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HEA2014-1029

**Quality Management in Hospitals:
Does it Contribute to High Quality of
Care?**

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This paper should be cited as follows:

Dombradi, V. and Godeny, S., (2014) "Quality Management in Hospitals: Does it Contribute to High Quality of Care?" Athens: ATINER'S Conference Paper Series, No: HEA2014-1029.

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Email: info@atiner.gr URL: www.atiner.gr
URL Conference Papers Series: www.atiner.gr/papers.htm
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ISSN 2241-2891
10/07/2014

Quality Management in Hospitals: Does it Contribute to High Quality of Care?

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Abstract

Health policy-makers all around the world are facing the problem of ever-increasing costs in health care. In addition, the demand for high quality care is greater than ever. Since there is no indication that these trends will stop in the near future, the policy-makers have to find methods to mitigate these problems. One possible solution is the development of efficient quality strategies, including external quality assessment and improvement systems that focus on clinical effectiveness, the implementation of evidence based practice, patient safety programs and clinical audit.

The aim of this paper is to identify and summarize research studies which investigate the impact of different quality strategies and quality improvement methods on healthcare activities and outcomes, and to determine if these are effective clinical methods or not. For this reason, a systematic search was carried out in various databases.

The literature suggests that having an external quality assessment system does contribute to better health care. However, most of the studies focus on accreditation alone, and only three relatively low sample studies compare accreditation with ISO certification. Related to clinical-effectiveness, limited relevant results were found.

Health policy-makers should consider different quality models as valid methods to provide high quality of care in hospitals, but they should also be aware that the clinical effectiveness of these has not yet been proven. More outcome-oriented, high sample studies should be carried out which compare one technique to another and find out if some of them could be implemented simultaneously.

Keywords: Health care, hospital, quality, strategies, clinical effectiveness

Introduction

Back in the early 1900s, the entire collection of tools which doctors used for diagnosis and healing could be put into a single medical bag. This was due to the fact that medical science had limited knowledge of how to identify and treat various kinds of diseases, both infectious and chronic. It was an age when the ability to cure was not dictated by one's wealth, but by the lack of scientific understanding. However, this changed rapidly in the last century (Bloch, 1988).

Thanks to the technological revolution, we know more about diseases than ever before, we have more available tools and methods to diagnose and treat patients than ever before, and we live longer than ever before. One may assume that this is a golden age of health care and as time passes it will get even better. However, such changes have their downsides. Although we have great understanding of the nature of diseases, we do not always know how to cure them. This is especially true with chronic disease. Technology allows medical professionals to use cutting edge medicine and equipment; however, the costs of these are often enormous (Chernew et al, 1998). The average age expectancy is increasing: however, with increasing age various chronic diseases come, which prevent the individual from remaining an active working member of society (Schneider and Guralnik, 1990). Finally, there is an ever-increasing need for high quality care among the population. These factors all contribute to the overall increase of expenditure in health care all over the world. In turn, the problem is not with the increasing cost but the fact that the rate of increase is greater than the growth of the world economy. According to the World Bank (The Economist Intelligence Unit, 2011), the public expenditure on healthcare in the EU alone could jump from 8% of GDP in 2000 to 14% in 2030 and continue to grow beyond that date. Unless there is a solution for stopping this trend, the national health care will not be able to provide adequate care for all of its citizens, and high quality care will be a privilege for only those who can afford it.

However, there are a few ways to possibly avoid such scenario (The Economist Intelligence Unit, 2011). One possible way is to wait for science to discover new cost-effective clinical methods to identify and treat chronic diseases which would free the elderly from inertia inflicted by their conditions. But is it a wise strategy for health policy makers to just wait? Another possible way is to acknowledge defeat and to abandon the hope that everyone can have high quality universal health care. This Laissez-faire viewpoint may be appealing to many, but it would abandon the most vulnerable and the system itself would not be prepared to cope with pandemics.

There is also a third option. In the very early 1900s, Henry Ford was able to prove that with the right management skills, with the right incentives and with the standardization of the manufacturing processes, the automobile production could become far more cost-effective, which benefits both the producer and the consumer (Alizon et al., 2009). Ever since, other industries have also adopted this policy and shown similar positive results. Even health care had adopted some of these principals. However, related to this topic, a

question remains open to this very day: Can health care providers accomplish the same success as other industries did? Or is health care inherently different and such strategies are only a waste of time, effort and resources? This paper will try to answer these questions.

