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The development of quality systems in Dutch hospitals between 1995 and 2011

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Abstract

This chapter describes the development of quality systems in Dutch hospitals between 1995 and 2011. Research using longitudinal questionnaire surveys among all Dutch hospitals in 1995, 2000, 2005, 2007 and 2011 measured how the quality systems have progressed. In 1995, 52% of the hospitals taking part were still in the preparation stage of their quality system development, whereas 53% of participating hospitals had all the requisite components of a quality system by 2011. By 2011, 45% of the hospitals had also succeeded in integrating these elements into a system for continuous quality improvement, meaning that the highest level of quality system development had been achieved. If the development of quality systems is examined in terms of the separate quality system components, it can be seen that this development did not progress in the same way for all elements. It is also possible to see that quality systems at larger hospitals have developed further. Future research should focus on additional explanations of differences between hospitals in the development stages of their quality systems and the effects that these systems have on the quality of care.

Introduction

This chapter describes the development of quality systems in Dutch hospitals between 1995 and 2011.

The Care Institutions Quality Act came into effect in the Netherlands in 1996.¹ This act requires all care institutions to monitor, control and improve their own quality. The act imposes four requirements on care institutions: they must be responsible in their provision of care, their policy must be oriented towards quality, they must implement a quality system and must draw up an annual quality report.² In response to these requirements, care institutions started setting up and implementing quality systems. These quality systems focused on monitoring care processes and preventing unintentional harm as the result of medical actions by putting the right preconditions in place for improving the quality of care.^{3,4}

The implementation of quality systems in all care sectors was first mapped out in 1995, followed by another measurement in 2000.^{3,6} Comparison of the results from these two measurements showed that development was not progressing as had been hoped. One of the measures that was taken at that point to speed up development was a nationwide action programme for hospitals under the name *Sneller Beter (Better Faster)*. This action programme was launched on 20 November 2003 as an initiative by the Ministry of Public Health, the Order of Medical Specialists, NVZ (Dutch Hospitals' Association) and V&VN (Dutch Nurses' Association).⁷ The aim of *Sneller Beter* was to use three pillars to encourage improvements in transparency, efficiency and quality: (1) creating quality awareness; (2) developing a national set of indicators for safer and better care, and (3) setting up a Quality, Innovation and Efficiency programme. A total of 24 hospitals took part in this third pillar of *Sneller Beter*. They were split into three groups of 8 hospitals. Each group received support in implementing the programme for two years from a consortium.^{7,9}

During the time the *Sneller Beter* implementation programme was running, several interim evaluations were carried out.^{10,11} The final evaluation followed in 2008. One part of it involved obtaining insights into the effect of the implementation programme on the development of quality systems.^{9,12} To that end, the development of the quality systems was measured in 2005 and 2007 according to the same method that had been used in previous measurements.¹³ This showed that quality systems had continued to develop and that this development was stronger in hospitals where *Sneller Beter* had

been introduced than in hospitals where it had not. However, the development stage of the quality systems of *Sneller Beter* hospitals was not significantly higher than in the other (non-participating) hospitals.^{9,12,14}

The Dutch Hospital Patient Safety Programme was then set up in 2008. This programme was a combination of the implementation of a safety management system and ten evidence-based substantive safety themes.¹⁵ There were two goals to this programme. Firstly, all hospitals had to have an accredited safety management system by the end of 2012. Secondly, all the defined objectives for the ten safety themes had to have been achieved. A safety management system would let hospitals continuously signal risks and carry out improvements; this is seen as embedding patient safety in the organization.¹⁵ There is an ongoing discussion as to whether the effects of safety interventions can in fact be demonstrated in the first place.¹⁶ In the spring of 2013, the final report was issued about the evaluation of the Safety Programme and this was supposed to show whether hospitals had achieved the intended safety objectives.

