

Maatschappij en de Elektronische Snelweg

Changing networks of care: Professionals, professions and the rise of ICT in health care

Report NWO-MES project 014-43-708

**Dr. Roland Bal en Prof. dr. Marc Berg
Instituut Beleid en Management Gezondheidszorg, Erasmus MC**

Introduction

Information- and communication technology (ICT) will have great impact on the practice of health care in the years to come. Creating structured and standardized electronic patient records (EPRs), and connecting different health care sites through high speed communication links, it is hoped, will put an end to current, messy record keeping practices and facilitate coordination between health care providers. In this way, ICT could enhance the quality and efficiency of the care process, improve working standards of health care professionals and facilitate data retrieval for management, research and policy purposes. Through Internet-based technologies, in addition, patients will gain access to their medical information, and search the Web for information on their afflictions and health care providers (1, 2).

The research project presented here aims to investigate the consequences of these new technologies for the health care professional. Earlier research, by our group and others, has already started to chart some of the fundamental changes in the social organization of health care practices when ICT applications such as EPRs are introduced (3-9). Work practices change, responsibilities are redistributed and new modes of communication emerge between professionals and between professionals and patients.

Following recent developments in science and technology-studies, information systems research and in organizational science, we do not argue that the social organization of health care work is determined by technological developments. Yet technologies do *mediate* organizational developments, ascribing roles to some actors and not to others (10-12). One way in which this mediation occurs is the *inscription* of roles in technologies, such as ICT application, making some action more probable than others (13). Some EPR systems, for example, are more 'general practitioner friendly' than others; some will not empower the patient but rather disempower him or her. If this is the case, it becomes crucial to closely investigate the emergence of these technologies, especially since the future form of the ICT health

care infrastructure has not yet crystallized. An early discussion of different possible futures will help those actors that are affected by these futures to better prepare themselves, or to develop a more adequate ICT policy and strategy. Through a more thorough and more public scrutiny of the 'scripts' embedded in these technologies, in other words, we can at least try to reduce the chances that ICT applications will emerge that will affect patients, professionals and health care organizations in undesirable ways. Ultimately, this research also hopes to contribute to the construction of ICT applications that embed values held important by their primary users (both health professionals and patients), and whose functioning strengthens rather than threatens their position in the health care network (10, 14-16).

Research questions and methods

As true 'knowledge workers', Western health care professionals have many reasons to both welcome and fear ICT. Some authors argue that ICT holds the promise to enhance their professional grip on their work, to better oversee patient trajectories, to optimize coordination of work tasks and to enhance their opportunities to follow and participate in clinical research. Such changes, added with a better grasp on the information flows in and out of their work sites might enhance the overall status of the profession involved (17). Other authors are more pessimistic: the introduction of ICT, they argue, will necessarily demand standardization of work tasks into increasingly rigid hierarchies, accompanied by an increase in administrative chores, and a loss of individual jurisdiction to determine one's own professional decisions. In this view, ICT could ultimately lead to deprofessionalization (9). Other authors, still, would argue that we will not so much witness processes of deprofessionalization for the professions as a whole, but a process of stratification *within* professions, between 'rank-and-file' professionals, whose work is further and further standardized and controlled, and 'elite' professionals, who control the standardization and set the control-criteria. In the latter case, the status of the profession as a whole might remain unaffected, yet the changes *within* the profession would be quite substantial (18). These changes, finally, might affect different professions (or individuals within these professions) in different ways: those professions and professionals who are already heavily invested in modern technology, for example, or who are in a strong financial position or already strongly in control of their own work tasks might gain much more from the emergence of this new technology than others (19).