Methods

The primary aim of this paper is to identify and summarize research studies, which investigate the impact of different quality strategies and quality improvement methods on activities and outcomes related to hospital care. These findings would help health policy-makers identify the various tools in their “arsenal” and to understand the purpose and nature of these. The secondary aim is to determine if these are clinical- and cost-effective methods or not.

For these reasons, a systematic search was carried out. In the first phase of the search, the following keywords were used: ‘quality’, ‘improvement’ and ‘health care’. These keywords were searched separately within the PubMed and in the Web-of-science research databases. In the second phase, the articles where titles and abstracts were irrelevant were excluded from the research. In the third and final phase, the references of these articles were examined in order to identify more relevant papers and the Web-of-science was used to identify papers which used these articles as references.

Results

The Four Main Quality Models in Health Care

Between 1996 and 1999, the European Commission funded the “External Peer Review Techniques” (ExPeRT) project, where the main goal was to identify and analyze the different quality models used in hospital care throughout the European Union. At the end of the research project, four models were identified: health care accreditation, ISO certification, European Foundation for Quality Management (EFQM) Excellence Model and visitatie (Bohigas and Heaton, 2000). Each model has different history and therefore they have different focus and purpose.

Accreditation is a process whereby a professional association or nongovernmental agency grants recognition to a school or health care institution for demonstrating ability to meet predetermined criteria for established standards (Mosby's Medical Dictionary, 2009). It originates back to 1917, when the American College of Surgeons started implementing the standards made within the Hospital Standardization Program (Scrivens, 1995). Recognizing the value of standardization, the model became very popular. By the end of the century, hospitals in Australia, Canada and in several European countries used accreditation hoping to improve the quality of health care (Heaton, 2000).

Certification is a process in which an individual, an institution, or an educational program is evaluated and recognized as meeting certain predetermined standards. Certification is usually made by a nongovernmental agency. The purpose of certification is to ensure that the standards met are those necessary for safe and ethical practice of the profession or service (Mosby's Medical Dictionary, 2009). ISO certification was developed by the International Organization for Standardization back in 1947 in the United Kingdom. Originally it was developed for manufacturers and industries, but later was adopted by hospitals and laboratories in health care (Heaton, 2000). Until the start of the new millennium, ISO certification was the most used quality model by hospitals within Europe. However, because of the increasing popularity of accreditation, it is losing its dominant position.

In 1988, fourteen European companies created the EFQM model, which was endorsed by the European Commission. Like ISO certification, this model was not originally created for health care providers but was later adopted by them. Among the four quality models in health care, the EFQM is the only model that gives awards for institutions which can prove their dedication to high quality services and production with self-assessment and external review. Because only the best performing institutions get an award, the award becomes a proof of an exceptionally high quality of health care provision (European Foundation for Quality Management, 1999).

The least wide-spread quality model is the visitate developed by the Dutch in 1992. It does not give awards or certification to facilities which undergo and successfully complete the inspection. The model focuses rather on the individuals' medical profession than the organization itself (Heaton, 2000).

Regardless of their differences, the four models also share many similarities. These common features are: voluntary initiation by the institution, self-assessment, agenda or audit plan, evaluation visit, trained reviewer or evaluation team, written or verbal report and evaluation of findings (Bohigas and Heaton, 2000). Because of these similarities, the different quality models do not exclude each other and should not be considered as "rivals". The following quotation, which also summarizes the ExPeRT project, backs up this assumption: *"Regardless of the type of evaluation selected, it must be built on strong and relevant standards and have a strong and credible external assessment component. Both of these must be managed by an organization which itself is subjected to on-going review and assessment (Heidemann, 2000)."*

Key message #1: Researchers do not prefer one quality model to another. It is more important how they are implemented rather than the form of implementation.

Researches Related to Accreditation in Health Care

Among the four quality models, accreditation is the most well researched model. To be more precise, accreditation is the only model whose effects are appropriately and scientifically assessed. On the other side, there are only three articles which investigate the impact of ISO certification, and there is no article addressing the impact of the EFQM or the visitate models. There is no official explanation for this disproportion. The authors of this article assume that this is because (1) accreditation became very popular in the last decade and (2) the more articles there are in accreditation, the more reason it gives to researchers to further investigate this model. Nevertheless, the articles related to accreditation can give us some clue as to how quality models impact the process and outcome of health care in general.

