) Management, 2) Quality management, 3) Equipment and consumables, and 4) Hygiene and safety</td>
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<td>Wagner (2006)</td>
<td>The instrument contains 39 items, that use Likert-like scales with two to four ordinaly scaled response options to assess specific quality improvement activities.</td>
<td>Details on the validity testing is not reported in the article, but a reference to previous work is made. Cronbach’s alpha reliability coefficients for the five factors range from 0.71 to 0.86: Quality policy documents: 0.78, Human resources management: 0.76, Using Guidelines: 0.71, Patient participation in QM: 0.86, Quality improvement activities: 0.80.</td>
<td>Five focal areas: 1) Availability of quality policy documents, 2) Human resources management, 3) Using guidelines, 4) Patient participation in QM, and 5) Quality Improvement activities</td>
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<td>Kunkel (2007)</td>
<td>The questionnaire includes 18 items, based on results from a previously performed interview study and pilot test. Items used a 7-point scale (1 = &quot;to a low degree&quot;, 2 = &quot;to a high degree&quot;) to reflect existing quality structures, processes and outcomes.</td>
<td>Psychometric testing includes exploratory factor analysis (3 factors confirmed), confirmatory factor analysis results demonstrated good construct validity and structural equation modelling. All relationships were significant among factors. Cronbach’s alpha reliability coefficients were 0.8 or higher for all factors.</td>
<td>Based on Donabedian there were 3 domains: 1) Structure, 2) Process, and 3) Outcome</td>
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<td>Sutherasan</td>
<td>76 items were generated based on a literature review and interviews with quality management experts. A first draft of the questionnaire was peer reviewed by 4 researchers. A second version was tested with 30 staff nurses. Respondents were asked to indicate level of agreement with given statements on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree).</td>
<td>Construct validity was tested using principle component analysis and resulted in an 8-factor solution that retained 65 items. Pearson's factor-items correlations were performed. Reliability testing for internal consistency yielded values of Cronbach's Alpha ranging from 0.80 to 0.95.</td>
<td>The questionnaire contained 8 factors: 1) Education and training (12 items), 2) Leadership (13 items), 3) Drivers (8 items), 4) Continuous quality improvement culture (8 items), 5) Interaction &amp; participation (7 items), 6) Support and recognition (6 items), 7) Cooperation &amp; participation (6 items), and 8) Monitoring the results (5 items)</td>
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<tr>
<td>Cohen</td>
<td>173 items were generated based on a review of the literature and a review of current quality improvement models, national initiatives, including IHI and Leapfrog group. Items are mostly scaled to express agreement with the existence of quality improvement mechanisms and activities.</td>
<td>Detailed psychometric testing is not reported in the article as it mainly reports on individual items.</td>
<td>1) Hospital commitment to QI, 2) Quality practices and processes, 3) Staff involvement and training in QI, 4) Quality of care measures and reporting, 5) QI activities and methods, and 6) Clinical QI strategies and approaches</td>
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<tr>
<td>Macinati</td>
<td>43 items were identified following earlier work of Saraph et al., 1989 and Raju et al., 2002 and Dilber et al., 2005. A pilot was performed to test for adequacy and efficiency with 5 providers. 5 items on hospital performance were added. Most items use a 5-point Likert type scale, 2 items are dichotomous, and 2 items are open.</td>
<td>Exploratory factor analysis yielded 6 factors that explained 72% of total variance, of which employee participation accounted for 43% of global variance. Pearson's correlations coefficients were calculated to assess association between QMS factors and performance factors. Internal consistency was assessed using Cronbach's alpha (for all QMS factors higher than 0.70).</td>
<td>8 Dimensions (called &quot;core elements&quot;): 1) Top management commitment to quality, 2) Quality strategic planning, 3) Personnel development, 4) Employee participation, 5) Information and data for quality, 6) Coordination and presence and role of quality department, 7) Supplier quality management, and 8) Process management</td>
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<td>Kunkel (2009)</td>
<td>23 items were identified based on an operationalization following Donabedian's framework (structure, process, outcome). Items are scaled on a seven point ordinal scale from low to high.</td>
<td>Confirmatory factor analysis of structure, process and outcome dimensions validated in earlier article; Convergent and discriminant construct validity reported. Cronbach's Alpha ranged from .79 and .78, but one factor had only two items.</td>
<td>Dimensions: 1) Structure, 2) Process, 3) Outcome, 4) Implementation prerequisites, 5) Cooperative implementation, and 6) Source of initiative</td>
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<tr>
<td>Lombarts (2009)</td>
<td>113 items were identified based on previous research on QI (questionnaires COMAC, EXPERT, WAGNER), literature review, review of accreditation manuals, other MARQUIS studies (cross-border care components). A panel of researchers and clinicians reviewed the questionnaire. Items include dichotomic or four point scales with different response categories. All items were weighted according to the PDCA cycle.</td>
<td>Factors based on theory confirmed in a forced-factor analysis by weighting questions on PDCA. Secondly, correlations between factor loadings are reported (0.30-0.82), followed by hypothesis testing using groups in either first or last quartile. Assessment of internal consistency yields Cronbach's alpha for each of the seven scales, ranging from 0.54 to 0.89. Interrater reliability (self-report and audit for selected questions and hospitals) was assessed yielding 76.3% agreement. Individual domains are not weighted but individual items are weighted according to PDCA. Calculation of mean score for each domain and an overall mean score from 1 (most mature) to 4 (least mature).</td>
<td>Seven Dimensions (theoretical grouping): 1) Policy planning and documents (20 items), 2) Leadership (36 items), 3) Structure (19 items), 4) General QI activities (8 items), 5) Specific QI activities LABS (20 items), 6) Patient involvement (6 items), and 7) Accountability (4 items)</td>
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<td>Author</td>
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<td>Briner (2010)</td>
<td>28 items of clinical risk management were identified based on literature reviews and expert panel. A draft version of the questionnaire was discussed with clinical risk management practitioners in major Swiss hospitals. Different answer categories were used: 4-point Likert scale (1 = not at all true, 4 = true), 3-point rating scale (yes/planned/no), 5-level development stage (1 = precontemplation, 5 = maintenance stage), 5-point rate for diffusion (1 = true for all services, 5 = not true for any services). Mostly asked for verifying facts, and only a few items asked for opinion.</td>
<td>The questionnaire was validated by comparing its items and the responses in interviews with CRM experts.</td>
<td>The monitoring instrument contained three sections: 1) Implementation and organizational integration of clinical risk management (CRM) (8 items), 2) Strategic objectives and operational implementation of CRM (13 items), and 3) Overview of CRM in different services (7 items).</td>
</tr>
<tr>
<td>Specchia (2010)</td>
<td>A total number of 179 items was identified. First a systematic review of scientific literature was performed, best practices were identified and questions were formulated to assess these selected practices. The questionnaire was validated in a pilot study. A multidisciplinary project team was established (6 physicians, 1 expert in governance, 1 software developer). The measure uses a combination of dichotomous and Likert-type and factual multiple choice questions.</td>
<td>Validity testing is not reported except a focus on content validity by extracted information from literature review and involving experts in instrument design. Internal consistency of the measurement scales takes values of Cronbach's Alpha between 0.61 and 0.90. A score from 0 to 100 is then computed based on the area weight influenced by underlying evidence.</td>
<td>Generic criteria: 1) Resources and services management, 2) Learning culture, 3) Research and development, 4) Information technology; Specific quality criteria: 5) Evidence based medicine, 6) Accountability, 7) Clinical audit, 8) Clinical performance measurement, 9) Appraisal and improvement of clinical activities, 10) Health technology assessment, 11) Quality systems, 12) Risk management, and 13) Information, citizen's/patient's involvement.</td>
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<tr>
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<td>Psychometric properties (validity, reliability, scoring)</td>
<td>Final domains of the instrument</td>
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<td>Gauld (2011)</td>
<td>11 items and 8 background questions were identified, based on a draft questionnaire that was peer-reviewed by 6 researchers and 10 medical specialists and then pilot-tested among 22 medical specialists. The items are scaled on a 3-point scale (0 = no extent, 2 = a great extent) or binary response scale.</td>
<td>The authors report Pearson's correlations between items and final index score (ranging from 0.60 to 0.75) and internal consistency (Cronbach's Alpha = 0.80). Seven items were summed for each individual, and then averaged over all respondents from the same hospital to form the Clinical Governance Development Index. The Clinical Governance Development Index could range from 0 - 100 %</td>
<td>No domains were reported, only that there was a Clinical Governance Development Index</td>
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</tbody>
</table>


Annex 3.1 Data extraction criteria

General characteristics
- Name of the instrument
- Main author or lead organization
- Country of origin where instrument was developed
- Year of data collection
- Setting for which the instrument was developed
- Objective of the study
- Domains of the instrument
- Type of respondent
- Mode of administration

Methodological properties and quality
- Sampling strategy and response rate
- Data source
- How were items derived
- User involvement in measure development
- Total number of items
- Assessment of validity
- Assessment of reliability
- Response scale
- Burden of data collection
- Weighting of domains
- Aggregate scoring
- International use
- Cultural and linguistic adaptations

Quality management implementation
- Accounting for context: does the instrument capture the influence of external factors on quality management implementation
- Adaptations for type of organization: are adaptations of the instrument available for different types of organizations, departments etc
- Deployment: Does the instrument aim to assess to what extent quality management efforts have been implemented systematically throughout the organization

A review of quality management system assessments
Effect and effect size: Does the instrument assess impact on quality of care outcomes, costs, organizational routine etc
Assessment of sensitivity to change: can changes in quality improvement implementation be detected by the instrument
Assessment of sustainability: Does the instrument assess sustainability of quality management efforts
## Annex 3.2 Assessment of methodological quality

<table>
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A = Abstract and title: Did they provide a clear description of the study?
B = Introduction and aims: Was there a good background and clear statement of the aims of the research?
C = Method and data: Is the method appropriate and clearly explained?
D = Sampling: Was the sampling strategy appropriate to address the aims?
E = Data analysis: Was the description of the data analysis sufficiently rigorous?
F = Results: Is there a clear statement of the findings?
G = Transferability or generalizability: Are the findings of this study transferable (generalizable) to a wider population?
H = Implications and usefulness: How important are these findings to policy and practice?
1 = Good
2 = Fair
3 = Poor
4 = Very poor

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A review of quality management system assessments 105
Is having quality as an item on the executive board agenda associated with the implementation of quality management systems in European hospitals: a quantitative analysis. 

Executive board’s quality-agenda and quality management systems

Published as:
Abstract

Objective
To assess whether there is a relationship between having quality as an item on the executive board’s agenda, perceived external pressure (PEP) and the implementation of quality management in European hospitals.

Design
A quantitative, mixed method, cross-sectional study in seven European countries in 2011 surveying CEOs and quality managers and data from onsite audits.

Participants
One hundred and fifty-five CEOs and 155 quality managers.

Setting
One hundred and fifty-five randomly selected acute care hospitals in seven European countries (Czech Republic, France, Germany, Poland, Portugal, Spain and Turkey).

Main outcome measures
Three constructs reflecting quality management based on questionnaire and audit data: (i) Quality Management System Index, (ii) Quality Management Compliance Index and (iii) Clinical Quality Implementation Index. The main predictor was whether quality performance was on the executive board’s agenda.

Results
Discussing quality performance at executive board meetings more often was associated with a higher quality management system score (regression coefficient $b = 2.53; SE = 1.16; P = 0.030$). We found a trend in the associations of discussing quality performance with quality compliance and clinical quality implementation. PEP did not modify these relationships.

Conclusions
Having quality as an item on the executive board’s agenda allows them to review and discuss quality performance more often in order to improve their hospital’s
quality management. Generally, and as this study found, having quality on the executive board’s agenda matters.

4.1 Introduction

Executive boards in hospitals are under increasing pressure to assure and improve the quality of care delivered to patients. They have to improve management systems to meet the demands of a wide range of stakeholders [1]. External pressures such as accreditation [2, 3], publicly available performance data [4, 5] and market competition [6] have been associated with organizational changes. Since executive boards have the responsibility of daily management of the hospital, external pressures can play a pivotal role in the prioritization and agenda-setting of the executive board. Agenda setting is considered to be the starting point of prioritization and decision-making [7], and having quality on the agenda should allow executive board members to review and discuss the quality and performance of the services they deliver to patients.