In this chapter we examine whether the development of quality systems was continued during the timeframe of the Safety Programme. The objective of this study is to determine how far quality systems in Dutch hospitals have developed since the previous measurement in 2007 and how that development relates to earlier measurements from 1995 onwards. The question being studied is:

- *How has the development of quality systems in Dutch hospitals progressed between 1995 and 2011?*

Quality systems

There are various types of quality systems, each with their own interpretation, but one common feature is that they almost always cover the following five domains in some form: policy and strategy, personnel, protocols and procedures, cyclical quality activity, and clients (i.e. patients, in the case of a hospital).^{4,17} Each of these domains covers a number of activities. The level of development or 'maturity' of the quality system can be derived from the extent to which these activities are carried out systematically.

The literature distinguishes four development stages of quality systems.^{4,17-22} First comes Stage 0, 'orientation and awareness'. In this stage of the quality system, little has yet been arranged in concrete terms, but people are starting

to realize more and more that quality and quality assurance are important. The next stage is the 'preparation' phase (Stage 1), in which the first steps towards setting up a quality system are taken. A number of quality improvement activities may already have been cautiously initiated. In Stage 2 ('experimentation and implementation'), the organization has already progressed quite some way in setting up policy, procedures and guidelines relating to quality for all parts of the quality system. However, these elements are not yet integrated into the operational processes. This is the case in the final stage, 'integration' (Stage 3). Here, not only are the quality improvement activities integrated into the working processes and the daily practice, but policy is also systematically adjusted as a result of quality information (a so-called feedback loop). In this stage, there is a cyclical process of continuous quality improvement. This final stage is the ultimate aim of any organization, because it reflects the highest level of development of the quality system and a process of continuous quality improvement is in effect.⁴

Method

To determine the development of quality systems in Dutch hospitals, longitudinal questionnaire-based research was done in the period from 1995 to 2011 among all Dutch hospitals. Measurements were made in 1995, 2000, 2005, 2007 and 2011.

Respondents

Chief executive officers of all Dutch hospitals were approached with a request to complete a written questionnaire about the quality management and safety management of the hospitals at which they worked. If appropriate, the questionnaire could also be completed by the hospital's quality officer or with his/her assistance. There was a space on the questionnaire to indicate who had filled it in. The average response over the years combined is 73%. One explanation for the high response rate is that feedback reports were offered, in which the hospital's own responses were compared with the answers of the overall group of participating hospitals. As a result of several hospitals having merged during the observational period, the number of hospitals that were approached was not the same in all years; the number of hospitals in the Netherlands has decreased over time.

The questionnaire

The questionnaire that was used in this study was developed and validated in 1995.⁴ It contains questions about quality management and safety management in hospitals. Questions were asked within five different domains about quality improvement activities that the hospital had undertaken (see Table 1). The five domains used for this are features that virtually all quality systems have in common: policy and strategy, human resource management protocols and procedures, systematic quality improvement, and patient involvement. The questionnaire was used in the same format at each of the recurring measurement moments. In the policy and strategy domain, the questions asked were about whether the hospital had certain quality documents, such as *a written description of the mission, a written description of the quality policy, or a quality manual*. Respondents could choose to answer the question with 'yes, we have it', 'under development' or 'no'. In the human resource management domain, respondents could say how much their personnel policy was focused on quality policy. An example statement could be *new staff get quality assurance training*. Respondents could place a cross on a five-point agreement scale running from 'None' to 'Extremely', with the last of these representing the desired situation. In the protocols and procedures domain, the questions were about whether particular protocols were present in the organization, for example for *preoperative screening* or *infection prevention*. In the systematic quality improvement domain, respondents could indicate whether particular activities took place in their hospital and whether the results of those activities were demonstrably used (cyclical) to adjust policy. Examples of systematic quality activities are *incident analysis* and *internal inspections*. Finally, there was the patients domain. Here, respondents were asked to what extent patients and/or their interest groups were involved in certain quality activities such as *developing quality criteria* or *patient satisfaction surveys*.^{4,17,23} The division into stages is cumulative, i.e. hospitals enter a given phase when they are carrying out at least one of the activities from that stage and are carrying out virtually all the activities of the underlying stages. In addition, this subdivision assumes that any hospital is in principle capable of reaching the highest level.