As mentioned above, there are several articles which investigate the impact of accreditation on various outcomes, let it be management, the process in health care, patient or worker impressions or outcomes. To this day, there are two literature reviews which summarize these findings in great depth (Greenfield and Braithwaite, 2008; Hinchcliff et al. 2012). Their findings related to hospital care can be summed up in the following paragraph.

Relating to promoting change and professional development, the literature seems to be consistent in favor of accreditation. However, the literature is inconsistent relating to professions' attitude to accreditation, organizational impact, financial impact, quality measures and program assessment. Finally, there are no sufficient studies to assess the impact of accreditation related to consumer views or patient satisfaction, public disclosure and surveyor issues.

Key message #2: Accreditation is associated with many positive outcomes, however, these findings are inconsistent. Because the studies do not compare accreditation with other models, it is hard to tell if these outcomes are related to the nature of accreditation or to quality models in general.

Accreditation vs ISO Certification

To this day only three studies investigated how accreditation and ISO certification differ in performance. The first study was conducted in 8 European countries under the research project called „Methods of Assessing Response to Quality Improvement Strategies” (MARQuIS). They used statistical methods to determine how the existence of a quality model improves management, patient rights, patient safety, clinical organization, clinical practice, environment and global performance, and if there are any differences between using accreditation or ISO certification (Shaw et al., 2010). 71 hospitals participated in the study. Thirty-four had accreditation only, ten had ISO certification only and twenty had none. Those hospitals that had any kind of quality model (accreditation or ISO certification) performed significantly ($p < 0.05$) better in all examined areas, except for patient rights ($p = 0.072$). When comparing hospitals, which had only accreditation with hospitals that had only ISO certification, they found that accreditation had significantly better results in management ($p = 0.001$), in patient safety ($p = 0.015$) and in clinical practice

($p=0.048$). One possible explanation is that these differences exist because the standards of the accreditation were made for health care, while the standards for the ISO certification were adopted from the industry and manufacturing sectors. Another explanation is that the overall sample size was very small and ISO hospitals were under represented which may have influenced the statistical outcome.

Key message #3: Hospitals with any kind of quality model outperformed the hospitals which had none. Accreditation performed better results than ISO certification in some areas. This is due to the fact that accreditation standards were developed specifically for health care.

The second study was also carried out under the MARQuIS project with 89 hospitals across Europe (Suñol et al., 2009). One of its aims was to investigate the relationship between different kinds of external assessment methods (such as accreditation and ISO certification) and four hospital outputs, like clinical outputs in three different kinds of wards (maternity, surgery and medical), safety, patient-centredness and cross-border patient-centredness. The study was conducted only at ward level. Significant connections were found between teaching accreditation and clinical outputs in medical wards ($p=0.002$), between government accreditation and clinical outputs in medical wards ($p=0.06$) and safety ($p=0.009$), between voluntary accreditation and clinical outputs in medical wards ($p=0.019$), safety ($p<0.001$) and cross-border patient-centredness ($p=0.02$). ISO certification had significant association with patient-centredness ($p=0.02$) and cross-border patient-centredness ($p=0.034$).

Key message #4: Only government and voluntary accreditation had significant association with clinical outputs in medical wards and safety, while only ISO certification had significant connection with both patient-centredness and cross-border patient-centredness.

The third study was done under another research project called “Deepening our understanding of quality improvement in Europe” (DUQuE), which was the continuation of the MARQuIS project (Shaw et al., 2014). The objective of the study was to find out how accreditation and ISO certification impact clinical leadership, evidence-based organizational pathway, patient safety strategies and clinical review in 73 acute care hospitals with a total of 291 services managing acute myocardial infarction (AMI), hip fracture, stroke and obstetric. Of the 73 hospitals twenty-five had only accreditation or was in preparation for it, eleven had only ISO certification or was in preparation, ten had both and twenty seven had none. Using non-accredited and non-certified hospitals as reference, the study found that both accreditation and ISO certification had positive association with clinical leadership, patient safety strategies, clinical review but not with evidence-based organizational pathway. Accreditation seemed to show better results in clinical leadership and clinical

review than ISO certification, however, these differences were not statistically significant. The combination of both models had greater and more significant impact than any model alone. An explanation for this is that hospitals which have both accreditation and ISO certification may have a leadership which is more dedicated to a high quality of care. Another explanation is the very small sample size used during the study.