However, it is not self-evident that executive boards drive the quality and safety agenda within their organizations. Executive boards tend to primarily focus on the hospital’s financial health, at the expense of considering quality and safety issues [8–10]. The lack of active engagement of executive boards in quality of care aligns with the growing concern that (financial) incentives within health care systems are often failing to support quality improvement (QI), i.e. the business case for quality is lacking [11].

In previous studies, the executive board’s engagement was found to be associated with the successful implementation of QI projects [12–14], for example, by facilitating a supportive IT system [15] and stimulating clinical involvement in total quality management [16]. Executive board’s engagement was also found to be associated with adequately funded and systematically evaluated quality management systems [17, 18]. A quality management system has been defined as a set of interacting activities, methods and procedures used to monitor, control and improve the quality of care [19], and is considered to be a prerequisite for the successful implementation of single QI projects [20] and to achieve sustainability. There are different ways to assess quality management systems [21], but whichever assessment was used, the implementation of quality management systems
appeared to differ between hospitals [20, 22–25]. Thus far, it remains unclear why
the implementation of quality management systems differs.

Against this background, the aims of our study were to (i) determine how often
executive boards have quality performance as an item on the agenda, (ii) investigate
the relationship between having quality on the board agenda and the
implementation of quality management in hospitals, and finally to (iii) explore the
influence of external pressure on this relationship.

4.2 Methods

4.2.1 Participants

This study was part of the ‘Deepening our Understanding of Quality improvement in
Europe (DUQuE)’ project, funded by the EU 7th Research Framework Program [26].
Its aims and methods are described elsewhere [27]. The study used a multi-method,
cross-sectional design to collect quality-related information from European hospitals
between May 2011 and February 2012 [27]. Seven countries were included based
on a mix of health and hospital system financing and organization criteria in
different geographical areas in Europe. The participating countries comprised the
Czech Republic, France, Germany, Poland, Portugal, Spain and Turkey. In each
country, 30 hospitals were randomly recruited, subject to them having more than
130 beds and that they treat acute myocardial infarct, hip fracture, stroke and
deliveries patients [27].

4.2.2 Measuring the constructs

We sent a questionnaire to the Chief Executive Officers (CEOs) to assess how
frequently quality performance was an item on the executive board’s agenda: (i)
ever, or during, (ii) a few, (iii) most, or (iv) every meeting.

The implementation of hospital-wide quality management was measured using
three constructs that focused on (i) organization-wide systems, (ii) compliance and
(iii) clinical quality efforts. The implementation of the quality management system
was determined by the construct Quality Management System Index (QMSI) [28].
This was based on the quality manager questionnaire and consists of (i) quality
policy documents, (ii) quality monitoring by the board, (iii) training of professionals,
(iv) formal protocols for infection control, (v) formal protocols for medication and patient handling, (vi) analysing performance of care processes, (vii) analysing performance of professionals, (viii) analysing feedback patient experiences and (ix) evaluating results. The QMSI ranges from 0 to 27. The level of compliance was measured using the construct Quality Management Compliance Index (QMCI) [29]. It is based on audit data and assesses (i) quality planning, (ii) monitoring patient/professional opinion, (iii) monitoring quality systems and (iv) improving quality by staff development. The QMCI ranges from 0 to 16. Third, the Clinical Quality Implementation Index (CQII) [29], which is also based on audit data, assesses (i) preventing hospital infection, (ii) medication management, (iii) preventing patient falls, (iv) preventing patient ulcers, (v) routine testing of elective surgery patients, (vi) safe surgery practices and (vii) preventing deterioration. The CQII ranges from 0 to 14.

4.2.3 Perceived external pressure

Perceived external pressure (PEP) reflects the CEO’s perception of the influence external factors from outside the hospital have on the hospital’s quality management system. Since there was no validated scale to measure PEP, we asked experts from the participating countries to provide an overview of pressures applicable to hospitals in their country. We identified 18 different external influencing factors (Table 4.1). Because the meaning of these factors might differ across national cultures and regulatory environments, the items were discussed with the national coordinators from each country as part of the translation process. In the questionnaires, CEOs could indicate how much they considered each single item to have influence on their quality management system (0 = no influence; 1 = moderate influence; 2 = major influence). The composite measure of PEP was constructed by the sum score of 18 external influencing factors. Items were not weighted since it was beyond the scope of this study to determine which factors are more important than others. The composite measure for PEP ranges from 0 to 36.

4.2.4 Data collection process

Country coordinators approached and recruited hospitals for this study. Hospital coordinators forwarded passwords to the CEO and quality manager to access the web-based questionnaires. In total, 188 hospitals agreed to participate.
Questionnaires were completed by 177 (RR = 94%) CEOs and 188 quality managers (RR = 100%). We collected audit data during onsite visits within a subsample of 12 hospitals that were randomly selected from the 30 participating hospitals per country.

4.2.5 **Statistical analyses**

Data cleaning was performed prior to the statistical analyses. In our data, 53 out of 188 (28.19%) hospitals were missing at least one value for QMSI and 84 out of 188 (44.68%) of hospitals were missing at least one of the external influencing factors that were used to build the PEP score. In order to mitigate this, we used multiple imputations to obtain data sets that were complete on subscale variables used to build QMSI and PEP. The estimated values were based on the items that were completed by the respondent and on the same item answered by other respondents. Instead of a single fixed value, multiple imputations replace missing values with a set of plausible values to represent practical uncertainty [30]. It generated five complete data sets and these were used to construct scores of QMSI, QMCI, CQII and PEP for hospitals that missed less than half of the variables used to build each scale. Hospitals missing more than half of the variables were excluded from the analyses. This allowed us to increase our final sample size to 155 hospitals. Since only two CEOs indicated that they never discussed quality performance, we combined this answering category with ‘during few meetings’ in further analyses. Audit data (i.e. QMCI and CQII) were collected in 63 of the 155 hospitals. Descriptive statistics were calculated to describe hospital characteristics (teaching status, ownership and size) and demographic characteristics of participating CEOs and quality managers (gender, age and number of years in job). Descriptive statistics are also reported for the QMSI, QMCI and CQII (outcomes) and how often was quality on the board’s agenda (predictor) in the analysis.
Questionnaires were completed by 177 (RR = 94%) CEOs and 188 quality managers (RR = 100%). We collected audit data during onsite visits within a subsample of 12 hospitals that were randomly selected from the 30 participating hospitals per country.

Data cleaning was performed prior to the statistical analyses. In our data, 53 out of 188 (28.19%) hospitals were missing at least one value for QMSI and 84 out of 188 (44.68%) of hospitals were missing at least one of the external influencing factors that were used to build the PEP score. In order to mitigate this, we used multiple imputations to obtain data sets that were complete on subscale variables used to build QMSI and PEP. The estimated values were based on the items that were completed by the respondent and on the same item answered by other respondents. Instead of a single fixed value, multiple imputations replace missing values with a set of plausible values to represent practical uncertainty [30]. It generated five complete data sets and these were used to construct scores of QMSI, QMCI, CQII and PEP for hospitals that missed less than half of the variables used to build each scale. Hospitals missing more than half of the variables were excluded from the analyses. This allowed us to increase our final sample size to 155 hospitals.

Since only two CEOs indicated that they never discussed quality performance, we combined this answering category with ‘during few meetings’ in further analyses.

Audit data (i.e. QMCI and CQII) were collected in 63 of the 155 hospitals. Descriptive statistics were calculated to describe hospital characteristics (teaching status, ownership and size) and demographic characteristics of participating CEOs and quality managers (gender, age and number of years in job). Descriptive statistics are also reported for the QMSI, QMCI and CQII (outcomes) and how often was quality on the board’s agenda (predictor) in the analysis.

**Figure 4.1** The DAG shows the relationship between the frequency of having quality on the executive board’s agenda and the implementation of quality management.

Hospital confounders are teaching status, ownership, the number of beds and the country the hospital is situated in. PEP is the CEO’s perception of external pressure on the hospital’s quality management system. PEP is hypothesized to by a modifier of the relationship between the quality agenda and quality management.

We used the Directed Acyclic Graph (DAG) shown in Figure 4.1 to guide our analysis. We analysed the relationship between the frequency of having quality on the executive board’s agenda (predictor) with the implementation of quality management as measured by QMSI, QMCI and CQII (outcomes). We used linear random intercept models to estimate associations between each of our three outcomes (QMSI, QMCI, CQII) and the frequency of quality on the agenda and to assess whether PEP modified this predictor–outcome relationship. Models included a random intercept for country in order to account for clustering of hospitals within countries. We also adjusted for hospital confounders such as CEO background in health care, hospital teaching status, ownership type and number of beds because we expect that these variables might influence the frequency of having quality on the agenda. To determine statistical differences, the level of significance was set at
5%. All statistical analyses were carried out in SAS (version 9.3, SAS Institute Inc., NC, USA, 2001).

4.3 Results

4.3.1 Quality on the executive board’s agenda

As can be seen in Table 4.2, the 155 hospitals are non-teaching (55.5%) and teaching (44.5%), and 80% of the hospitals are publicly owned. The executive boards comprised eight members on average. Further analyses showed that the average number of executive board members in France and Spain is more than 10, while in Germany, Poland and Portugal, boards have four or five members (not in the table). CEOs indicated that the executive boards have 36 official meetings per year on average, and 54% had quality performance on the agenda during most meetings. Seventy-nine per cent of the executive boards had at least one member with medical background.

4.3.2 Quality management

The implementation of quality management was described by QMSI, QMCI and CQII. As shown in Table 4.2, the average score on QMSI was 19.16 (±4.48) on a scale of 0–27. This means that the majority of hospitals fully implemented quality activities in at least one unit. The QMCI score was 10.52 (±3.18) on a scale of 0–16, meaning that the majority of hospitals demonstrated compliance to a set of activities to plan, control and monitor quality of care. Hospitals scored 8.39 ± 2.99 on CQII (on a scale of 0 to 14), meaning that protocols existed in most of the seven areas of clinical quality efforts, but that they were less frequently monitored and measured.

4.3.3 Perceptions of external pressure

On the whole, CEOs indicated that their hospital’s quality management system is only moderately influenced by external pressures (PEP score = 19.49 ± 5.88 on a scale of 0–36), with an inter-quartile range of 8.6 between the first and the third quartile. ‘Governmental policy’ and ‘legislation for internal quality systems’ were perceived to have the most influence (Table 4.1), which were similar for all seven
countries. Albeit that the external factors that appeared to have the least influence were missing more frequently, the missing values were not considered systematic.

<table>
<thead>
<tr>
<th>External Influencing Factors</th>
<th>Mean (SD)</th>
<th>Floor (% with lowest score)</th>
<th>Ceiling (% with highest score)</th>
<th>Frequency of missing data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governmental policy on quality and safety in health care</td>
<td>1.59 (0.57)</td>
<td>4</td>
<td>63</td>
<td>1</td>
</tr>
<tr>
<td>Legislation for internal quality systems</td>
<td>1.56 (0.58)</td>
<td>5</td>
<td>59</td>
<td>4</td>
</tr>
<tr>
<td>Public health, sanitary inspection</td>
<td>1.46 (0.64)</td>
<td>8</td>
<td>53</td>
<td>3</td>
</tr>
<tr>
<td>Hospital accreditation</td>
<td>1.45 (0.77)</td>
<td>16</td>
<td>59</td>
<td>7</td>
</tr>
<tr>
<td>Quality system certification (ISO 9004)</td>
<td>1.37 (0.76)</td>
<td>16</td>
<td>51</td>
<td>8</td>
</tr>
<tr>
<td>Statutory inspection to maintain institutional license, registration</td>
<td>1.33 (0.73)</td>
<td>15</td>
<td>46</td>
<td>5</td>
</tr>
<tr>
<td>Accreditation of clinical training</td>
<td>1.29 (0.68)</td>
<td>12</td>
<td>40</td>
<td>7</td>
</tr>
<tr>
<td>Publication disclosure of hospital performance data (e.g. public hospital comparisons, star ratings or league tables)</td>
<td>1.23 (0.61)</td>
<td>9</td>
<td>32</td>
<td>6</td>
</tr>
<tr>
<td>Public relations, media pressure</td>
<td>1.12 (0.63)</td>
<td>14</td>
<td>25</td>
<td>8</td>
</tr>
<tr>
<td>Market competition advantage</td>
<td>1.03 (0.68)</td>
<td>20</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>Requirements for public liability, malpractice insurance</td>
<td>0.90 (0.72)</td>
<td>24</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>Clinical professional associations, colleges, societies</td>
<td>0.87 (0.63)</td>
<td>25</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Professional chambers/regulators</td>
<td>0.85 (0.69)</td>
<td>30</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>Health insurance funds</td>
<td>0.78 (0.76)</td>
<td>37</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>Technology assessment bodies e.g. HAS, NICE, SIGN</td>
<td>0.71 (0.78)</td>
<td>43</td>
<td>17</td>
<td>21</td>
</tr>
<tr>
<td>Condition for access to funding e.g. as “preferred provider”</td>
<td>0.66 (0.76)</td>
<td>45</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td>Hospital associations</td>
<td>0.57 (0.65)</td>
<td>47</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>Ombudsman</td>
<td>0.57 (0.64)</td>
<td>46</td>
<td>7</td>
<td>17</td>
</tr>
</tbody>
</table>

* All External Influencing Factors were rated on a scale range of 0-2; 0=no influence, 1=moderate influence, and 2=major influence.