Table 1 Quality improvement activities broken down into five categories and four development stages

	Policy and strategy	Human resource management	Protocols and procedures	Systematic quality improvement	Patient participation
	<i>Does your hospital have the following documents?</i>	<i>How much does your personnel policy focus on quality policy?</i>	<i>What protocols are used?</i>	<i>Do the following activities take place in your hospital? If so, are the results demonstrably used for adjusting the policy?</i>	<i>Which quality activities involve patients and/or organizations representing their interests?</i>
Stage 0: Orientation and awareness	<ul style="list-style-type: none"> - mission - product description 	<ul style="list-style-type: none"> - encouraging professional development 	protocols for: <ul style="list-style-type: none"> - specific treatment 	<ul style="list-style-type: none"> - peer review - care plans 	<ul style="list-style-type: none"> - patients are not involved
Stage 1: Preparation	<ul style="list-style-type: none"> - quality policy - institutional quality working plan - annual quality report 	<ul style="list-style-type: none"> - training for the managers - training for the staff - involvement in quality activities during working hours - indicated by the board 	<ul style="list-style-type: none"> - patient information - diagnostic related groups - reserved treatments - medical aids 	<ul style="list-style-type: none"> - committees - complaints registration - clients' council - job assessment interviews 	<ul style="list-style-type: none"> - patients are involved in: - discussing results - evaluating whether goals have been achieved

Table 1 Quality improvement activities broken down into five categories and four development stages (*Continued*)

	Policy and strategy	Human resource management	Protocols and procedures	Systematic quality improvement	Patient participation
	<i>Does your hospital have the following documents?</i>	<i>How much does your personnel policy focus on quality policy?</i>	<i>What protocols are used?</i>	<i>Do the following activities take place in your hospital? If so, are the results demonstrably used for adjusting the policy?</i>	<i>Which quality activities involve patients and/or organizations representing their interests?</i>
Stage 2: Experimentation and implementation	<ul style="list-style-type: none"> - quality working plan for some departments - quality working plan for all departments 	<ul style="list-style-type: none"> - management controls - monitored by the board - new staff selected on quality attitude 	<ul style="list-style-type: none"> - cooperation with other providers 	<ul style="list-style-type: none"> - satisfaction surveys - research into needs - management information system - accreditation 	<ul style="list-style-type: none"> - development of quality protocols or guidelines - development of criteria
Stage 3: Integration	<ul style="list-style-type: none"> - quality manual - institutional quality working plan 	<ul style="list-style-type: none"> - systematic selection and training depending on the priorities in the quality policy 	<ul style="list-style-type: none"> - patient routing - critical incidents 	<ul style="list-style-type: none"> - internal auditing - systematic satisfaction surveys among patients 	<ul style="list-style-type: none"> - participation in committees or improvement projects

(modified version, Sluijs & Wagner, 2000)

Data collection

Respondents were approached in writing with a request to complete the questionnaire about quality management and safety management. The study was explained in an accompanying letter. Reminder letters were sent after two and four weeks. In exchange for their participation, the hospital received a feedback report in which the results of their own hospital were compared against the (anonymised) results of the overall group of hospitals taking part.

Data analysis

The answers to the questionnaire were used for obtaining a picture of quality improvement activities at the hospitals. This was used as the basis for determining the development stage of hospital quality systems. The degree of development represented by each item on the questionnaire was determined and used as the basis for assigning a score that could be used for categorizing the development stage (see Table 1). Descriptive statistics were used to determine how the development of quality systems in hospitals progressed between 1995 and 2011.