Key message #5: Hospitals with any kind of quality model had better results in clinical leadership, patient safety strategies and clinical review than the hospitals that had none. Accreditation seemed to perform better than ISO certification, but the differences were not significant. The best results were achieved by hospitals that had both models in place.

Quality Improvement Strategies and Maturity Index

Quality improvement in health care is the combined and unceasing efforts of everyone, to make the changes that will lead to better patient outcomes, better system performance and better professional development (Paul, 2007).

In a study, which was also part of the MARQuIS research project, significant connections were found at ward level between the development level of internal quality improvement strategies and hospital outputs. The six quality strategies assessed were organizational quality management programs, audit and internal assessment of clinical standards, patient safety systems, clinical practice guidelines, performance indicators and systems for obtaining patient views. Outcomes had four dimensions, namely clinical, safety, patient-centredness and cross-border patient centredness (Suñol et al., 2009).

In another research conducted in 43 Spanish hospitals the following connections were found relating to the quality improvement systems and some patient safety indicators: higher development level, or maturity, of a quality improvement system is associated with lower rates of hospital complications and with fewer rates of readmission, although the latter had only borderline statistical significance. Related to hospital mortality and length of stay, no significant connections were found (Groene et al., 2011). This research was done with the quality improvement maturity index questionnaire, which was developed under the MARQuIS project (Lombarts et al., 2009). It is also worth mentioning that because of the very few number of hospitals participating in this study, the researchers in the Spanish study used a statistical method called “bootstrapping” to artificially increase the sample size. Although this is an accepted method in the field of research, this technique slightly alters the results of statistical analysis (Groene et al., 2011).

Key message #6: The development level of a quality improvement strategy is associated with better hospital outputs. Higher maturity of quality improvement systems positively affects some patient safety outcomes in hospital care.

Quality Improvement Programs or Clinical Audits

Clinical audit is a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria. Where indicated, changes are implemented and further monitoring is used to confirm improvement in health care delivery (NICE/CHI, 2002).

During the past years, the studies assessing the clinical-effectiveness and cost-effectiveness of different kind of quality improvement programs have increased considerably. One study for example has proven that continuous quality improvement in pressure ulcer prevention creates a clinical culture of pressure ulcer prevention, resulting in improved patient outcomes and cost savings (Hopper and Morgan, 2014). In a pediatric intensive care unit, the implementation of quality improvement intervention has resulted in reduced nosocomial infection rates, hospital length stay, and mortality (Esteban et al. 2013). In a hospital in Kenya, a quality improvement program related to surgical antibiotic prophylaxis has resulted in moderate reduction in the risk of superficial surgical site infection across all levels of wound contamination and marked reductions in the costs associated with antibiotic use, the number of intravenous injections performed and nursing time spent administering these (Aiken et al., 2013). Similar results were produced in a maternity unit in Pakistan, where a quality improvement initiative related to rational use of antibiotics has resulted in reducing the usage of therapeutic antibiotics from 97% to 8% in one year, while the surgical site infection rates remained less than 5% (Nausheen et al., 2013).

After reading the paragraph above, one may assume that quality improvement methods are a guaranteed way to improve the quality of hospital care and to save money in the long run. However, a study conducted across the British health care system (NHS) has revealed that the staff perceive quality improvement as a time-consuming, additional chore and a managerially driven exercise with no associated professional rewards (Bowie et al., 2010). Furthermore, the management's failure to support and resource changes fuels low motivation and many times the management does not complete all the steps necessary for a successful quality improvement. For example, after implementing a specific change, they do not always check the effects of these.

<p>Key message #7: Quality improvement programs for specific areas have a wide range of positive impacts, including cost savings. However, the leadership must dedicate resources, complete all stages of quality improvement and implement incentives to maximize these effects.</p>

Discussion

The literature suggests that having an external quality assessment system and investing in quality improvement methods provide higher quality of hospital care. Related to the different quality models, a wide range of positive impacts can be identified, however because most of the literature focuses only

on accreditation, it is currently near impossible to determine if the positive findings are related to a specific kind of accreditation, to accreditation in general, to quality models in general or the hospital managers and workers who implement these models. In some articles, health care accreditation slightly outperformed ISO certification, but because of the limited number of studies and the limited sample used in these studies, it is not wise to draw a conclusion about which one is better.