Table 4.1 Descriptive Statistics for items used to calculate the Perceived External Pressure score (N=155)
Table 4.2  Descriptive Statistics for the outcome, predictors, and characteristics of hospitals, CEOs, and quality managers used in the analysis (N=155).\(^1\)

<table>
<thead>
<tr>
<th>Hospital Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Status, N (%)</td>
<td></td>
</tr>
<tr>
<td><em>Non-teaching</em></td>
<td>86 (55.48)</td>
</tr>
<tr>
<td><em>Teaching</em></td>
<td>69 (44.52)</td>
</tr>
<tr>
<td>Ownership, N (%)</td>
<td></td>
</tr>
<tr>
<td><em>Private</em></td>
<td>31 (20.00)</td>
</tr>
<tr>
<td><em>Public</em></td>
<td>124 (80.00)</td>
</tr>
<tr>
<td>Number of Beds, N (%)</td>
<td></td>
</tr>
<tr>
<td>≤200</td>
<td>15 (9.68)</td>
</tr>
<tr>
<td>201-500</td>
<td>66 (42.58)</td>
</tr>
<tr>
<td>501-1000</td>
<td>48 (30.97)</td>
</tr>
<tr>
<td>&gt;1000</td>
<td>26 (16.77)</td>
</tr>
<tr>
<td>Number of official Board meetings per year, Mean (SD)(^1)</td>
<td></td>
</tr>
<tr>
<td>36.34 (24.80)</td>
<td></td>
</tr>
<tr>
<td>Frequency of quality performance on the agenda of Board meetings, N (%)</td>
<td></td>
</tr>
<tr>
<td><em>Never on the agenda for meetings</em></td>
<td>2 (1.29)</td>
</tr>
<tr>
<td><em>Few meetings</em></td>
<td>43 (27.74)</td>
</tr>
<tr>
<td><em>Most meetings</em></td>
<td>84 (54.19)</td>
</tr>
<tr>
<td><em>Every meeting</em></td>
<td>26 (16.77)</td>
</tr>
<tr>
<td>Perceived External Pressure [range 0–36], Mean (SD)(^2)</td>
<td></td>
</tr>
<tr>
<td>19.49 (5.88)</td>
<td></td>
</tr>
<tr>
<td>Quality Management System Index [range 0–27], Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>19.16 (4.48)</td>
<td></td>
</tr>
<tr>
<td>Quality Management Compliance Index [range 0–16], Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>10.52 (3.18)</td>
<td></td>
</tr>
<tr>
<td>Clinical Quality Implementation Index [range 0–14], Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>8.39 (2.99)</td>
<td></td>
</tr>
<tr>
<td>Sex, N (%)</td>
<td></td>
</tr>
<tr>
<td><em>Male</em></td>
<td>132 (85.16)</td>
</tr>
<tr>
<td><em>Female</em></td>
<td>23 (14.84)</td>
</tr>
<tr>
<td>Age (years), Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>52.64 (6.80)</td>
<td></td>
</tr>
<tr>
<td>Number of years as in job, Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>5.03 (4.33)</td>
<td></td>
</tr>
<tr>
<td>Background in health care</td>
<td></td>
</tr>
<tr>
<td><em>No</em></td>
<td>14 (9.03)</td>
</tr>
<tr>
<td><em>Yes</em></td>
<td>141 (90.97)</td>
</tr>
</tbody>
</table>

1. Audit data was collected in 63 of 155 hospitals in this study. Hospital characteristics of these 63 hospitals were similar to those of the 155 hospitals.

2. Information on number of executive board members missing in 11 hospitals.

3. Information on number of executive board meetings in the last year missing in 10 hospitals.
### Hospital Characteristics

<table>
<thead>
<tr>
<th></th>
<th>CEO</th>
<th>QM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of official Board meetings per year, Mean (SD)</td>
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<td></td>
</tr>
<tr>
<td>Frequency of quality performance on the agenda of Board meetings, N (%)</td>
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<td></td>
</tr>
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<tr>
<td>Few meetings</td>
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</tr>
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<td>84 (54.19)</td>
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<td></td>
</tr>
<tr>
<td>Perceived External Pressure [range 0 – 36], Mean (SD)</td>
<td></td>
<td>19.49 (5.88)</td>
</tr>
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<td>19.16 (4.48)</td>
</tr>
<tr>
<td>Quality Management Compliance Index* [range 0 – 16], Mean (SD)</td>
<td></td>
<td>10.52 (3.18)</td>
</tr>
<tr>
<td>Clinical Quality Implementation Index* [range 0 – 14], Mean (SD)</td>
<td></td>
<td>8.39 (2.99)</td>
</tr>
</tbody>
</table>

### Respondent characteristics

<table>
<thead>
<tr>
<th></th>
<th>CEO</th>
<th>QM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex, N (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>132 (85.16)</td>
<td>48 (30.97)</td>
</tr>
<tr>
<td>Female</td>
<td>23 (14.84)</td>
<td>107 (69.03)</td>
</tr>
<tr>
<td>Age (years), Mean (SD)</td>
<td>52.64 (6.80)</td>
<td>45.01 (8.81)</td>
</tr>
<tr>
<td>Number of years as in job, Mean (SD)</td>
<td>5.03 (4.33)</td>
<td>4.61 (3.16)</td>
</tr>
</tbody>
</table>

### Background in health care

<table>
<thead>
<tr>
<th></th>
<th>CEO</th>
<th>QM</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>14 (9.03)</td>
<td>--</td>
</tr>
<tr>
<td>Yes</td>
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<td>--</td>
</tr>
</tbody>
</table>

---

1. Audit data was collected in 63 of 155 hospitals in this study. Hospital characteristics of these 63 hospitals were similar to those of the 155 hospitals.
2. Information on number of executive board members missing in 11 hospitals.
3. Information on number of executive board meetings in the last year missing in 10 hospitals.
4.3.4 Quality as an item on the executive board’s agenda and the implementation of quality management

Table 4.3 details the regression coefficients, standard errors and P-values from the multivariable adjusted regression models of frequency of having quality performance on the executive board’s agenda as predictor of QMSI, QMCI and CQII. After adjusting for CEO background in health care and hospital characteristics (teaching status, ownership type and size), hospitals where the executive boards had quality on the agenda during every meeting scored 2.532 units higher on QMSI compared with hospitals where executive boards that discussed it during few meetings or never (SE = 1.16; P = 0.03). We also looked at modification effect of PEP on the relationship between the frequency of having quality on the agenda and QMSI by redoing the analysis without PEP, but did not find a significant effect.

Table 4.3 also details the regression coefficients for the frequency of having quality performance on the executive board’s agenda as predictor of QMCI. Although our results were non-significant, we observed positive associations between frequency of quality on the agenda and QMCI. No effect or modification effect was found for PEP on the association between the frequency of having quality on the agenda and QMCI.

All else held constant, on average CQII score was higher when executive boards had quality performance on the agenda during most meetings (b = 1.81, SE = 0.77, P = 0.02) or during every meeting (b = 1.85, SE = 1.16, P = 0.11), when compared with hospitals where quality was discussed never or at a few meetings. We did not find a modification effect of PEP on this relationship.
Table 4.3  Regression coefficients (standard errors) for the associations of having quality performance on the executive board’s agenda and hospital level quality measures QMSI, QMCI and CQII, and the modifier PEP

<table>
<thead>
<tr>
<th></th>
<th>QMSI(^1) (N = 155)</th>
<th>QMCI(^1) (N = 63)</th>
<th>CQII(^1) (N = 63)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b (SE)</td>
<td>P-value</td>
<td>b (SE)</td>
</tr>
<tr>
<td>Frequency of quality on executive board’s agenda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Every meeting</td>
<td>2.53 (1.16)</td>
<td>0.030</td>
<td>1.23 (1.32)</td>
</tr>
<tr>
<td>Most meetings</td>
<td>1.62 (0.78)</td>
<td>0.040</td>
<td>0.86 (0.90)</td>
</tr>
<tr>
<td>Never/few meetings</td>
<td>(ref)</td>
<td>(ref)</td>
<td>(ref)</td>
</tr>
<tr>
<td>Perceived external pressures score (PEP)</td>
<td>0.06 (0.06)</td>
<td>0.364</td>
<td>0.03 (0.08)</td>
</tr>
</tbody>
</table>

\(^1\) Adjusted for country, CEO background in health care, hospital teaching status, ownership type, number of beds. Interaction effects of the quality agenda and PEP (Perceived External Pressure) were not significant for any outcome measure and therefore not shown.
4.4 Discussion

The aim of this study was to assess how frequently executive boards in European hospitals have quality as an item on their agenda, and whether this frequency is associated with the implementation of hospital quality management. We have demonstrated that executive boards which take an interest in quality performance, as indicated by having the item on the agenda, are more likely to have a quality management system in place.

Agenda-setting is an important aspect of prioritization [7], and ultimately for hospital governance. In order to take action, executive boards should receive information about quality performance, review and discuss it during meetings, and make the right decision accordingly [31]. Having quality as an item on the executive board’s agenda is also important symbolically as it signals their quality orientation to the rest of the hospital, and obtains more resources than those who do not [32]. Therefore, having quality as an item on the agenda fits well within QI cycles. Frequent discussions of quality performance demonstrate that executive boards consider quality of care to be an important topic and provides the opportunity to ascertain the implementation of the quality management system. The association with quality management could also mean that having a widely implemented quality management system requires executive boards to have many meetings to cover all its different sub dimensions. Either way, discussing quality performance seems to be an essential lever for implementing and sustaining hospital-wide quality management. The non-significant trend with compliance (QMCI) and clinical implementation (CQII) of quality management could be attributed to the lower number of hospitals participating in the audit study. However, in order to get a better understanding of the role of executive boards and medical specialists in quality management, further and more sustained research is needed to investigate the relationship with quality strategies at pathway level.

Also this article reports on the CEO’s ranking of PEP. Although we did not find a modification effect of PEP, we did find that CEOs experienced pressure from external factors. Where external pressure from patient demands, financial pressure and market competition increases, executive boards are under increasing scrutiny to shift their focus in decision-making processes [33–35]. For example, publicly reported performance data can lead to increased managerial commitment to quality of care, reshape organizational priorities, and create a sense of accountability [5]. In
previous studies, quality management systems were found to be more apparent in hospitals that were subject to accreditation and certification [36, 37].

Limitations
Common limitations of the DUQuE Project are described elsewhere [27]. Our study has a number of specific limitations. First, the information we obtained via questionnaires was based on self-reported data, which might induce socially desirable bias and false-positive results. We tried to minimize this by designing factual questions rather than asking for personal opinions as much as possible. By using different data sources, we tried to avoid the common problem of method variance. Second, our aggregation methods could have influenced the outcome of the regression analyses. However, we used validated scales as much as possible. Third, international research on external pressure needs to take into account and control for important confounding contextual and local contingent differences across countries that may influence the findings. Therefore, we corrected for country differences in the analyses. So far, we have not been able to find an instrument that aims to include in a single tool the capacity to rank the perceived importance of different types of external pressure. It is not the goal of this paper to validate this instrument, but this publication appears to be the first attempt to measure this concept. Last, we collected quantitative rather than qualitative data. Albeit that qualitative research could give more insight in what is discussed when quality performance is on the executive board’s agenda, and how the required information is acquired and used, for now it is a promising start to have determined the aforementioned relationships quantitatively.