Whichever future will become true, it seems clear that ICT will stimulate the already existing trend towards increased, protocol-driven cooperation across professional boundaries. In addition to changing the position of professions, or of individual professionals within professions, then, the relations and boundaries *between* professions are also affected by the introduction of ICT (20). The development and

implementation of such applications raises questions as to where one profession's job description ends, and where another's begins? Where are data going to be accumulated, who will be in charge of these data, and who will supply them? Nurses, for example, hope that the introduction of ICT will enhance their position as a profession of scientific knowledge workers vis-à-vis the medical professions. Yet in many actual instances where applications are introduced for both physicians and nurses, it is often the former group that attempts to delegate any increase in administrative chores or registration responsibilities to the latter (21, 22). Specific ICT implementations, then, may help to enhance or to limit the jurisdiction of some professions, and thus strengthen or weaken that profession's position vis-à-vis others.

It is important to study the way ICT affects the content of the work of health care professionals. Rather than looking at formal description of ICT applications, or at the discourse surrounding them—albeit important in their own right—the research described here takes as its starting point the actual working practices of healthcare workers (defined broadly as those occupations that play a role in the patient care trajectory). Following Abbott (20) the actual sites in which work is performed can be seen as one of the crucial sites in which professional relations are shaped. Moreover, it is here that technologies such as ICTs play a predominant role. Although formal work descriptions—even those embedded within information technologies—are important, actual work practices can deviate from those formal descriptions. For example, in a study on work relations in medication ordering, it was found that whereas officially doctors would be doing the ordering and this official procedure was inscribed into the information technology, in practice it were the nurses who did most of the work concerning medication ordering. As the technology was build around the official version of work relations in medication ordering, this obstructed actual working practices (23). Also, strengthened by the emergence of Internet health sites, professionals will encounter ever-increasingly 'knowledgeable' patients, and find themselves in an ever-decreasing monopoly on expert knowledge. How will this affect their tasks, and their relationships with their patients? In addition, these same developments (the explosion of Internet-based medical sites) may also affect the work of e.g. physicians through changing *their* patterns of knowledge acquisition, and through involving physicians more thoroughly in processes of knowledge-generation through e.g. using their electronic patient data in collaborative research projects.

The exploratory central research question of this project, then, is: *how does the rise of ICT in health care affect the position of health care professionals and their professions?* This overall question is specified in the following sub questions:

- *How will the content of the health care professional's work change through the emergence of ICT in the health care process?*

How will the work tasks of individual professionals change

through their interaction with ICT applications? Will the standardization of work tasks be 'compensated' by the emergence of novel responsibilities and tasks, afforded by the ICT (24, 25)? Will they become 'information brokers' rather than information providers?

- *How will professions as a whole be transformed through ICT?*
How will the increasing interdependencies between professionals affect the hierarchies and task-divisions between and within professions? What will be the most prevalent embedded 'script' in these applications regarding the relations between and within health care professions? Which professions will become 'successful' in their ICT strategy, and which will be less successful? What will these ICT strategies consist of? What could be the success factors for 'successful professionalization' drawing upon ICT? Will the heuristic insight that the introduction of ICT usually strengthens already existing power-relations be replicated in this area as well?
- *Given the current configuration of actors in the network shaping ICT development, how can we explain the trends observed?*
What are the drivers behind the varying trends observed? How can we explain (in the sense of making an empirically informed argument) varying 'results' of the ICT strategies of professions, and the prevalence of some embedded scripts over others?

Furthermore, as this project is also concerned with the ways in which ICT can strengthen professional relations, it aims at looking at models in which professional interaction is indeed strengthened by ICT instead of hampered, as is so often the case.