Related to the cost-effectiveness of these quality models, a very limited number of studies was found. These studies focused only on accreditation and had inconsistent findings related to its financial outcome (Greenfield and Braithwaite, 2008). This lack of knowledge in this field is probably due to the complexity of the external assessment systems. Most of the time these systems permeate the entire hospital organization, and therefore, it is hard to tell where the cost and benefits begin and where they end. But there are initiatives to explore this area more deeply, and hopefully they will be able to develop a robust method to determine if these models are cost-effective or not (Mumford et al., 2013).

The studies which investigated the impact of quality improvement systems and specific programs show consistent positive results in clinical- and cost-effectiveness. However, one should interpret these results cautiously for the following two reasons: (1) It is a well know phenomenon that researches tend to publish only the results which show positive outcomes of an intervention, and journals also tend to accept the publication when there is statistical significant connection with a 95% confidential interval. Because of these, sometimes well executed studies are ignored and remain on the shelf of the researchers (Dickersin, 1997). (2) Quality improvement programs are not automated methods. They can only unfold their maximum potential if the management dedicates time, effort, and resources into the program, gives incentives to the workers to participate in this endeavor and completes all stages of the process.

Conclusion

Overall, it is highly recommended that health policy-makers should consider both external quality assessment models and quality improvement systems as valid tools to improve the quality of hospital care. However, it is ill-advised to force these methods on the hospital managers, because it will create a situation where these systems will exist only on paper, and will not be integrated into the everyday practice. Hospital managers should explore and try out different models and strategies to find out which of them suit their need according to the hospital's characteristics and the national health policy environment.

Relating to further studies, more outcome oriented, high sample studies should be carried out in order to compare one technique with another, to find out if they could be implemented simultaneously, to understand how and why

they work, and to find a way to improve these, so that they can become more clinical- and cost-effective tools.

Epilogue: Implications for Hungary

Although Hungary did not participate in any international research project mentioned in this article, the adaptation of the experiences from these studies is essential to implement the most appropriate quality, strategy and methods that support the goals of the Hungarian policy-makers and managers. In Hungary healthcare finance has decreased in proportion to the GDP resulting in the deterioration of health status (KSH, 2014). Since the healthcare finance is not expected to increase in the upcoming years, it is an especially important question which quality strategy is the best to prevent further deterioration of the health of the Hungarian population. Specific answers are needed like the way in which the new Hungarian accreditation quality model should be implemented or how we can modify the already existing ISO and other integrated management systems (the combination of ISO certification and Hungarian Health Care Standards certification) in hospitals in order to improve the quality commitment of the staff, the clinical effectiveness, evidence-based practice, clinical audit and to ensure patient safety and the most important issue to achieve the best health gain from the available limited resources.

References

- Aiken A. M., Wanyoro A. K., Mwangi J., Juma F., Mugoya I. K., Scott J. A. 2013. Changing use of surgical antibiotic prophylaxis in Thika Hospital, Kenya: a quality improvement intervention with an interrupted time series design. *PLoS One*, 8(11):e78942. doi: 10.1371/journal.pone.0078942.
- Alizon F., Shooter S. B., Simpson T. W. 2009. Henry Ford and the Model T: lessons for product platforming and mass customization. *Design Studies*, 30(5):588-605.
- Bloch H. 1988. Medicine and science in the 19th and 20th centuries. *Journal of the National Medical Association*, 80(2): 229-232.
- Bohigas L., Heaton C. 2000. Methods for external evaluation of health care institutions. *International Journal for Quality in Health Care*, 12(3):231-238.
- Bowie P., Bradley N. A., Rushmer R. 2010. Clinical audit and quality improvement - time for a rethink?, *Journal of evaluation in clinical practice*, 18(1):42-8.
- Chernew M. E., Hirth R. A., Sonnad S. S., Ermann R., Fendrick A. M. 1998. Managed care, medical technology, and health care cost growth: a review of the evidence. *Medical care research and review: MCRR*, 55(3):259-88.
- Dickersin K. 1997. How important is publication bias? A synthesis of available data. *AIDS education and prevention : official publication of the International Society for AIDS Education*. Feb;9(1 Suppl):15-21.
- Esteban E., Ferrer R., Urrea M., Suarez D., Rozas L., Balaguer M., Palomeque A., Jordan I. 2013. The impact of a quality improvement intervention to reduce nosocomial infections in a PICU. *Pediatric critical care medicine*, 14(5):525-32.