Practical implications
Executive boards are legally responsible for the hospital’s quality performance, and this article demonstrates that they can make a difference. Frequent discussions of quality performance in the executive board room will keep them informed and stimulate the implementation of quality management. Our pan-European study design, including public teaching and nonteaching hospitals, provides important cross-national lessons for hospitals as they seek to improve the quality of care they deliver to patients.
4.5 Conclusions

Having quality on the executive board’s agenda allows them to review and discuss quality performance more often in order to improve their hospital’s quality management. Generally, and our study supports this, having quality on the executive board’s agenda therefore matters.

Acknowledgements

Special thanks go to M. Car and M. Saluvan for their theoretical contribution to this paper.
Having quality on the executive board’s agenda allows them to review and discuss quality performance more often in order to improve their hospital’s quality management. Generally, and our study supports this, having quality on the executive board’s agenda therefore matters.

Special thanks go to M. Car and M. Saluvan for their theoretical contribution to this paper.

References


Using performance indicators for quality management

Published as:
Abstract

**Background:**
Hospitals are under increasing pressure to share indicator-based performance information. These indicators can also serve as a means to promote quality improvement and boost hospital performance. Our aim was to explore hospitals’ use of performance indicators for internal quality management activities.

**Methods:**
We conducted a qualitative interview study among 72 health professionals and quality managers in 14 acute care hospitals in The Netherlands. Concentrating on orthopaedic and oncology departments, our goal was to gain insight into data collection and use of performance indicators for two conditions: knee and hip replacement surgery and breast cancer surgery. The semi-structured interviews were recorded and summarised. Based on the data, themes were synthesised and the analyses were executed systematically by two analysts independently. The findings were validated through comparison.

**Results:**
The hospitals we investigated collect data for performance indicators in different ways. Similarly, these hospitals have different ways of using such data to support their quality management, while some do not seem to use the data for this purpose at all. Factors like ‘linking pin champions’, pro-active quality managers and engaged medical specialists seem to make a difference. In addition, a comprehensive hospital data infrastructure with electronic patient records and robust data collection software appears to be a prerequisite to produce reliable external performance indicators for internal quality improvement.

**Conclusions:**
Hospitals often fail to use performance indicators as a means to support internal quality management. Such data, then, are not used to its full potential. Hospitals are recommended to focus their human resource policy on ‘linking pin champions’, the engagement of professionals and a pro-active quality manager, and to invest in a comprehensive data infrastructure. Furthermore, the differences in data collection processes between Dutch hospitals make it difficult to draw comparisons between outcomes of performance indicators.
5.1 Introduction

External accountability has become increasingly important over the last few years. As a result, hospitals are under increasing pressure to share indicator-based performance information with the government, regulatory bodies, health insurers and the general public. Hospital performance indicators facilitate patient choice and hospital-insurer contracts and promote public accountability. Public disclosure has already become common in, for example, the US and UK, where the data are increasingly based on clinical information from patient records [1]. Although patients do not seem to use publicly disclosed performance information to the full extent, it does appear to encourage hospitals to improve quality of care [2, 3].

There are major differences between countries in how the underlying data of performance indicators are collected and published. For example, in the Veterans Health Administration in the US, external contractors collect data from hospitals quarterly by auditing their electronic patient records [2]. In The Netherlands, on the other hand, indicator scores are self-reported by hospitals, which means that hospital employees collect and compute the data themselves. The way performance indicators are computed affects their reliability and validity [4]. To our knowledge, the present study is the first qualitative interview study that actually targets the characteristics of performance indicator collection processes of various hospitals, in a so-called ‘self-report country’. Given the increasing pressure of public accountability, there is an obvious need for empirical evidence regarding the methods of healthcare quality measurement.

Performance indicators for external accountability can also serve as a means to promote quality improvement and boost hospital performance [5]. For example, a natural experiment that covered thousands of hospitals in the US, pointed out that hospitals engaged in public reporting and pay-for-performance were more often involved in quality improvement projects [6]. External accountability, then, stimulates hospitals to put more effort in improving their performance.

Consequently, the assumption is that there should be a link between hospitals’ performance indicators for external accountability and the use of these indicators for internal quality management purposes. Hence, the processes of data collection, indicator calculation and reporting for external accountability must be linked to internal quality management processes. After all, monitoring specific indicators seems to improve the performance, while failing to do so does not [7]. For example,
a European quantitative study shows that hospital CEOs feel compelled by pressures of external accountability to improve their quality management system [8].

It is to be assumed that, in order to facilitate effective data collection of performance indicators, responsibilities need to be assigned and procedures formalised. An important aspect of quality management is the availability of information about the processes of care delivery, as this provides input for improvement strategies. In a quantitative study in Dutch hospitals, however, the reliability and validity of the underlying data were found to be ambiguous due to the differences in data collection and data infrastructures [4], and the liberties taken in interpreting indicator definitions [9]. A quantitative study in The Netherlands shows that self-reported performance indicators for external accountability are largely implausible due to imprecise and inaccurate data collection [10]. A literature review shows that little is known about hospitals’ use of publicly released performance data for quality management [2]. In another literature review, De Vos and colleagues find that effective strategies for implementing performance indicators in quality improvement do seem to exist although that the internal use and effect of performance indicators varies [11]. Nevertheless, it remains unclear how hospitals produce performance indicator data and to what extent these indicators are used for internal quality management.

To that end, our aim was to explore hospitals’ use of performance indicators for internal quality management activities. In 14 hospitals in The Netherlands, we investigated the arrangements that were made for performance indicator data collection and to what extent they were used for internal quality management activities. The objectives were articulated in the following research questions:

1. What are the arrangements for data collection of performance indicators for external accountability in 14 hospitals?
2. To what extent are these indicators used for internal quality management activities?
3. Which factors explain possible differences between hospitals in how they use performance indicators for internal quality management?
5.2 Methods

5.2.1 Setting

In The Netherlands, performance indicators are submitted to various external parties. For example, the Dutch Health Care Inspectorate (IGZ) sets and monitors the minimum standards for quality, and requires hospitals to deliver approximately 62 performance indicators to allow patients to choose their preferred supplier. Additionally, every health insurer has their own set of performance indicators. For the Dutch Health Care Transparency Program (DHTP), hospitals are obliged to publicly report approximately 115 performance indicators, covering 42 diseases. For each disease, a set of indicators was developed by expert groups on the basis of medical guidelines.

To get a better understanding of the data collection processes, we chose to focus on indicator sets of two conditions: 1) knee or hip replacement surgery, and 2) breast cancer surgery. These indicator sets were investigated at the orthopaedic and oncologic surgery departments, respectively. These conditions were selected because they have both department-specific as generic indicators such as nosocomial infections and blood transfusions. We focused on the indicators that were constructed within the hospital’s data infrastructure, excluding questionnaires on patient experiences. The corresponding data infrastructure and data collection processes for the indicators of these two conditions were considered to be generalizable for indicator sets of most conditions that are used for external accountability. Therefore, these two conditions were considered to be representative for the data collection and use in Dutch hospitals.

5.2.2 Study sample and interviewees

This study was part of a larger study that aimed to investigate the validity, reliability and usability of performance indicators in Dutch hospitals [4,10,12]. All 97 hospitals in The Netherlands are private not-for-profit organisations. To better understand the use of performance indicators for quality management, we conducted interviews with key respondents such as quality managers and medical specialists. We chose interviews over a quantitative approach to learn more of the practical elements attributing positively or negatively to the use of performance indicators for quality management.
From the 42 participating hospitals in the larger study, a purposive sample of 22 hospitals was approached to participate in the current qualitative interview study, ensuring a balance between smaller and larger hospitals. Eventually 14 hospitals agreed to participate. These six teaching and eight non-teaching hospitals varied in size, geographical location and data infrastructure. In total, 11 departments of oncology and 11 departments of orthopaedic surgery agreed to participate. Heads of departments were asked to select senior professionals to participate voluntarily. A criterion was that the interviewees have a good overview of the arrangements and the use of performance indicators for internal quality management. We interviewed quality managers in each participating hospital to get a better understanding of the quality management system at hospital level. To learn more of day-to-day practice at department level, we aimed to talk to medical specialists, nurses and quality management staff at each participating department. Eventually, we were able to conduct 72 semi-structured interviews with 21 medical specialists (11 orthopaedic and 10 oncologic surgeons), 13 nurses, 31 employees of quality management staff (quality managers, data managers) and seven other employees (manager, department heads) between January and June 2012 (Table 1).

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Using performance indicators for quality management
5.2.3 Content and conduct of interviews

In the semi-structured interviews we used an interview guide (see Appendix) that aimed to learn more about the data collection processes, indicator score calculation methods and the influencing factors. Quality managers were asked about how the performance indicators were used at hospital level, whilst professionals were asked about the use at department level. The interviews took 30 to 60 minutes and were conducted at the respective hospitals. DB, GtA and HA are health services researchers and GtA also has a background in nursing. For the purpose of open discussions, respondents were assured confidentiality.

5.2.4 Coding and analysis

Our study design was neither inductive (developing theory) nor deductive (testing theory). Our aim was primarily to explore the practice-variation of quality management and to understand the underlying mechanisms that lead to this variation. To get a sense of the practice variation, we chose to summarise instead of transcribe the audiotaped interviews. We considered that the summaries suffice in exploring the practice-variation and to better understand the influencing factors attributing positively or negatively to the use of performance indicators for quality management. A previous study showed that audiotapes and field notes allow researchers to determine if the summary is an accurate reflection of the interaction in the interview [13]. To assure the accuracy of our summaries, DB, GtA and HA each summarised, compared and discussed five interviews. After consensus was reached about the summaries, DB summarised the other interviews.

The interviews were analysed using predetermined categories: 1) tasks and responsibilities about data collection processes are appointed to stakeholders, 2) procedures are formalised in order to determine who is doing what at a given time, and 3) to what extent performance indicators for external accountability were used for internal quality management. We considered these categories to reflect structure (tasks and responsibilities), process (formalised procedures) and outcome (actual use in practice) aspects of a mature quality management system. We defined a number of elements that we could attribute to each category. For each element we formulated a code. DB coded all summaries using MAXQDA 7 software. Subsequently, DB and GtA independently analysed the interviews to determine which of the elements of each category was mentioned during the interviews. The
combination of these elements allowed us to learn more about how performance indicator data were collected and used for quality management in each hospital. To determine practice-variation between hospitals and departments, DB and GtA gave positive or negative scores when the abovementioned responsibilities and procedures were in place or not. DB and GtA discussed their scores till consensus was reached. In the results section, findings are illustrated by selected quotes that are translated into English.

5.3 Results

Our key finding was that hospitals had different ways of arranging performance indicator data collection, and using -and not using- it for internal quality management. The level of formalisation of responsibilities and data collection processes were not in tune with the use for internal quality management activities.

5.3.1 Arrangements for data collection of performance indicators for external accountability

Formal arrangements were made for the tasks and responsibilities in the data collection processes. Medical specialists and nurses were responsible for the registration in patient charts, although some indicated it is a burden to register all required data elements. They felt that every minute spent on administration is a minute spent less on patients. As a result, some medical specialists chose to spend their time predominantly on patients, leading to less complete patient records. Only a few hospitals made arrangements concerning registration completeness.

“For each indicator we appointed someone who is responsible for it, together with their supporting staff.” (quality manager, H3)

The formalisation of procedures was generally achieved by setting up protocols. In these protocols, tasks for data collection are specified, responsibilities are appointed to individuals and the processes are reviewed regularly. For example, one hospital formalised these tasks and responsibilities by adding the names of the responsible persons to certain tasks. Subsequently, when a task appeared to need more attention, the person responsible was easily identified and reminded of that task.
In other hospitals, however, the data collection processes were not formalised. This meant that the quality manager would not have an existing data set at the annual indicator scores submission for external accountability. Quality manager were therefore preoccupied to retrieve the data from patient charts and to calculate the indicator scores in the preceding months. In general, data came from different sources, which make it difficult to collect these data for calculating indicator scores. Subsequently, there were hospitals that decided to report 100% compliance on several indicators without calculating the actual score.