The research that is reported here is predominantly based on qualitative case research. Three cases were studied: (1) two telemedicine applications in eye care, dealing with case identification of glaucoma (the 'transmural glaucoma project' in Rotterdam) and with identification of retinopathy (the Zwolle diabetes project), (2) an application aimed at optimizing the general practitioner – medical specialist relationship by standardizing referral and discharge letters ('ZorgDomein' as applied in the region of Southeast Brabant), and (3) a standard aimed at making available medication information between pharmacists (the so-called 'OZIS' standard —Open Zorg Informatie Standaard). The cases studies share a focus on interprofessional relations in healthcare as embedded within 'integrated care' (in the Dutch context often referred to as 'transmural care'). This area was chosen because of the large emphasis within both international and Dutch healthcare policies on interaction between healthcare organizations, in order to increase both efficiency and quality of care (26, 27). In all three cases, the relations between different (kinds of) professions are at stake. The first case, focusing on eye care, consists of two projects: one, the Transmural Glaucoma Project, was set up by the Rotterdam eye hospital. Within the project, besides

ophthalmologists, a large role was played by optometrists, who are normally seen to be outside the bounds of healthcare (i.e. working in private eye shops), but who were through the project assigned a role in the early identification of glaucoma patients. The second project is concerned with the early identification of retinopathy in diabetes patients, and was set up as a collaboration between ophthalmologists and diabetes nurses, that last of which were given the role of making pictures of patient's eyes to enable checking on retinopathy. In the second case, ZorgDomein, collaboration focused on general practitioners and medical specialists. The third case, the OZIS standard, predominantly focused on pharmacists. However, use of the standard was seen as a first step in enhancing collaboration between all parties dealing with medication, i.e. public pharmacists, general practitioners, medical specialists and hospital pharmacists.

Whereas the first two cases focused on the changing working practices of professionals and changing interprofessional relations as a result of the introduction of information technologies, the third (OZIS) case focused on the possibilities for IT development in a context of divergent professional interests. The eye care and referral cases thus share a focus on changes at the micro level of interprofessional collaborations, whereas the OZIS case is mainly concerned with meso and macro level changes that facilitate (or hamper) IT development and implementation.

For the micro-level cases, use is made of a model of health care work developed by our group (28, 29). This model takes as a starting point the standardized patient care trajectory, moving away from the standardization of trajectories of individual patients or of the process of decision making by individual specialists (as is the case in medical guidelines). Rather than trying to standardize processes that have been shown extremely complex, dynamic and unpredictable (30, 31), standardization is focused on an *aggregated level*, i.e. at the level of *patient groups*. On this level it turns out that trajectories display substantial similarities. Whereas individual patient trajectories are inherently unpredictable, the trajectory for groups of patients can be *made* predictable and care can be organized accordingly. Even if certain steps cannot be planned for specific patients due to the variability of individual care trajectories (for example finding a suspicion on breast cancer in primary care), it is possible to assess for a group of patients how often a particular step will occur and make sure the organization is ready to meet this demand (for example by keeping emergency slots available for a quick diagnosis of breast cancer in the hospital). These capacities can then be assigned on a last minute basis to individual patients.

In this approach, developing standardized care trajectories is interrelated with four domains, being re-delegating tasks, integrated planning, performance management and process-supporting ICT (see figure 1). These domains are to some extent the 'usual suspects' in standardization initiatives. Re-delegating tasks is for example one of the classical promises of "manualized" treatment (32). In this line of

reasoning, treatment is standardized first and the re-delegation of tasks that carried out afterwards as a way to implement and maximize the results of the clinical guideline. When situating standardization, re-delegating tasks is part of the process of standardization itself: those aspects where re-delegation seems professionally feasible shape the form of the standardized care trajectory.