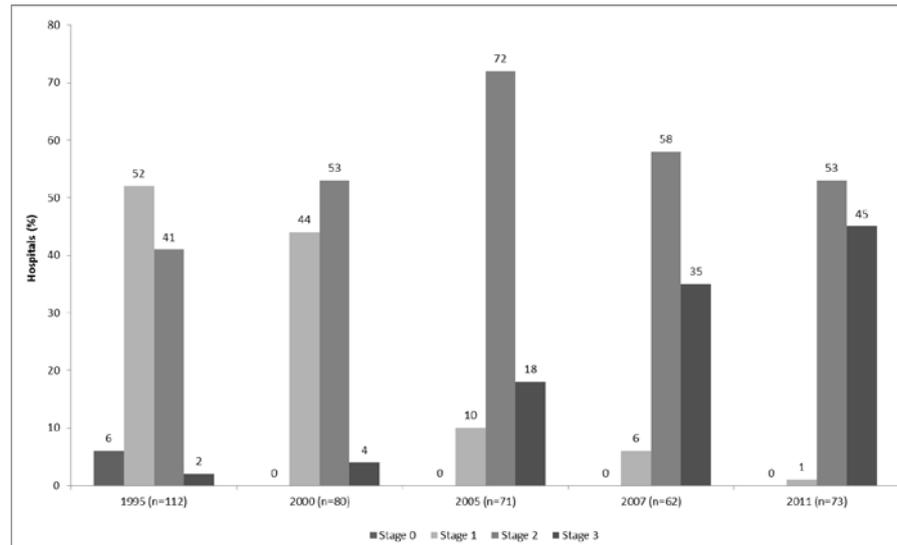
Multi-level analyses were performed in order to determine whether the levels of quality systems had progressed over time. Multi-level analysis was needed because of the hierarchical data structure, which meant that the various measurements from the same hospital were not independent of each other. In addition, another important reason for choosing multi-level analysis was that this technique is able to handle incomplete datasets. The dataset in this study is incomplete because not each hospital participated in the study every year that measurements were made. A multi-level model is able to make allowances for this. Hospitals that merged were handled as follows in the analysis. During the study period, two possible situations could arise: (1) two or more hospitals merged, and in doing so formed one new hospital organization, or (2) a hospital ceased to exist. In the first case, this could result in two hospitals in the dataset with identical numbers, for instance when both hospitals completed the questionnaire for the measurement separately after they had merged. In that case, a new identification number was created for one of the two hospitals. In the second case, the hospital disappears as a unit in the analysis and its identification number will have missing values for the remainder of the study period.

The multi-level analyses also examined whether the development of quality systems varied between larger and smaller hospitals. To do so, the number of reported FTEs (full-time equivalents) for the hospitals was included in the

model as a variable. Because only 54 of the 112 hospitals (48%) from 1995 could be identified, it was decided that the data from 1995 should not be included in the multi-level analyses. These analyses therefore only cover the period from 2000 to 2011 (in the descriptive analyses all measurement years were included). The descriptive analyses were carried out using STATA version 11.0. The multi-level analyses were carried out with MLwiN version 2.24.

Results

Figure 1 The development of quality systems in Dutch hospitals between 1995 and 2011.



Stage 0 = Orientation and awareness; Stage 1 = Preparation; Stage 2 = Experimentation and implementation; Stage 3 = Integration.

Figure 1 shows the development of quality systems between 1995 and 2011, showing that quality systems have kept developing further over the years. By 2011, there were virtually no hospitals any more that were in the lowest two stages of development (Stage 0 and Stage 1). By 2011, 45% of all hospitals had reached the highest stage of development and a further 53% of hospitals were in the penultimate development stage. Those figures were 35% for Stage 3 and 58% for Stage 2 in 2007. The development of quality systems seems at first glance to have slackened off somewhat between 2007 and 2011, but statistical checks showed that this was not statistically significant (the results of this analysis have not been included in the tables).