“At patient level you can assume that a treatment is given when there is a protocol for it. So a 100% score for that indicator is never checked.” (quality management staff, H10)

“For some of the indicators I report 100%, because we have protocols for them.” (quality manager, H12)

“Antibiotics is always given prior to incision according to protocol. I’m absolutely certain about that! You cannot continue to the next shackle in the chain without checking if everything is okay. However, I have no idea what our actual performance is on this indicator.” (orthopaedic surgeon, H13)

5.3.2 Using performance indicators for internal quality management

Use for quality management at department level (oncology and orthopaedic surgery)

At an oncology department, performance indicator data are used twice a year in a meeting with all employees who were involved in the care for breast cancer patients, and the medical specialists have six meetings a year involving quality performance. When their performance appeared to stay behind, they tried to improve the underlying processes.

“About two years ago we reported an estimated score of 100% for antibiotics before surgery. When we actually started measuring, it appeared to be 50%. Since then we improved our procedures and now there is around 90% compliance.” (quality manager, H11)
However, indicators are not always used for quality management.

“I do not think the collected data play an important role in my work, because I usually know more or less how well things are going; this is how we do things around here.” (oncology surgeon, H14)

A similar perception was observed in other hospitals. In one of the teaching hospitals, the orthopaedic surgeon indicated that one of their research assistants collects data for research projects, but that the findings are not shared with the department before the results are published in a scientific journal. The department does not have performance indicator data other than the research data.

“Our quality manager collects the data once a year. In the meantime, we do not know if we are performing well according to the guidelines. Once we receive the information from the quality manager, and it appears that we perform below par, then nothing changes.” (orthopaedic surgeon, H1)

Use for quality management at hospital level
It was mentioned that indicators were used for quality management at hospital level. Generally, the quality manager draws up a report to get the official approval of the executive board to submit it annually for external accountability. A quality manager indicated that the external accountability lead to a change in the mind set of employees.

“After a low score on a national hospital ranking, our doctors and nurses became more aware of the importance of performance indicators, and they became more cooperative in terms of data registration and collection.” (quality manager, H4)

Other executive boards also used indicators for internal quality management. For example, performance indicators were discussed every three months in a meeting with the department heads.
5.3.3 Factors explaining the differences between hospitals in using performance indicators for internal quality management

Champions as linking pins

In a few cases, employees considered it their duty to collect data and to share it with their colleagues. These ‘champions’ can be considered the linking pins between data collection and its use for quality management activities, i.e. ‘linking pin champions’. One of the interviewed nurses was such a linking pin champion. She was very dedicated to collect the data correctly, so she spent much time after working hours to manually copying specific data from the patient charts into a self-made Excel sheet. Then, she used this Excel sheet to inform the medical specialists at her department about their performance. In the interview, however, she acknowledged that this was not a sustainable situation because it relied solely on her involvement.

“When I would get promoted to another function or transferred to another department, then there is no one who knows where to find the data and no data will be given to the medical specialists.” (nurse at oncology department, H7)

In another hospital, a nurse with an IT background aligned the nurses’ electronic patient record when guidelines were updated. For example, when an extra step was added to a guideline, the nurse added this step into the electronic patient record. And because it was an important step, the nurse made it obligatory to fill it in so that the nurses could not forget to work according the new guideline.

“The nurses are now working with electronic patient records, but the orthopaedic surgeons are still working with paper records. But that is something that I’m working on to change.” (orthopaedic nurse, H11)

A pro-active role of the quality manager

The interviews showed that quality managers carried out their role differently. Some of them merely collected data for the annual reporting of performance indicators for external accountability, while others were more pro-active. There was a quality manager who had a reactive approach.
“On the oncology department the improvements are initiated by some of the employees themselves. My role is just to collect the data.” (quality manager, H14)

Another quality manager was more pro-active and pushed the executive board’s quality agenda.

“I think it’s important that the board knows about our quality performance. Therefore I frequently make an update, print it out and put it on the CEO’s desk.” (quality manager, H13)

The role and position of the quality manager determined their influence on professionals to be held accountable for their quality performance, while influencing the executive board’s quality agenda on the same time. In other words, quality managers either merely pulled data from the patient records for external accountability, or also pushed the quality management agenda. In hospitals where the quality manager was more pro-active, data appeared to be used more systematically for quality management activities, even when data collection arrangements were poor.

Engagement of medical specialists

The use of indicators for quality management at department level seemed to largely depend on the engagement of medical specialists.

“Medical specialists in our hospital really feel that they are responsible for the outcomes of the indicators.” (quality manager, H5)

“Registration in patient charts is part of care delivery.” (oncology surgeon, H8)

However, some medical specialists were sceptical about the validity of few indicators. In practice, they only used indicators that were perceived interestingly. For example, one orthopaedic surgeon indicated that the timing of administering antibiotics prior to hip or knee replacement surgery was not relevant:

“This is not a good indicator. When we score poorly on it, then I do not change anything because I do not think this indicator is important. Indicators
should focus on results, such as the functionality of the patient one year after surgery.” (orthopaedic surgeon, H1)

“If they [fellow orthopaedic surgeons] do not see the link between indicators and the ‘real’ quality of care, then it is hard to convince them to register the underlying data properly.” (orthopaedic surgeon, H4)

Diversity in data infrastructures

Hospitals are free to develop their own data infrastructure. We observed 14 different types of data infrastructures in 14 different hospitals. Patient records were either paper-based, electronic or a combination of both. Even where patient records were completely electronic, the type of software often differed between departments. Hospitals with a cohesive and homogenous electronic data infrastructure, performance indicator scores could be calculated ‘with a click of a button’. A less robust data infrastructure, however, has consequences for the time and efforts to collect performance indicator data correctly.

“We investigated how to improve the communication between different data systems, and it will cost hundreds of thousands of euros to get it done.” (quality management staff, H2)

“We do not have electronic patient records, so it is difficult to collect data from all the different sources.” (quality management staff, H6)

“In this hospital we have one electronic patient record system. To collect the data we have to write the command in our software and then it is just a matter of ‘a click of a button’.” (quality management staff, H9).

Additionally, the more manual labour is needed to collect the data from different sources, the more chances there are in general for making mistakes.
5.4 Discussion

5.4.1 Summary of main findings

In this qualitative study our aim was to gain more insight into the arrangements of data collection of performance indicators for external accountability and its use for internal quality management in 14 hospitals in The Netherlands. Our findings show that hospitals have different ways of collecting data for performance indicators and different ways of using- and not using- these data for internal quality management. Factors such as ‘linking pin champions’, pro-active quality managers and engaged medical specialists seem to make a difference. In addition, a homogenous data infrastructure appears to facilitate the production of usable performance indicators.

5.4.2 Diversity of data collection

The investigated hospitals use different data collection processes. Some hospitals have made arrangements for the collection of performance indicator data; others rely on individuals who are tasked with collecting the corresponding data. Additionally, some hospitals determine the indicator scores by estimation (reporting 100% because of protocol), instead of calculating the scores based on specific numerator and denominator. Reporting a 100% compliance score that is not based on data, does not reflect the quality of care that was actually achieved. As a result, it becomes very difficult to interpret hospital performance, possibly reducing the vaunted effect of market competition. Allowing hospitals to report these kinds of estimated compliance scores hinders the primary goal of transparency: to improve the quality of care. In the light of the usefulness of performance indicators for external accountability, Van Dishoeck and colleagues stipulate that outcome indicators –and rankings especially- are not suitable for hospital comparison because the within-hospital variance appears to be greater than the between-hospitals variance [14]. Additionally, the validity of the indicators can be ambiguous due to different interpretations of definitions [10]. For example, the Health Care Inspectorate and the Dutch Health Care Transparency Program employ different definitions of the indicator ‘tumour positive surgical margin following breast-conserving surgery’, that leads to different notions of how much tumour tissue is acceptable in the surgical margin [15].
The fact that the data for external accountability are self-reported can lead to hospitals getting caught in a transparency paradox: the more is measured, the more can be discussed. Moreover, the diversity of performance indicators also has implications for patients, making it difficult for them to make well-informed choices between hospitals when the indicators do not reliably reflect the hospitals’ actual performances. Performance indicators should be acceptable, feasible, reliable, valid and sensitive to change [16]. In order for performance indicators to be comparable between hospitals and a useful tool for patients, the underlying data infrastructure and the arrangements for data collection need to be formalised.

5.4.3 Linking internal quality management to external accountability

The results of our study show that the potential of performance indicators to support internal quality management activities remains untapped. This runs contrary to the expectation that hospitals’ obligation to report quality performance at least once a year would lead to an increased use of data for internal quality management. After all, monitoring the performance of health care organisations should be an integral part of modern health care [17].

The hospitals in our study have different arrangements and different levels of formalisation with regards to their data collection processes. Even though some hospitals have such processes in place, the usability of the indicators appears to rely on medical specialists’ appreciation of their value. When medical specialists consider the indicator data to be useless, they tend to spend less time and effort on registration in patient records, resulting in poor data quality. A patient record review study in Dutch hospitals shows that the quality of the data registered in patient records was associated with the quality of care delivered to patients [18].

To break away from this vicious circle, the added value of performance indicators should be made clear to medical specialists, provided that only the most relevant indicators are selected. There has been an extensive international debate about which indicators represent quality of care and which combination of indicators validly represents hospital-wide performance with regards to quality of care [19]. Once the added value of data widely recognised, there will be an incentive to optimise the quality of the data. This will result in reliable performance indicators that can be used for quality management.

In cases where data collection processes are not embedded in formalised protocols, factors such as ‘linking pin champions’ may still make it possible to
produce indicator data and to use it as input for quality management. Individuals are different in their ability to champion change, which makes it crucial for organizations to identify those front runners who are likely to react positively to innovations [20]. Additionally, professionals are more likely to adopt innovations effectively in the presence of champions as boundary spanners [21]. Apparently, linking pin champions can make a difference as front runners and boundary spanners to adopt new practices, even when processes are not formalised. Moreover, the engagement of medical specialists played a pivotal role in the use of performance indicators at the hospitals we investigated. They appeared to select the indicators they considered to be useful for internal quality management, and based that selection on perceived validity and reliability. Previous research already suggested that quality measures should be meaningful, and that such measures should be part of the clinical workflow [22].

Another trend in the Dutch healthcare system is the vast increase of the amount of performance indicators that hospitals are required to produce. While the Health Care Inspectorate has their own set of indicators, all the insurance companies, patient organisations and condition-specific national bodies are trying to play their part in the transparency dogma by requiring information about an increasing number of performance indicators. These additional indicators are often only slightly different from the existing indicators. This phenomenon feeds the discussion about the disproportionate amount of time doctors have to spend on administrative tasks. This calls for more efficiency, and thus to make better use of the existing indicators, both externally and internally. In Denmark, for example, there is a centralised database with which all Danish hospitals are obliged to share performance indicator data. Subsequently, these data are used to inform the public and to give feedback to the hospitals about their performances. This nation-wide indicator program seems to improve the quality of care [23].

5.4.4 Strengths and limitations

To maximise representativeness, we incorporated a purposive sample of 14 hospitals. Following the 72 semi-structured interviews, we were able to develop a rich qualitative data set. We chose to summarise the interviews instead of transcribing them. As a result, some finer details about the exact processes may have become lost; however, considering the explorative approach of our study, the summaries did allow us to get a general idea about the practical use of indicators in
quality management. We focused on the data collection process and use of a set of
performance indicators for breast cancer and knee and hip replacements. It is
possible that performance indicators for other conditions are collected and used
slightly differently. Due to the underlying care processes of these conditions, the
corresponding data infrastructure and the inclusion of generic indicators of other
hospital-wide health care processes such as nosocomial infections and blood
transfusions, findings for these two conditions were considered to be generalizable
for other conditions and their concomitant indicators. Therefore, these indicator
sets were useful in better understanding the data collection and use for quality
management in Dutch hospitals.