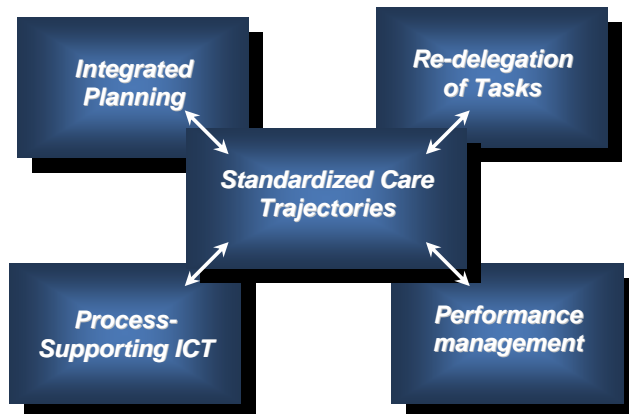


Figure 1: Domains of situated standardization

Similarly, performance management, rather than being the usual norm-setting activity of defining what the optimal medical care is at a distance from care delivery and deciding which indicators should be used to manage the treatment of particular groups of patients, in this model of situated standardization is co-constructed with the standardized care trajectories for a particular care setting and interwoven with management information and common management practices. Integrated planning may be seen as the rationalization of the steps patients go through that is then implemented through organizational changes. Which parts of the care trajectories are planned integrally however, is a matter of organizational opportunities, including existing resources and capacities and including existing interprofessional relations. Finally, process-supporting ICT is of course often seen as the ultimate tool for the coordination of highly complex standardized care processes. However, in this approach of situated standardization, rather than developing over-arching ICT applications which coordinate entire care trajectories – and running into ‘implementation problems’ at a later stage – major gains can be realized by aligning existing modules of the information systems in use with the aims of solving persistent problems.

When focusing on the way these five domains are intertwined, the standardized care trajectories are no longer the *point of departure* for an organizational change and implementation phase that follows the design phase. They are the *outcome* of the project as a whole.

All cases were studied using qualitative research techniques: document analysis, interviews and (participant or non-participant) observations.

Qualitative techniques were used as these allow for an analysis of ongoing dynamic transformations of professional relations in working practices. Moreover, as one of the objectives was to study the relations between the formal representations of work practices—either in discourse or materially embedded within information technologies—and the emergence of work practices as a result of the interaction between the formal representations and the actual accomplishment of tasks, qualitative (ethnographic) techniques are the most logical course to follow.

As all case studies were also evaluations of specific information technologies, some further elaboration on the type of evaluation is called for. In the literature on the evaluation of IT projects in healthcare it has become increasingly clear that qualitative methods are called for, as these projects dynamically unfold over time, and are increasingly seen as interweaving organizational and technological change in complex ways (33, 34). The role of the evaluator him or herself however has been hardly discussed. Within this project, questions concerning the role of the evaluator were taken up by using several versions of evaluation, ranging on a scale from full outside evaluation to versions of action-oriented research. The OZIS case is an example of a more traditionally fashioned evaluation, where the researcher tries to stand outside the practices under study, in order not to influence those practices. Although such a detached position is never completely possible within the confines of a qualitative study (i.e. the interaction during an interviews is, besides a collection of data always also a form on intervening in a practice (35)) this study tried not to interfere with the working practices themselves in any direct way. The eye care cases went one step beyond that, in the sense that results from the evaluation were discussed with project leaders on a regular basis in order to steer the project as it was going. This form of evaluation, referred to in the literature as 'formative evaluation' (36), recognizes that the role of the evaluator in an ongoing project is not confined to the formal act of evaluating, but is also one of intervening. In the third project, ZorgDomein, this position was further explored by intensifying the formative evaluation, making this an explicit part of the project design. By doing so, the evaluation became geared towards intervening in the project. Also, more explicit use was made of the model of situated standardization mentioned above, to target intervention. On the one hand, this more active involvement in the projects under study enabled the steering of the projects on the basis of intermediate results, thus strengthening the implementation process in a area where so many projects fail (37), while also taking seriously the call for normative interventions within the STS literature (38). On the other hand, becoming part of the project makes the researcher face a classic dilemma of 'going native': how can one at the same time be part of a practice and study it?