Table 2 Average score for the development stage of the quality system and average scores for domains of the quality system between 1995 and 2011

Domain	1995 (n=112)			2000 (n=80)			2005 (n=71)			2007 (n=62)			2011 (n=73)		
	Avg	SD	Range	Avg	SD	Range	Avg	SD	Range	Avg	SD	Range	Avg	SD	Range
Policy and strategy	1.53	0.64	0.00-2.00	1.73	0.64	0.00-3.00	2.15	0.47	0.00-3.00	2.40	0.49	2.00-3.00	2.48	0.53	1.00-3.00
Human resource management	1.72	0.84	0.00-3.00	1.30	0.58	1.00-3.00	2.56	0.58	1.00-3.00	2.53	0.53	1.00-3.00	2.67	0.55	1.00-3.00
Protocols and procedures	1.81	0.84	0.00-3.00	2.10	0.67	1.00-3.00	2.30	0.68	1.00-3.00	2.53	0.65	1.00-3.00	2.62	0.59	1.00-3.00
Systematic quality improvement	1.00 ^a	0.00	1.00-1.00	2.05	00.00	0.00-3.00	1.72	0.86	1.00-3.00	00.00	0.97	0.00-3.00	2.39	0.88	1.00-3.00
Patient participation	1.53	1.06	0.00-3.00	1.28	1.23	0.00-3.00	1.62	1.10	0.00-3.00	1.94	1.05	2.00-3.00	1.68	1.03	0.00-3.00
Stage ^b	1.39	0.62	0.00-3.00	1.60	0.56	1.00-3.00	2.08	0.53	1.00-3.00	2.29	0.58	1.00-3.00	2.44	0.53	1.00-3.00

a missing b stage 0 = Orientation and awareness; Stage 1 = Preparation; Stage 2 = Experimentation and implementation; Stage 3 = Integration.

Table 2 shows the average scores of all hospitals for all five quality system domains over the course of the years. This shows again that quality systems kept developing further during the period from 1995 to 2011. In 1995, the average development stage was 1.39 (SD 0.62) and in 2011 it was 2.44 (SD 0.53). If the development for each domain of the quality systems is examined separately, it is noticeable that the progression is not the same in all domains. In particular, the pattern for the patient participation domain is variable. At the last measurement, the average score went down from 1.94 (SD 1.05) in 2007 to 1.68 (SD 1.03) in 2011.

Table 3 Multi-level analysis of the effect of time and type of hospital on the development stage of quality systems between 2000 and 2011

	Model 0 (empty model) n=284	Model 1 (model 0 + time) n=284	Model 2 (model 1 + FTE) n=270
Fixed effects	B coefficient (SE)	B coefficient (SE)	B coefficient (SE)
Development stage of the quality system intercept (constant)	2.084 (0.033)***	1.728 (0.045)***	1.657 (0.051)***
Time (2000-2011)	-	0.064	0.062
FTE (FTE x 1000)	-	(0.006)***	(0.006)***
		-	0.052 (0.017)**
Random effects			
Variance components:			
- hospital (level 2)	0.023 (0.017)	0.039 (0.014)**	0.029 (0.013)*
- moment of measurement (level 1)	0.241 (0.025)***	0.154 (0.016)***	0.158 (0.017)***
-2 log likelihood (IGLS)	425.534 (ref)	328.086	306.727
Deviance test	Reference	P<0.001	P<0.001

* p<0.05, ** p<0.01, *** p<0.001

Table 3 shows the results of the multi-level analyses. The first column contains the baseline model and shows the average development stage. The random effects show significant differences between the measurement moments. In model 1, time has been included and reduces the variance between the measurement moments and the variance between hospitals has become statistically significant. The deviance test shows that model 1 fits the

data significantly better than model 0 ($p < 0.001$). This means that the differences in development stages over time are not caused by differences in the composition of the group of hospitals taking part over the years. Instead, over time the development stage advanced. The third column shows the results of model 2, in which the number of FTEs has been added as a variable. This variable shows the effect of hospital size (expressed in FTEs). The deviance test shows that model 2 fits the data significantly better than model 1 ($p < 0.001$). This means that larger hospitals are at a more advanced stage of development.