5.5 Conclusions

In The Netherlands, hospitals are obliged to report performance indicators for
external accountability at least once a year. In our qualitative interview study, we
found that performance indicators for external accountability are underused in
internal quality management. For some hospitals, it seems, window dressing is more
important than actual performance. Pressure caused by external accountability does
not automatically result in increased use of indicators for internal quality
management activities. In order to use performance indicators for internal quality
management, hospitals are recommended to focus their human resource policy on
‘linking pin champions’, the engagement of professionals and a pro-active quality
manager. Executive boards can give support by implementing a homogenous data
infrastructure that allows performance indicators to be collected and calculated
based on reliable data. Future research should focus on the sustainable
implementation of performance indicator data in quality management activities. The
diverse practices of data collection and reporting could lead to major comparability
problems between hospitals. Delivering useful performance indicator data for
external accountability takes a great deal of time and effort. It would be a waste not
to use it to support internal quality management in its effort to improve the quality
of care.
Acknowledgements
The authors thank all the participants who took part in this research project.

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References


### Appendix

#### Interview guide

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<th>Topic</th>
<th>Example of questions</th>
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<td><strong>Quality policy</strong></td>
<td>Are indicators part of the quarterly meetings with the executive board?</td>
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<tr>
<td></td>
<td>Are the indicators discussed similar to the indicators used for external accountability?</td>
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<tr>
<td></td>
<td>How are indicators fed back to the speciality groups or the heads of departments?</td>
</tr>
<tr>
<td></td>
<td>How are indicators used for improvement projects?</td>
</tr>
<tr>
<td><strong>Data registration</strong></td>
<td>How are patient data registered (electronically/ on paper/ etc.)?</td>
</tr>
<tr>
<td></td>
<td>Can you give a description of the protocol on data registration?</td>
</tr>
<tr>
<td></td>
<td>What can you say about the quality of data registration, in terms of completeness/ accuracy/timeliness/mistakes?</td>
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<tr>
<td></td>
<td>Who checks these registered data, or reports these data, and to whom?</td>
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<tr>
<td><strong>Data collection</strong></td>
<td>How do you apply the definitions of indicators, such as <em>irradicality</em> or the completion time of e.g. door-to-needle?</td>
</tr>
<tr>
<td></td>
<td>How are data collected?</td>
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<td>Who checks these collected data, or reports these data, and to whom?</td>
</tr>
<tr>
<td><strong>Feedback</strong></td>
<td>How are you informed about the performance of your specialty group/department?</td>
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<td></td>
<td>Which information is used for feedback?</td>
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<tr>
<td><strong>Use</strong></td>
<td>What actions follow from this feedback?</td>
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<tr>
<td></td>
<td>How are these actions evaluated?</td>
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General discussion
“From the board room to the bedside and back” adheres to the key issue when it comes to hospital governance, quality management and the quality of care: really creating value for patients. This thesis assessed and analysed the assumed cascade of relationships between hospital governance, quality management and quality of care. In other words: do hospital governance practices matter when it comes to the quality of care delivered? In this concluding chapter the main research question “How does the executive board’s policy follow through to the quality performance at the bed side, and does the information about this performance reach the boardroom for them to optimize their policy?” will be answered. The research findings are discussed in the light of the literature, methodological strengths and weaknesses, and application in practice. At the end of this chapter we provide recommendations for both research and practice.

Main findings

Hospitals are complex organizations, especially when it comes to their governance, let alone their quality management. Executive boards bear the overall responsibility for the hospital’s strategic direction and performance, and have a whole range of pathways to meet up to that challenge. As presented in the general introduction of this thesis, these pathways follow the conceptual model as visualised in Figure 1.

As can be seen in Figure 1, we expected that the policy of the board about the quality of care is carried out into the organization and influences the way quality management activities are prioritized and executed. We also expected that quality management has an effect on quality improvement, and requires the information about quality performance to optimize the improvement activities. The information about improvement processes and the outcome of quality performance are supposed to be discussed and used in the boardroom to respond with optimal mission accordingly. The studies in this thesis provided answers to the research questions, as presented below.
Main research question: "How does the executive board’s policy follow through to the quality performance at the bedside, and does the information about this performance reach the boardroom for them to optimize their policy?"

Improve quality of care from the boardroom to the bedside and back. That is, executive boards having quality on the agenda is associated with the implementation of quality management systems. Discussing quality allows them to review and respond to quality performance. This requires doctors and nurses to share information about quality performance, but also about other quality-related issues such as the progression of quality improvement projects. Subsequently, the executive board needs the system to gain information about where the hospital is going on the path to quality of care, and the system needs the board to gain momentum throughout the organisation by promoting and pushing the hospital’s quality agenda.
1. How has hospital governance taken shape in the Netherlands and does it affect quality performance?
Hospital governance has evolved over the last decades, also in The Netherlands. Research evidence indicates that hospital boards in the past were not necessarily oriented towards improving quality performance, and that a business case for quality was lacking [1]. However, our study shows that trustees and executive boards of hospitals in the Netherlands were reasonably oriented towards quality of care. With the limited set of variables studied, we were unable to find a relationship between quality orientation and hospital performance, there is growing evidence on the positive influence of executive boards on improving quality of care [2-4]. Hence, our conclusion is that executive boards should continue discussing quality performance in the boardroom and future research should focus on investigating the underlying mechanisms of improving the quality of care.

2. To what extent do Dutch medical specialists share information with executive boards, and how are responsibilities for clinical governance divided?
In many countries, medical specialists are key stakeholders in governing hospitals. This is especially relevant in The Netherlands where about 60% of the medical specialists are not employed by hospitals, but are independent entrepreneurs functioning within the broader hospital organisation. Our study showed that medical specialists in the Netherlands are sharing information with the executive board, but that it is insufficient to comply with the national governance codes. Nonetheless, medical specialists are taking up clinical governance tasks and participate in management activities. In the end, executive boards and medical specialists should make agreements on which quality information is essential to use for policy-making. After all, executive boards have the explicit responsibility for the quality of care. Therefore, our conclusion is that medical specialists should take responsibility for sharing information with their executive board and to be accountable to complying with norms of good practice.

3. How can the implementation of quality management systems be assessed?
Health care providers invest substantial resources to establish and implement hospital quality management systems. Nevertheless, few tools are available to assess implementation efforts and their effect on quality and safety outcomes. In our systematic literature review we found that there is a large variety of
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3. How can the implementation of quality management systems be assessed?
Health care providers invest substantial resources to establish and implement hospital quality management systems. Nevertheless, few tools are available to assess implementation efforts and their effect on quality and safety outcomes. In our systematic literature review we found that there is a large variety of instruments to assess the implementation of quality management systems. In our international study we developed and applied a mixed method of questionnaires and on-site audits, allowing us to assess the level of implementation of quality management systems reliably. Our conclusion is that hospitals can use this mixed method approach to determine their level of implementation, in order to gain relevant information about the areas that require further improvement.

4. What is the association between the board’s quality agenda and the implementation of quality management systems?
Agenda-setting is an important aspect of prioritization [5], and ultimately for hospital governance. In order to take action, executive boards should receive information about quality performance, review and discuss it during meetings, and make the right decision accordingly [6]. Our study showed that quality management systems were implemented to a larger extent in hospitals where executive boards had quality on their agenda. Having quality on the executive board’s agenda allows them to review and discuss quality performance more often in order to improve their hospital’s quality management.

5. What are the arrangements for data collection of performance indicators for external accountability of Dutch hospitals, and how is it used for internal quality management?
Hospitals are under increasing pressure to share indicator-based performance information. These indicators can also serve as a lever to promote quality improvement and quality performance within hospitals. In our qualitative interview study, we found that performance indicators for external accountability are not well used for internal quality management. Albeit that executive boards should support the implementation of a homogenous data infrastructure that allows performance indicators to be collected and calculated based on reliable data, our study also showed that the use of performance indicators for internal quality management relied to a great extent on ‘linking pin champions’. Our conclusion is that individuals can make a difference when the system is not ready yet, but that the arrangements for data collection need to be better structured to assure sustainable quality of care.
Methodological considerations

The various research projects that form the basis of the papers used in this thesis, have several specific limitations that were mentioned in each of the chapters, such as relatively small sample sizes, the cross-sectional design of the projects, socially-desired answers in questionnaires due to self-reporting, and aggregation methods of constructs. Albeit that these limitations were acknowledged and led to more cautious conclusions, there are some more general limitations that need to be taken into account in the interpretation of the overall findings.

Conceptualisation of hospital governance

Hospital governance is an ambiguous concept that needs to be clarified by applying it in a specific context. When the governance is not clear, the probability of strategic error and decreased accountability and responsibility increases [7]. The concept generally refers to achieving direction, control and coordination of the organization [8]. Eeckloo translated this general idea into a definition that focussed on the strategic direction of the hospital and the allocation of resources [9]. However, we chose to take the interpretation of ‘achieving direction, control and organization’ a bit further. We assume that hospital governance is more than putting the chess pieces in place (structure), because it also reflects how the chess pieces move to achieve their goal (process). Therefore, we formulated the following definition of hospital governance: “Hospital governance is the division of tasks and responsibilities for the strategic direction for the hospital (mission, vision, values, goals) amongst the board of trustees, executive board and medical specialists, and using data to fulfil their role in monitoring and improving the hospital’s performance”. However, by including how the pieces move to achieve their goal as a part of our hospital governance definition, our definition might have affected our findings. For example, we considered that having quality on the executive board’s agenda is a proxy for the way they fulfil their responsibility for assuring quality of care. If we would have taken a smaller definition like Eeckloo’s, and only looked at the chess pieces themselves (structure), then we might have found other associations with, for example, implementation of the quality management system. However, we believe that it is more meaningful to know more about both the chess pieces and how they achieve their goal.
Study design

The research on the relationship between hospital governance and quality of care is still at its infancy. This thesis provides new insights and contributes to the debate in the hospital governance arena by taking a descriptive and explorative approach to get an initial glance of how hospitals arranged their governance, and to what extent it was associated with quality management systems and the quality of care. We chose for a multi-method design to be able to cross-reference the quantitative results with qualitative findings. The multi-method design consisted of 1) exploring the hospital governance and possibly associations quantitatively (survey amongst chairs of the board of trustees, executive boards and medical boards); 2) reviewing the current literature on quality management systems, 3) using questionnaires and on-site audits to cross-reference the implementation of quality management systems, and 4) performing a qualitative interview study on the use of performance indicators for quality management.

For descriptive and explorative purposes, investigating the what, the chosen study design allowed us to get a first glimpse on the relationship between hospital governance and the quality of care. For further research investigating the how, other study design could give the opportunity to explore other type of research questions. For example, an observational study on executive board meetings would allow researchers to investigate how decision-making takes place on various topics, and which personal characteristics of individual board members influence this process. These kind of objectives, however, were not within the scope of this explorative thesis, but should be adopted in future research.

Study sample

In collecting data, researchers are dependent on study participants to collect their data, and the willingness of them to participate. Undeniably, this type of data collection entails a hazard for selection bias. After all, participants are free to choose to be part of the study, for whichever reason. One can choose to participate because they have a competitive nature and know that they probably will do well in the research project. The consequence of selection bias can be that the findings are false positive (more than reality) or false negative (less than reality). In this thesis, much of the data were collected from CEOs. Since they are known to be very
busly and therefore difficult to get some of their time, we sent questionnaires to increase the chance of receiving factual and behavioural information about their practices of being the head of a hospital. Albeit that the response rate in our Dutch study was fairly equal to similar studies, the fact that whole hospital sector in the Netherlands consists of about 100 hospitals has consequences for the power of statistics, and therefore for the likelihood of finding significant differences. Perhaps this is one of the reasons that most of the publis hed literature on hospital governance originates from the US and UK? Our international study, the DUQuE project, was an early adaptor on the European stage in terms of investigating hospital governance on an international scale. It is unclear what motivated the hospitals to participate, but it is possible that it resulted in a selection of well performing hospitals. To assure objectivity, we used qualitative interviews in chapter 5 and on-site audits in chapter 4 to cross-reference the findings from the self-reported questionnaire data.

**Generalizability**

There are several generalizability issues that need to be addressed before interpreting the findings of this thesis. First, despite the number of Dutch hospitals we received data from was limited, cross check analyses showed that the sample was representative for the whole Dutch hospital sector. Second, albeit that the DUQuE project did not aim to reach a sufficient sample of hospitals to represent each country, the combinations of hospitals and countries allowed us to reach robust conclusions. After, if an association of two phenomena is found in such a diverse study sample, then there must be a relationship that is more than just statistically significant.