In the addendum to this summary the papers that were written on the basis of the case studies are reproduced (see [onderzoeksrapport](#)

'Zorgprofessionals en ICT'). Together, these papers answer the research questions posed in this report. Chapter 1 (39) is concerned with the question of changing work relations among professionals in different settings as the result of the introduction of information technologies that enable (or sometimes frustrate) interprofessional communication. It deals with the ways in which interprofessional relations become inscribed in the information technologies. The chapter specifically deals with possibilities for task delegation between occupations in health care and the ways in which these can be supported by IT. Chapters 2 and 3 elaborate on these two cases and on the negotiated order of healthcare work between professional groups. Chapter 2 (40), focusing on ZorgDomein, discusses the standardization of referral and discharge letters as a way of bridging 'gaps' in healthcare. As integrated care is seen as a way to remedy patients who are 'left in limbo' the standardization and subsequent informatization of letters is increasingly called for. Bridging, as the study shows, however also creates or articulates new boundaries between occupational groups. In this specific case, this became focused, amongst others, on the position of primary care diagnostics, on the one hand strengthening the position of general practitioners vis-à-vis the hospital, on the other increasingly problematic in the competition for the diagnostic market. The ways in which letters are standardized within the information technology, also ascribe roles to the different healthcare professionals involved in the patient care trajectory that at times conflict with the actual practice of care. Furthermore, existing hierarchical relations within health care (e.g. those between general practitioners and medical specialists) seem to get reinforced by information technologies.

This last point is extended in Chapter 3 (41) that discusses the eye care cases. In this case it becomes clear the current relations between medical specialists on the one hand and optometrists or nurses on the other were reinforced by the information technologies used in the projects. Interestingly, the main mechanism at play in these projects was discussions on the quality of work. Shifting notions of quality—emphasizing what would be possible on the basis of the technologies in use rather than what was feasible and necessary to get work done—became dominant in the projects thus frustrating further collaboration. In this chapter also the role of the evaluators is analyzed.

Chapter 4 (42) discusses the development and implementation of the Open care information standard (OZIS) to enable the exchange of patient information between pharmacists. Problems in information exchange between professionals concerned with medication is identified as one of the main causes of medication errors (43) and information technologies are seen as a major possibility to remedy such errors. Any information technology used to exchange medication data will however interfere with the precarious professional relations between pharmacists, medical specialists and general practitioners. Questions that have to be addressed are for example who is the 'owner' of medication data, what information needs to be exchanged between healthcare workers in order to establish safe working practices? Also,

questions arise concerning the role of IT vendors, who have to build systems that enable communication between systems, whereas the dominant strategy has been to build clusters of the same system. As a first step to the development of shared medication data, and also as a way to remedy the problems that occur in pharmacists taking care of one another's patients ('dienstwaarneming'), the OZIS standard was developed in order for public pharmacists to share medication data. As the standard proved to be a relative success, the chapter asks how this can be explained given the differences of interests between the actors.

The last chapter (44) then deals with the question of the role of the researcher in action-oriented research projects. It does so by reflecting on our role in the ZorgDomein project as both evaluators of the project and active participants in it. Using the notion of 'traveling' we show that it is possible to both be a member of a project and study it at the same time, albeit at a loss. On the one hand, the explication of tensions between the different places in the project and between the project goals and actual work practices help to diffract (45) the central notions in the project, and to actually build situated normativities that help the project members to position themselves. Furthermore, being in such an active role one becomes affected by the project and to become part of the goals pursued therein, i.e. 'integrated care'. On the other hand, this same 'affectedness' makes it less easy to become an outside critic. This loss is probably inevitable if we want to take the notion of the situatedness normativities serious.