- European Foundation for Quality Management 1999. Eight Essentials of Excellence – The Fundamental Concepts and their Benefits, *Brussels: EFQM Representative Office Brussels*.
- Greenfield D., Braithwaite J. 2008. Health sector accreditation research: a systematic review. *International Journal for Quality in Health Care*, 20(3):172-83.
- Groene O., Mora N., Thompson A., Saez M., Casas M., Suñol R. 2011. Is the maturity of hospitals' quality improvement systems associated with measures of quality and patient safety? *BMC health services research*, 11:344.
- Heaton C. 2000. "External peer review in Europe: an overview from the ExPeRT Project, *International Journal for Quality in Health Care*, 12(3):177-182.
- Heidemann E. G. 2000. Moving to global standards for accreditation processes: ExPeRT Project in large context. *International Journal for Quality in Health Care*, 12(3):227-230.
- Hinchcliff R., Greenfield D., Moldovan M., Westbrook J. I., Pawsey M., Mumford V., Braithwaite J. 2012. Narrative synthesis of health service accreditation literature. *BMJ quality and safety*, 21:979-991.
- Hopper M. B., Morgan S. 2014. Continuous quality improvement initiative for pressure ulcer prevention. *Journal of wound, ostomy, and continence nursing*, 41(2):178-80.
- KSH – Központi Statisztikai Hivatal 2014., *Statisztikai Tükör*, 7(98):1-4.
- Lombarts M. J., Rupp I., Vallejo P., Klazinga N. S., Suñol R. 2009. Differentiating between hospitals according to the "maturity" of quality improvement systems: a new classification scheme in a sample of European hospitals. *Quality & safety in health care*, 18 Suppl 1:i38-43. doi: 10.1136/qshc.2008.02938.
- Mosby's Medical Dictionary, 8th edition. 2009. Elsevier.
- Mumford V., Greenfield D., Hinchcliff R., Moldovan M., Forde K., Westbrook J. I., Braithwaite J. 2013. Economic evaluation of Australian acute care accreditation (ACCREDIT-CBA (Acute)): study protocol for a mixed-method research project. *BMJ open*, 3:e002381 doi:10.1136/bmjopen-2012-002381.
- Nausheen S., Hammad R., Khan A. 2013. Rational use of antibiotics--a quality improvement initiative in hospital setting, *The Journal of the Pakistan Medical Association*, 63(1):60-4.
- NICE/CHI 2002. Principles for Best Practice in Clinical Audit.
- Paul B. B., Frank D. 2007. What is "quality improvement" and how can it transform healthcare? *Quality and Safety in Health Care*, 16:2-3.
- Schneider E. L., Guralnik J. M. 1990. The aging of America. Impact on health care costs. *JAMA*, 263(17):2335-2340
- Scrivens E. 1995. Accreditation, Protecting the Professional or the Consumer? *Oxford: Oxford University Press*.
- Shaw C., Groene O., Mora N., Suñol R. 2010. Accreditation and ISO certification: do they explain differences in quality management in European hospitals? *International Journal for Quality in Health Care*, 22(6):445-451.
- Shaw C., Groene O., Botje D., Suñol R., Kutryba B., Klazinga N., Bruneau C., Hammer A., Wang A., Arah O. A., Wagner C. 2014. The effect of certification and accreditation on quality management in 4 clinical services in 73 European hospitals. *International Journal for Quality in Health Care*, 2014 Mar 9. [Epub ahead of print].
- Suñol R., Vallejo P., Thompson A., Lombarts M. J., Shaw C. D., Klazinga N. 2009. Impact of quality strategies on hospital outputs. *Quality & safety in health care*, 18 Suppl 1:i62-8. doi: 10.1136/qshc.2008.029439.

The Economist Intelligence Unit: The future of health care in Europe, 2011.