**Interpretation of the findings**

Taking the aforementioned methodological considerations into account, the findings of this thesis will be reflected upon from both a theoretical and practical perspective.
Hospital governance, a tripartite reality in The Netherlands

Executive boards in Dutch hospitals follow the rationale of two-tiered governance model, where the executive board is responsible for the daily management of the hospital, and the board of trustees comprises non-executive board members who oversee the executive board. In general, governance theories such as agency theory, stewardship theory and stakeholder theory assume that executive boards can influence staff to bring about change and improvements [10]. Governance theories emphasize on the roles of executive and non-executive board members in fulfilling their responsibilities for health care organisations.

However, medical specialists should be involved in governance too. Where management follows the theoretical base of bureaucracy, medical specialists typically organise their practice through professionalization [11]. Albeit that Mintzberg’s theory ‘professional bureaucracy’ puts managerial and medical decision-making parallel to each other; even almost independent of each other [12]. To bridge this gap, medical specialists should be drawn into managerial roles, i.e. hybridisation, which additionally is thought to improve hospital performance [13, 14]. In the area of quality management, there currently seems to be a movement towards more internalisation of hybridisation, e.g. managerial control is growing ‘in the minds of medical specialists’ [15]. Additionally, a study in UK hospitals showed that hospitals performed better on various quality-charts when medical specialists were in the executive board [16]. It was theorised that medical specialists bring expertise into board meetings that improve both the content of the decisions and the credibility towards other medical specialists.

Quality orientation in hospital governance

Quality orientation, as described in chapter 1, reflects the attention and prioritisation of executive boards and trustees for the quality of care. From various media coverage we learned that there are still hospitals where the quality of care is perceived below par, and executive boards were blamed. For example, the management of the Staffordshire Hospital in the UK was criticised for the high mortality rates, and the executive board of the Maasstad Hospital in the Netherlands was reprimanded for their lack of focus on quality of care [17]. In chapter 1 we showed that the quality orientation in Dutch hospitals has been...
Growing and that many boards of trustees were engaged with quality-oriented activities such as monitoring quality through dashboards and discussing quality-related subjects with the executive board. However, using quality performance as a topic for the evaluation of the CEO and the prioritisation of quality by boards of trustees did not seem to be related to a hospital’s actual performance on quality-related process indicators (chapter 1). Although we were not able to find a direct relationship between the quality orientation of the board and patient outcomes, we did see in chapter 4 that spending time on quality performance during board meetings is positively associated with the implementation of quality management systems at hospital level. At this point our data do not allow us to attribute this to the CEO directly, and future research should be focussing on such relationships. Furthermore, having quality as an item on the board’s agenda is also important symbolically as it signals the quality orientation to the rest of the hospital, and free up resources to exercise the necessary quality improvement activities [18]. After all, it was Joseph Juran who believed that “overcoming cultural resistance in organisations is key to making quality management philosophy and principles fit for use through implementation and practice” [19].

Taking the phenomenon of quality orientation, it also applies to medical specialists since they play a pivotal role in dividing responsibilities, establishing procedures, sharing performance information about procedural effects and managing the organisation accordingly. Undoubtedly, medical specialists are engaged in their medical profession on the highest level possible, but focussing on their clinical practice does not necessarily mean that the hospital as a whole performs well. Focus is mainly on short service delivery episodes rather than the whole service delivery pathway over a longer period of time as experienced by patients. As a consequence, differences can occur between departments. For example, in terms of patient safety culture, departments within a hospital differed more than the culture between hospitals [20]. Despite the apparent differences between departments, that does not imply that clinical practice should be the only theme medical specialists should focus on. They are also crucial in setting the quality agenda on hospital level. By means of sharing performance information, taking up managerial responsibilities and dividing responsibilities, medical specialists can contribute to the hospital’s quality orientation.
Hospital governance and the influence of external pressure in The Netherlands

In the Netherlands, the hospital sector is a regulated market that functions through competition. This means that the hospitals’ right to exist lies in their own hands, with the underlying rationale that hospitals have a major incentive to perform better than their competition, in terms of quality of care. In order for market competition to lead to better quality of the overall hospital sector, reliable and valid performance information should be available for patient choice and contracting with insurers. In chapter 5, however, we saw that the information that is used for this kind of external accountability is often based on data of different quality. Recent research showed that patients increasingly use information to switch their health insurer, but that they primarily use information about costs instead of quality (21). At the same time, a weakened patient trust in insurers threatens the legitimacy of the current market competition in The Netherlands (22). The transparency that should result from reliable performance information is now still in its infancy. If the government aims to improve the overall quality of care by means of market competition, hospitals should be facilitated in optimizing the quality of data on the one hand, whilst investing in usable quality information for patients on the other.

Scientific bodies of medical specialties and associations also have a responsibility to develop and spread the guidelines and professional codes of conduct to their constituency. But if the associations do have the right tools, are hospitals capable of complying with the codes? It is often the case that new codes are developed and effectuated, but that it takes time and effort for hospitals too, first, understand the ins and outs of the codes, second, translate the codes into their own practical reality, and third, to adapt and redesign the processes and responsibilities. In chapter 1 we found that the majority of the CEOs was aware of the most recent and forceful codes.

We also found that knowing about these codes of conduct does not necessarily imply that the codes are applied in practice. For example, one of the governance codes asks from medical specialists to share a defined list of information to their CEOs, but in chapter 2 we saw that 1) medical specialists not necessarily agree with the added value of sharing all of that information, and 2) that they actually do not share the information, even though it was promoted by their own medical specialist association. When the association for medical specialists enacted the code that included the sharing of information to CEOs, the uptake of this code means that
Exploring the clarity of transparency

The development of performance indicators is part of the movement towards transparency about performance on care delivery to the general public. It was Ernest Amory Codman (1869 – 1940), a surgeon in Boston, who recorded and published diagnostic and treatment errors because he was convinced that this transparency had two functions: 1) to inform the public, and 2) to initiate research on preventing such errors [23]. Transparency should allow patients to choose their preferred hospital, and allow researchers to focus their research projects on preventing or minimizing errors to occur in the future. This should contribute to improvements in the quality of care. Florence Nightingale (1820 – 1910) did just that. She was a nurse and passionate statistician at the Scutari Hospital in Turkey during the Crimean War of 1854 to 1856. Her statistical reports on the mortality of soldiers (the cause was later to be known as infection) lead to sanitary reforms, which resulted in a decreased death rate from 43% to 2% [24].

In the debate on transparency, there is also a counter-argument: the transparency paradox. Ethan Bernstein (2012) described the transparency paradox as “maintaining observability of workers may counter intuitively reduce their performance by inducing those being observed to conceal their activities through codes of conducts and other costly means” [25]. This means that putting a magnifying glass on the performance of individual employees could introduce some sort of self defence mechanism, such as preventing errors to be part of the information that is shared with the public. However, since performance indicators are also used for internal quality management within hospitals, the transparency paradox could have a latent effect on the effectiveness of the CEO’s strategy. After all, performance indicators are part of the information that CEOs need to receive and review in order to make decisions on strategic level.
Managing quality at hospital and department level

A quality management system supports the achievement of quality goals and is the organizational structure, responsibilities, procedures, processes and resources needed to assure and improve the quality of care. It is a system at the hospital level and typically applies to all departments, for example quality policy, quality resources, performance management, evidence-based management medicine and internal quality methods [26]. At department level there are also department-specific quality management activities, such as specialized expertise and responsibilities, evidence-based organisation of pathways, patient safety strategies and clinical reviews [27]. There seems to be a relationship between quality management and quality performance, since the level of implementing quality management systems at hospital level was positively associated with quality improvement strategies at department level [28], and strategies at this level seemed to positively associate with patient outcomes [29].

In terms of professionalization, medical specialists are not only highly specialised in their own field of expertise, but they are increasingly involved in managerial roles [30]. The involvement of medical specialists in management is thought to improve quality of care in US hospitals, because they ‘walked the walk’ [31]. This assumption is vested in the fact that medical specialists bring relevant practice-related knowledge of the primary processes of the hospital to the table, allowing them to deal more successfully with the highly complex dynamics that are typical for hospitals. For example, innovations that should lead to improvements are generally more successful when developed by medical specialists because the innovation is more practice-related, and creates a broad support among fellow professionals in the implementation process [32]. In the implementation process, medical specialists play a pivotal role in the adoption, or hinder, of innovations [33-35]. Moreover, medical specialists with managerial roles, also called ‘hybrids’, can have a primary focus on medical aspects on the one hand, or making decisions from a managerial perspective on the other. Plochg et al. (2012) argued that this focus can result in different types of innovations [36]. Ultimately, however, involving medical specialists in managerial roles will infuse policy and decision-making with the practice-related knowledge. For example, medical specialists can bring their knowledge and experience at the bedside into the board room. This allows hospital governance to become more effective in realizing quality care. After all, it was Kaoru Ishikawa (the great mind behind the well-known ‘fishbone
diagram’ to visualise cause and effect in organisational processes) who theorised that optimising quality requires top-down goal-setting and bottom-up involvement [37].

Reflexion on the findings from a practical perspective

Hospital governance: the latest developments in the Netherlands

The contribution of medical specialists in hospital governance has become even more important given the recent developments in the Dutch hospital sector. Since January 2015, the definition of entrepreneurship by medical specialists was rewritten by the government. The new definition of entrepreneurship implies that medical specialists have a greater entrepreneurial risk, meaning that they share in the financial risks of the hospital. Medical specialists were given the choice to buy themselves in, in the hospital by means of participation, or by reorganising the medical staff into a so-called medical specialist enterprise (MSE). In most of the hospitals, medical specialists chose this form of entrepreneurship. This meant that a new (or should we say “old”, since it reminds us back to the 70s when many hospitals had a reality of two pillars: a medical pillar and a managerial one) dualistic business model arose, with the MSE on the one hand, and the hospital at the other. Both are separate legal entities, but they are strongly interlinked because they have to share the money. After all, the hospital receives all the money from the insurance companies, but has to contract and pay the MSE for delivering specialised care. Not all medical specialists work for the MSE, some of them are still salaried by the hospital. This means that this new reality puts the relationship between hospital and MSE, but also between medical specialists salaried by the MSE versus salaried by the hospital, under pressure. Considering the quality of care, the tasks and responsibilities need to be redesigned in order to achieve the high level of quality performance that is aimed for in the hospitals’ mission statements.

The financial interlinkage between the hospital and MSE has another implication. Since the medical specialists no longer do the contracting with the health insurance companies, the hospitals are now negotiating on behalf of the medical specialists. So hospitals negotiate with the insurance companies for the total amount of money on the one hand, and negotiate with the MSE about the
prices of the specialised care. However, the agreements made on quality of care do not automatically mean that the performance level is secured. After all, who is responsible for it? The hospital, who is the principal in this relationship, or the MSE, who is the agent? Does this draw back on the previously mentioned principal-agent analogy? Not necessarily so. That depends on the way hospitals and MSEs value the performance level on the quality of care. This mutual interlinkage of two independent entities requires a clear division of responsibilities, establishment of procedures, performance information sharing about procedural effects and the management the organisation accordingly. Clinical governance should thus be complementary to hospital governance. Albeit that the new system is only just on its way, and the effects are not yet well understood, the findings of this thesis provide practical implications. As such, executive boards should continue having quality on their agenda, medical specialists should engage in clinical governance, and both should share and use process-related information for quality management at both hospital level and department level.

**From the boardroom to the bedside and back**

Performing on the highest level of quality is something that all hospitals aim for. CEOs have the explicit responsibility for the quality of care delivered in their hospital, whilst medical specialists have taken the oath of Hippocrates to do well to their patients. Taking a closer look at Deming’s plan-do-check-act cycle, it is apparent that check is a crucial phase in improvements. Checking how well the current direction of the hospital’s strategies is going begins with delivering good quality of care. But it does not end there. In order to be able to check whether alterations in strategies and internal investments need to be made, CEOs must receive and review information about the underlying processes and outcomes. Otherwise, the helmsman steers without knowing which direction the ship is going, and thus not knowing which lines to ease or which way to move the helm to. In other words, information has to come up to the helmsman so that proper measures can be taken adequately. In hospitals, the main duty is to provide good practice at the bed, which means that information from the bedside is essential in steering the hospital into the right direction. In Chapter 5 we saw that the registration in patient records, as well as retracting the information from them,
To conclude, this thesis showed that executive boards can make a difference in the quality performance. It appeared to matter if quality of care is discussed in the board room, that the quality management system benefits from the engagement of both the executive board and medical specialists, and that medical specialists can contribute by sharing information about quality of care at the bedside all the way to the boardroom, and use the information for quality improvement initiatives at department level. In the end, quality of care is realized from the boardroom to the bedside and back.

differed tremendously. It varied from one-on-one calculations to rough estimates in determining the score on performance indicators.