Discussion

The aim of this study was to obtain insight in how the development of quality systems in Dutch hospitals progressed between 1995 and 2011. The results of this study show that there has been growth in the development stages of quality systems at hospitals from the initial measurement in 1995 onwards, and that this growth continued until to the last measurement in 2011. If this development is split up into the various quality system domains, it becomes clear that the development did not progress in the same way in all domains. One striking finding in this respect is the recurrent drop in the patient participation domain. Patient participation has developed strongly over recent decades; it is seen as a way of improving the quality of care.²⁴ A wide range of methods are used for patient participation, such as focus groups, mirror interviews, participation in patients' councils and working groups. The high level of institutionalization of participation, plus proto-professionalization of patients, presents problems that make it difficult to convert patient participation into a genuine contribution to the quality of care.²⁵ The effects of participation are therefore also insufficiently proven, so there is some reluctance on the part of hospitals and authorities to encourage participation.²⁵ In addition, there is another issue in the specific case of participation in the development of guidelines. Guidelines in the care sector are largely derived from evidence-based medicine (EBM) and there is a gap between EBM and patients' experiences.²⁵ There is a risk that experiences may not be included in the final guideline at all because it can be difficult to integrate patients' experiences with EBM.²⁵ The above could be a possible explanation for the scores observed in the patients domain.

The analyses have also shown that the quality systems of larger hospitals are further developed. This is consistent with research that makes the case for increased scale in the care sector in order to improve quality.²⁶⁻²⁹ It is however

unclear what the effects of hospital mergers are and it has not yet been demonstrated convincingly enough that mergers do lead to improved quality of care.²⁶⁻²⁹ The number of hospitals in the Netherlands went down from 143 in 1995 to 92 in 2012. This drop is primarily the consequence of mergers that have resulted in larger hospital organizations. The results of this study contribute to the discussion about the effects of increasing scale; they seem to suggest the increasing scale does indeed have a positive effect on quality as systems or continuous quality improvement are then better developed.

In general, the results of this study suggest that hospitals should continue to invest in all the individual domains of the quality system, even if a high level has already been attained. If this is not done, parts of the quality system may then regress to lower development stages. In addition, it transpires that it is difficult to reach the highest level of quality system development, in which quality improvement is integrated into the day-to-day working processes and policy is systematically adjusted. That can be concluded from the fact that more than half (53%) of the hospitals taking part have not yet reached the highest stage of development. These hospitals do have all the requisite elements of a quality system, but the various parts are not yet integrated to create a system of continuous quality improvement.

The results of the present study can be compared against European research into the implementation of quality systems. One of the first large-scale European projects was ExPeRT, in which the strengths of ISO, EFQM, peer review and accreditation were examined.³⁰ The ENQual network was then set up as a European cooperative project that emphasized exchange of knowledge relating to quality management. A questionnaire was developed in ENQual that can be used for quantifying quality management at hospitals.³¹ The MARQuIS project was the first to investigate the added value of various quality improvement strategies used in European hospitals.³¹ The results showed that there were hospitals in all the participating countries that did have quality systems that were well advanced, but that there were large differences both within countries and between countries. The variation within countries was actually almost as large as the variation between countries.^{31,32}

Limitations of the study

One of the possible limitations of this study is the self-reporting by chief executive officers and quality officers. It is in the hospitals' own interest to present themselves favorably, particularly in times such as these when increasingly stringent requirements are being imposed and more and more data is being made public because of transparency obligations. On top of that, there may have been changes at any given hospital within the Board of Directors or of quality officials, meaning that the answers from any one hospital over the years may not always have been provided by the same person. However, the wide range of scores, the general tendency of a shift to higher stages, the anonymity of the respondent and the provision of feedback reports for benchmarking do seem to suggest that the questionnaires were filled in honestly. A second limitation is that the questionnaire gives a picture of the hospital as a whole, without providing any insights into differences between and/or within departments or parts of the hospital. The possibility of such differences should be taken into account when interpreting the results.