References

1. Dick RS, Steen EB, Detmer DE, editors. *The Computer-Based Patient Record: An Essential Technology for Health Care*. 2nd, revised ed. Washington, DC: National Academy Press; 1997.
2. Berg M, editor. *Health information management: integrating information technology in health care work*. London: Routledge; 2004.
3. Berg M, Bowker GC. The multiple bodies of the medical record - Towards a sociology of an artifact. *The Sociological Quarterly* 1997;38:513-537.
4. Berg M. Practices of reading and writing: The constitutive role of the patient record in medical work. *Sociology of health & illness* 1996;18(4):499-524.
5. Berg M. Medical Work and the Computer-Based Patient Record: A Sociological Perspective. *Methods of Information in Medicine* 1998;37:294-301.
6. Berg M. Of Forms, Containers, and the Electronic Medical Record: Some Tools for a Sociology of the Formal. *Science, Technology & Human Values* 1997;22(4):403-433.
7. Bloomfield BP. The Role of Information Systems in the UK National Health Service: Action at a Distance and the Fetish of Calculation. *Social Studies of Science* 1991;21:701-734.
8. Hanseth O, Monteiro E, Hatling M. Developing Information Infrastructure: The Tension Between Standardization and Flexibility. *Science, Technology & Human Values* 1996;21(4):407-426.
9. Schneider K, Wagner I. Constructing the 'Dossier Representatif': Computer-Based Information Sharing in French Hospitals. *Computer Supported Cooperative Work* 1993;1:229-253.
10. Bijker WE, Law J, editors. *Shaping Technology / Building Society: Studies in Sociotechnical Change*. Cambridge, MA: MIT Press; 1992.
11. Orlikowski WJ. The Duality of Technology: Rethinking the Concept of Technology in Organizations. *Organization Science* 1992;3(3):398-427.

12. Latour B. *Aramis, or the Love of Technology*. Cambridge, MA: Harvard Business School Press; 1996.
13. Akrich M. The De-Description of Technical Objects. In: Bijker WE, Law J, editors. *Shaping Technology / Building Society: Studies in Sociotechnical Change*. Cambridge, MA: MIT Press; 1992. p. 205-24.
14. Berg M. The Politics of Technology: On Bringing Social Theory into Technological Design. *Science, Technology & Human Values* 1998;23(4):456-90.
15. Rip A, Misa TJ, Schot J, editors. *Managing Technology in Society: The Approach of Constructive Technology Assessment*. London: Pinter; 1995.
16. Suchman L. Working relations of technology production and use. *CSCW* 1994;2:21-39.
17. Ball MJ, Collen MF, editors. *Aspects of the Computer-Based Patient Record*. New York: Springer; 1992.
18. Freidson E, editor. *Medical Work in America. Essays on Health Care*. New Haven: Yale University Press; 1989.
19. Kling R. Computerization and Social Transformations. *Science, Technology & Human Values* 1991;16(3):342-367.
20. Abbott A. *The System of Professions: An Essay on the Division of Expert Labor*. Chicago: University of Chicago Press; 1988.
21. Wagner I. Woman's Voice: The Case of Nursing Information Systems. *AI & Society* 1993;7:295-310.
22. Timmermans S, Bowker GC, Star SL. The Architecture of Difference: Visibility, Control, and Comparability in Building a Nursing Interventions Classification. In: Mol A, Berg M, editors. *Differences in Medicine*. Durham and London: Duke University Press; 1998. p. 202-225.
23. Goorman E, Berg M. Modelling nursing activities: electronic patient records and their discontents. *Nursing Inquiry* 2000;7(1):3-9.
24. Berg M. Accumulating and Coordinating: Occasions for Information Technologies in Medical Work. *Computer Supported Cooperative Work* 1999;8(4):373-401.
25. Robinson M. Computer Supported Co-operative Work: Cases and Concept. In: Baecker RM, editor. *Readings in Groupware and Computer-Supported Cooperative Work: Assisting Human-Human Collaboration*. San Mateo, CA: Morgan Kaufman; 1993.
26. Inspectie van de Gezondheidszorg I. *Staat van de Gezondheidszorg 2003. Ketenzorg bij chronisch zieken*. Den Haag: IGZ; 2003 november 2003.
27. Committee on the Quality of Health Care in America. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington: National Academy Press; 2001.
28. Berg M, Schellekens W, Bergen C. Bridging the Quality Chasm: Integrating Professional and Organizational Quality. *International Journal for Quality in Health Care* 2005;17(1):75-82.
29. Zuiderent T, Bal R, Berg M. *Anders Werken in actie: standaardiseren van zorginhoud en organisatie op de polikliniek hematologie / oncologie*. Rotterdam: iBMG; 2004 sept. 2004.
30. Strauss A, Fagerhaugh S, Suczek B, Wiener C. *Social Organization of Medical Work*. New Brunswick and London: Transaction Publishers; 1997.
31. Wiener CL. *The Elusive Quest. Accountability in Hospitals*. New York: Aldine de Gruyter; 2000.
32. Hayes SC, Barlow DH, Nelson-Gray RO. *The Scientist-Practitioner; research and accountability in the age of managed care*. 2nd edition ed. Bosten: Allyn and Bacon; 1999.
33. Kaplan B. Evaluating informatics applications - clinical decision support systems literature review. *International Journal of Medical Informatics* 2001;64(1):15-37.
34. Kaplan B. Evaluating informatics applications - some alternative approaches: theory, social interactionism, and call for methodological pluralism. *International Journal of Medical Informatics* 2001;64:39-56.
35. Guba EG, Lincoln YS. *Fourth Generation Evaluation*. Newbury Park, London and New Dehli: Sage Publications; 1989.
36. Stoop AP, Berg M. Integrating Quantitative and Qualitative Methods in Patient Care Information System Evaluation. *Methods of Information in Medicine* 2003;42(4):458-462.
37. Berg M, Aarts J, van der Lei J. ICT in Health Care: Sociotechnical Approaches. *Methods of Information in Medicine* 2003;42(4):297-301.