**Table 1** Recommendations for research and practice

<table>
<thead>
<tr>
<th>Research</th>
<th>Qualitative research on the topic of hospital governance, for example on the dynamics behind making choices for quality of care.</th>
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<tbody>
<tr>
<td>Board of trustees</td>
<td>Challenge the executive board on quality performance by requesting and critically reviewing quality reports. Additional information about day to day practice can be obtained by having informal talks with medical specialists and nurses.</td>
</tr>
<tr>
<td>Executive boards</td>
<td>Have quality on the agenda and communicate the importance of quality throughout the organization. Make quality performance agreements with medical specialists by having them determine the relevant indicators and norms, and make sure that the underlying information system provides reliable data to make sure the targets are met.</td>
</tr>
<tr>
<td>Medical staff</td>
<td>Be involved in quality policy and help the executive board to get a clearer view on what is important in terms of quality of care, and to help them achieving the hospital’s aims by sharing information on quality of care.</td>
</tr>
<tr>
<td>Medical specialists</td>
<td>Be involved in quality management activities, not only within your unit but also those overarching more than one unit. After all, with patients increasingly presenting comorbid challenges, units will be required to more and more collaborate with other specialities</td>
</tr>
</tbody>
</table>
To conclude, this thesis showed that executive boards can make a difference in the quality performance. It appeared to matter if quality of care is discussed in the board room, that the quality management system benefits from the engagement of both the executive board and medical specialists, and that medical specialists can contribute by sharing information about quality of care at the bedside all the way to the board room, and use the information for quality improvement initiatives at department level. In the end, quality of care is realized from the boardroom to the bedside and back.
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Summary
Every now and again, the media report on cases of mismanagement or dysfunctioning medical specialists in hospitals. Despite all the regulations, codes, recommendations and guidelines of how to do it, why do we still see headlines popping up in the media about unsafely hospitals? Reports about these cases often start with the question: “Where does the responsibility of the medical specialist end, and where does it begin for the executives and trustees?” or “How come nobody noticed this failure, or acted upon it sufficiently?” The main reason seems to be that responsibilities for specific quality-related elements have not been divided clearly enough. But also the fact that assuring quality requires quality management that allows professionals to deliver quality care. Below we will answer the main research question and the underlying research questions.

Main research question: “How does the executive board’s policy follow through to the quality performance at the bed side, and does the information about this performance reach the boardroom for them to optimize their policy?”

Improve quality of care from the boardroom to the bedside and back. That is, executive boards having quality on the agenda is associated with the implementation of quality management systems. Discussing quality allows them to review and respond to quality performance. This requires doctors and nurses to share information about quality performance, but also about other quality-related issues such as the progression of quality improvement projects. Subsequently, the executive board needs the system to gain information about where the hospital is going on the path to quality of care, and the system needs the board to gain momentum throughout the organisation by promoting and pushing the hospital’s quality agenda.

How is the hospital governance taken shape in the Netherlands and does it affect quality performance?

Hospital governance has evolved over the last decades, also in The Netherlands. Research evidence indicates that hospital boards in the past were not necessarily oriented towards improving quality performance, and that a business case for quality was lacking. The aim of Chapter 1 was to describe the hospital governance system in the Netherlands and to determine the quality orientation of executive boards and boards of trustees by means of a web-based survey. In addition, we investigated the relationship between the quality orientation and hospital performance. We observed that there has been a variety of policy guidelines that
promoted good governance. Returned questionnaires from 40 CEOs and 38 chairs of boards of trustees showed that the quality orientation of trustees and executive boards is growing and is widespread throughout many hospitals. However, we were not able to find a relationship between the quality orientation of trustees and executive boards and their hospital’s performance. Hence, our conclusion is that executive boards should continue discussing quality performance in the boardroom and future research should focus on investigating the underlying mechanisms of improving the quality of care.

To what extent do medical specialists share information with the executive boards, and how are responsibilities for clinical governance divided?

In many countries, medical specialists are key stakeholders in governing hospitals. This is especially relevant in The Netherlands where about 60% of the medical specialists are not employed by hospitals, but are independent entrepreneurs functioning within the broader hospital organisation. In Chapter 2 we explored whether aspects of clinical governance, i.e. performance information sharing and clear divisions of responsibilities between medical specialists and executive boards, have been taken up by medical specialists and executive boards in the Netherlands. Between November 2010 and February 2011, the chairs of 67 medical boards and 40 CEOs completed an online questionnaire concerning information-sharing and the clinical governance practices. Almost all respondents acknowledged the importance of information-sharing. However, the actual sharing differed by performance information type. Policy/management information was shared more often than patient care information. Similarly, medical specialists differ in responsibility they take for specific clinical governance tasks. In the end, executive boards and medical specialists should make agreements on which quality information is essential to use for policy-making. After all, executive boards have the explicit responsibility for the quality of care. Therefore, our conclusion is that medical specialists should take responsibility for sharing information with their executive board and to be accountable to complying with norms of good practice.

How can the implementation of quality management systems be assessed?

Health care providers invest substantial resources to establish and implement hospital quality management systems. Nevertheless, few tools are available to assess implementation efforts and their effect on quality and safety outcomes. By means of a systematic literature review, our aims in Chapter 3 were 1) to identify
instruments that assess the implementation of hospital quality management systems, 2) to describe their measurement properties, and 3) to assess the effects of quality management on quality improvement and quality of care outcomes. From the initial 5261 references we deemed eighteen papers eligible for inclusion. Instruments to assess the implementation of quality management systems share a core set of domains (e.g. process management, the role of human resources and leadership and analysis and monitoring), although details of conceptualization and methodological rigor differed substantially. The absence of well-established instruments to measure quality management systems and the methodological shortcomings of existing instruments call for further research. Our conclusion is that hospitals can use this mixed method approach to determine their level of implementation, in order to gain relevant information about the areas that require further improvement.

**What is the association between the board’s quality agenda and the implementation of quality management systems?**

Agenda-setting is an important aspect of prioritization, and ultimately for hospital governance. In order to take action, executive boards should receive information about quality performance, review and discuss it during meetings, and make the right decision accordingly. In Chapter 4 we assessed whether there is a relationship between having quality as an item on the executive board’s agenda, perceived external pressure (PEP) and the implementation of quality management in European hospitals. Returned questionnaires of CEOs and quality managers and audit data from 155 hospitals from seven European countries (Czech Republic, France, Germany, Poland, Portugal, Spain and Turkey) showed that discussing quality performance at executive board meetings more frequently was associated with a higher quality management system score (regression coefficient $b = 2.53; SE = 1.16; P = 0.030$). We also found a trend in the associations of discussing quality performance with quality compliance and clinical quality implementation. PEP did not modify these relationships. Our study showed that quality management systems were implemented to a larger extent in hospitals where executive boards had quality on their agenda. Having quality on the executive board’s agenda allows them to review and discuss quality performance more often in order to improve their hospital’s quality management.
What are the arrangements for data collection of performance indicators for external accountability in Dutch hospitals, and how is it used for internal quality management?

Hospitals are under increasing pressure to share indicator-based performance information. These indicators can also serve as a lever to promote quality improvement and quality performance within hospitals. In Chapter 5 we gained more insight in the arrangements of data collection for performance indicators for external accountability and its use for internal quality management in 14 hospitals in the Netherlands by conducting 72 semi structured interviews with quality managers and medical specialists. Our results showed that hospitals have different approaches to collecting data for performance indicators, and different ways of using, and not using, these data for quality management. Further analyses showed that the level of formalization of the responsibilities and procedures for data collection of the performance indicators was not necessarily associated with a more active use of the same data for internal quality improvement. Factors such as “linking pin champions”, pro-active quality managers and engaged medical specialists seemed to make the difference. In addition, a comprehensive hospital data infrastructure, in terms of electronic patient records and supportive software that contributes to data collection, appeared to be an additional prerequisite to produce reliable external performance indicators that were also actively used for internal quality improvement. Albeit that executive boards should support the implementation of a homogenous data infrastructure that allows performance indicators to be collected and calculated based on reliable data, our study also showed that the use of performance indicators for internal quality management relied to a great extent on ‘linking pin champions’. Our conclusion is that individuals can make a difference when the system is not ready yet, but that the arrangements for data collection need to be better structured to assure sustainable quality of care.

Conclusion

Performing on the highest level of quality is something that all hospitals strive for. CEOs have the explicit responsibility for the quality of care delivered in their hospital, whilst medical specialists have taken the oath of Hippocrates to do well to their patients. Taking a closer look at Deming’s plan-do-check-act cycle, it is apparent that check is a crucial phase in improvements. Checking how well the current direction of the hospital’s strategies is going begins with delivering good quality of care. But it does not end there. In order to be able to check whether alterations in strategies and internal investments need to made, CEOs need to
receive and review information about the underlying processes and outcomes. Otherwise, the helmsman steers without knowing which direction the ship is going, and thus not knowing which lines to ease or which way to move the helm to. In other words, information has to come up to the helmsman so that proper measures can be taken adequately. In hospitals, the main duty is to provide good practice at the bed, which means that information from the bedside is essential in steering the hospital into the right direction. In Chapter 5 we saw that the registration in patient records, as well as retracting the information from them, differed tremendously. It varied from one-on-one calculations to rough estimations in determining the score on performance indicators.

To conclude, this thesis showed that executive boards can make a difference in the quality performance. It appeared to matter if quality of care is discussed in the board room, that the quality management system benefits from the engagement of both the executive board and medical specialists, and that medical specialists can contribute by sharing information about quality of care at the bedside all the way to the board room, and use the information for quality improvement initiatives at department level. In the end, quality of care is realized from the boardroom to the bedside and back.
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Curriculum vitae
Daan Botje was born on the 14th of October 1981 in Doetinchem. He studied Human Movement Sciences at the VU University in Amsterdam, specialising in both ergonomics and rehabilitation. During his master he worked at the Coronel Institute of Occupational Health (Academic Medical Centre, University of Amsterdam) on a project to determine the work demands of employees of a railway company in the Netherlands.

After his MSc. degree in 2009 he started as a health services researcher at Nivel in Utrecht. Within the department Organisation and Quality of Health Care he started his PhD trajectory and focussed on governance and quality management of health care organisations. His special interest goes to the role of trustees, executive boards and medical specialists in quality improvement. In a study amongst Dutch hospitals he investigated the impact of their governance. Since 2010 he was partner of “Deepening our Understanding of Quality improvement in Europe (DUQuE) Project”, which was an international research project that investigated the effectiveness of quality management systems in 188 hospitals in 7 European countries. In 2012 he had the opportunity to collaborate in a qualitative interview study at the department of public health at AMC/UvA for three months. From the midst of 2012 till 2014 he was involved in the project “Information for quality management”, in which management information was developed based on patient chart reviews and multidisciplinary feedback meetings in health care organisations in 3 sectors (hospitals, mental health institutions and nursing homes).

On the 1st of October 2014 he started as a Health Care consultant at Berenschot in Utrecht. As a consultant, he helped developing and implementing relevant management information for a variety of health care organisations (mental health institutions, nursing homes). He was part of a project team that assisted the executive board of the Sociale Verzekeringsbank (SVB) on persoonsgebonden budget (PGB) issues. He developed and implemented a management dashboard that was used for both internal improvement and external accountability.

At the 1st of August 2016 he started as a policy maker at the Quality and Safety Department at the Amphia Hospital in Breda. As a policy maker he is responsible for the development and implementation of the plan-do-check-act cycle at both hospital and department level, and to improve and implement hospital-wide quality and safety policies.
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Publications
Publications


Presentations

1. Masterclass “From the boardroom to the bedside and back” as part of a leadership training for hospital managers in Belgian hospitals. Leuven, 2016.