Future research

Future research should focus on an explanation of differences between hospitals in the development stage of their quality systems. What factors or conditions contribute to an advanced stage, and can hospitals exert any influence on this themselves? Possible explanations can be sought in organizational characteristics such as the complexity (e.g. differences between general, academic, clinical and specialist hospitals) or whether they have recently been through a merger. As discussed earlier, it has not been demonstrated that scale increases will achieve the intended effects. The relatively limited statistical power of the current study meant that it was not possible to include further variables in the analyses.

In addition to investigations into possible causes of differences between hospitals in the structure of their quality systems, it is also important to pay attention to the effects that these systems have on the quality of care. A quality system is after all intended to guarantee and improve the quality of care: it is seen as a precondition for guaranteeing and improving patient outcomes. However, little or no research has been done into the effects of quality systems. Research that has been carried out is often based on small samples, or focuses on a single measure of outcome or a single organization.³³ Weiner et al.³³ were one of the first to find a relationship between the number of physicians participating in quality improvement teams and two measures of patient safety: the number of post-operative

complications and the number of technical problems with procedures. Groene et al.³² found a relationship between the 'maturity' of a quality system and a lower number of hospital complications. The European DUQuE (Deepening our Understanding of Quality Improvement in Europe) research project is currently looking at the relationship between quality systems and the quality of care in European hospitals.³⁴ The results of that project are expected. Future research must fit in with this and should focus on the relationship between quality systems and care outcomes.

Conclusion

The development of quality systems in Dutch hospitals between 1995 and 2011 shows that they are progressing: almost half of the hospitals had reached the cyclical stage of quality improvement by 2011. However, attaining this highest stage in which the quality system is integrated into the day-to-day working processes and in which quality is embedded in the organization seems to be a difficult final step for the remaining half of hospitals. These hospitals do have all the components of the quality system, but have not yet managed to integrate them into a system in which quality information is used in a systematic feedback loop to adjust policy.

References

1. Kwaliteitswet Zorginstellingen. Nederland, 1996.
2. Inspectie voor de Gezondheidszorg, www.igz.nl
3. Wagner C, de Bakker DH, Sluijs EM. Kwaliteitssystemen in instellingen: de stand van zaken in 1995. Utrecht: NIVEL, 1995.
4. Wagner C. Implementation and effectiveness of quality systems in health care organizations. Utrecht: NIVEL 1999.
5. Sluijs EM, Wagner C. Kwaliteitssystemen in de zorgsector in 2000. Utrecht: NIVEL 2000.
6. Sluijs EM, Wagner C. Progress in the implementation of quality management in Dutch health care: 1995-2000. *Int J Qual Health Care* 2003; 15: 223-234.
7. Consortium Sneller Beter pijler 3. Landelijk plan van aanpak Sneller Beter pijler 3. Utrecht/Rotterdam/Utrecht: CBO Kwaliteitsinstituut voor de Gezondheidszorg, Instituut Beleid & Management Gezondheidszorg, Orde van Medisch Specialisten, 2004.
8. Dückers M, Wagner C. Ex ante evaluatie Sneller Beter pijler 3: inventarisatie van de mate waarin de opzet van het programma Sneller Beter pijler 3 voldoet aan eisen ontleend aan literatuur. Utrecht: NIVEL, 2005
9. Dückers M. Changing Hospital Care. Evaluation of a multi-layered organisational development and quality improvement programme. Utrecht: NIVEL 2009.
10. Dückers M, de Bruijn M, Wagner C. Evaluatie Sneller Beter pijler 3: de implementatie van verbeterprojecten in de eerste acht ziekenhuizen: Utrecht: NIVEL, 2006.
11. Dückers M, Wagner C. Evaluatie Sneller Beter pijler 3: het interne vliegwiel. De stand van zaken in de eerste ziekenhuizen na twee jaar deelname. Utrecht: NIVEL, 2007.
12. Vos L, Dückers M, Wagner C. Evaluatie Sneller Beter pijler 3: resultaten van een verbeterprogramma voor ziekenhuizen. Utrecht: NIVEL 2008.
13. Sluijs E, Keijser A, Wagner C. Kwaliteitssystemen in zorginstellingen: de stand van zaken in 2005. Utrecht: NIVEL, 2006.
14. Dückers M, Makai P, Vos L, Groenewegen P, Wagner C. Longitudinal analysis on the development of hospital quality management systems in the Netherlands. *International Journal for Quality in Health Care* 2009; 5:330-340.
15. VMS Veiligheidsprogramma, www.vmszorg.nl
16. Zegers M, Wollersheim H. Landelijk veiligheidsprogramma leidt niet tot halvering van vermijdbare sterfte in ziekenhuizen. *Nederlands Tijdschrift voor Geneeskunde* 2012; 156:A4768.