38. Woodhouse E, Hess D, Breyman S, Martin B. Science Studies and Activism: Possibilities and Problems for reconstructivist Agendas. *Social Studies of Science* 2002;32(2):297-319.
39. Bal R, de Bont A. Taakherschikking en ICT in de zorg. In: de Mul J, van der Laan L, editors. *Kennis in netwerken: Jaarboek ICT en samenleving 2005*. Utrecht: Lemma; 2005. p. 113-126.
40. Bal R, Mastboom F, Spiers HP, Rutten H. The product and process of referral. Optimizing GP-specialist communication through ICT. *International Journal of Medical Informatics* 2005;in press.
41. de Bont A, Bal R, de Mul M, Berg M. Face to face in a database: On trust and distrust, task delegation and professionals. *Qualitative Health Research* 2005;submitted.
42. Stoop A, Bal R, Berg M. OZIS and the politics of safety: Using ICT to create a regionally accessible patient medication record. *International Journal of Medical Informatics* 2005;in press.
43. Committee on the Quality of Health Care in America I. *To Err is Human: Building a Safer Health System*. Washington: National Academy Press; 2000.
44. Bal R, Mastboom F. Evaluating ZorgDomein: how we got entangled in interorganizational healthcare politics and survived as STS researchers. *Science as Culture* 2005;submitted.
45. Haraway DJ. Modest Wittness: Feminist Diffractions in Science Studies. In: Galison P, Stump DJ, editors. *The Disunity of Science*. Stanford, CA: Stanford University Press; 1996. p. 428-441.
46. Adams S, Bal R, de Jong J, Hiddema F. Full of promise, failed in practice: a discussion of barriers encountered during an attempt to integrate physician-patient e-mail communication in the care process at a Dutch Eye Hospital. *International Journal of Healthcare Technology and Management* 2006;7(3/4):252-265.
47. van der Ploeg I, Winthereik BR, Bal R. EPRs in the consultation room: effects on doctor-patient relationships. *Ethics and Information Technology* 2005;in press.
48. Ritzer G. *The McDonaldization of Society: An Investigation into the Changing Character of Contemporary Social Life*. revised edition ed. Thousand Oaks etc.: Pine Forge Press; 1996.
49. Zuiderent T, Bal R. Patients and their problems. In: *Patients and Pathways*. University of Manchester; 2005.