17. Wagner C, Bakker, de DH, Groenewegen PP. A measuring instrument for evaluation of quality systems. *International Journal for Quality in Health Care* 1999; 2: 119-130.
18. Crosby PB. *Quality is free: the art of making quality certain*. New York: McGraw-Hill 1997.
19. Hardjono TW, Hes FW. *The Dutch Quality Award*. Deventer: Kluwer 1993.
20. Rogers EM. *Diffucion of Innovations*. New York: The Free Press 1983.
21. Hage J, Aiken M. *Social change in complex organizations*. Alphen aan den Rijn: Samsom publisher 1980.
22. Mann FC, Neff FW. *Managing major change in organizations*. Ann Arbor, Michigan: Foundation for research on human behaviour 1961.
23. Wagner C, Coppen R, Poortvliet MC. *Quality and safety management in hospitals (QSMH): survey manual of the QSMH*. Utrecht: NIVEL 2006.
24. Bovenkamp HM, Grit, van de K, Bal R. *Zaakwaarnemenrs van de patiënt*. Rotterdam: iBMG ErasmusMC 2008.
25. Bovenkamp HM, Grit, van de K, Bal R. *Inventariatie patientenparticipatie in onderzoek, kwaliteit en beleid*. Rotterdam: iBMG ErasmusMc 2008.
26. Zuiderent-Tjerak T, Kool T, Rademakers J. *De relatie tussen volume en kwaliteit van zorg- Tijd voor een brede benadering*. Utrecht/Nijmegen/Rotterdam: Consortium Onderzoek Kwaliteit van Zorg 2012.
27. *Medisch- Specialistische Zorg in 20/20- Dichtbij en ver weg*. Den Haag: Raad voor de Volksgezondheid en Zorg 2011.
28. Mutter R, Wong H. *The Effects of Hospital Competition on Inpatient Quality of Care*. Agency for Health Care Research and Quality 2004.
29. Sari N. *Do Competition and Managed Care Improve Quality?*. *Health Economics* 2002; vol. 11, no. 7.
30. Shaw C. *External quality mechanisms for health care: summary of the ExPeRT project on visitatie, accreditation, EFQM and ISO assessment in European Union countries*. *International Journal for Quality in Health Care* 2000, 3: 169-175.
31. Lombarts MJMH, Rupp I, Vallejo P, Klazinga NS, Suñol R. *Differentiating between hospitals according tot the “maturity” of quality improvement systems: a new classification scheme in a sample of European hospitals*. *Quality and Safety in Health Care* 2009, 18: 38-43.
32. Groene O, Mora N, ThompsonA, Saez M, Casa M, Suñol R. *Is the maturity of hospitals’ quality improvement systems associated with measures of quality and patient safety?*. *BMC Health Services Research* 2011, 11:344.
33. Weiner BJ, Alexander JA, Baker LC, Shortell SM, Becker M. *Quality Improvement Implementation and Hospital Performance on Patient Safety Indicators*. *Medical Care Research and Review* 2006, 63:29.

34. Groene O, Klazinga N, Wagner C, Arah OA, Thompson A, Bruneau C, Suñol R. Investigating organizational quality improvement systems, patient empowerment, organizational culture, professional involvement and the quality of care in European hospitals: the 'Deepening our Understanding of Quality Improvement in Europe (DUQuE)' project. *BMC Health Services Research* 2010, 10:281.

