# Digitized patient–provider interaction: how does it matter? A qualitative meta-synthesis

# Authors: Hege Kristin Andreassen, Carl M. May, Catherine J. Pope, Line Lundvoll Warth and Kari Dyb

# Journal: Social Science and Medicine

# Acceptance Date: 30th August 2018

# Digitized patient–provider interaction: how does it matter? A qualitative meta-synthesis

# Abstract

Sociological interest in the digitization of health has predominantly been studied using qualitative approaches. Research in this field has grown steadily since the late 1990´s but to date, no synthesis has been conducted to integrate this now rather comprehensive corpus of data. In this paper we present a meta-ethnography of 15 papers reporting qualitative studies of digitally mediated patient – professional interactions. By dissecting the detailed descriptions of digitized practices in this most basic relationship in health care, we explore how these studies can illuminate important aspects of social relations in contemporary society. Our interpretative synthesis enables us to reassert a sociological view that places changes in social structures and interaction at the core of questions about the digitization of health care. Our synthesis of this literature identifies four key concepts that point at structural processes of change. We argue that when patient-professional interactions are digitized, relations are *respatialized,* and there are *reconnections* of relational components. These lead to empirically specific *reactions*, which can be characterized as reconstitutions and renegotiations of social practices which in turn are related to the *reconfiguration* of basic social institutions. We propose a new direction for exploring the digitalization of health care to illuminate how digital health is related to contemporary social change.

Keywords: meta-ethnography, meta-synthesis, digital health, e-health, telemedicine, telecare, patient-provider interaction, medical sociology

# Introduction

The deployment of ICT in health – which we here refer to by the shorthand e-health - has grown steadily in recent decades and research that investigates it has also flourished. Sociological methods and theory have been pivotal in understanding the different domains in which e-health has developed how digital technologies have been used in health care. This work has been part of a much wider sociological engagement with the dynamics and meanings of sociotechnical change, the ways that these are experienced, and their wider effects in shaping social relations and practices (see for example, Sassen, 2002; Wajckman, 2002). The idea that major sociotechnical transformations are occurring, and that – in the advanced economies, at least – these motivate and shape important changes in social relations, is common to several traditions of sociological thought (e.g. Beck et al., 1994; Callon, 1990; Fligstein, 2002; Granovetter, 1985; Wajcman, 2008). The sociotechnical approach is thus highly relevant to e-health research, and has been an important point of departure also for these authors in previous works (Andreassen, 2011; 2015, May 2001; 2015; Pope, et al 2013; Turnbull, et al 2017).

Indeed, the practice of e-health exemplifies some key characteristics of late modernity: it eliminates distance as an obstacle to interactions; it accelerates interaction processes in conditions where time itself is an organizational and individual resource that is perpetually placed in question; and it restructures both processes of care and the practices of labour market segmentation that support them. These shifts are often framed in terms of neo-liberal discourses of efficiency gains and improved access (Greenhalgh et al., 2012; Klecun-Dabrowska & Cornford, 2000). Equally, they are understood in terms of defending scarce health care resources and services from the unsustainable and unwarranted demands of a growing group of people with chronic illnesses (May, 2015).

In this paper we seek to step beyond the limits of micro-level studies of e-health and reassert a sociological view that places contemporary changes in social structures and interaction at the core of our questions about the digitizing of health care. To accomplish this we employ an integrative method of evidence synthesis that allows us to survey the literature and combine interpretations to support conceptual and theoretical advance. We focus on interaction chains in the most basic relation on which all health care is built; namely the patient-professional relationship, and we explore the ways that existing interpretations of digitally mediated patient-professional interaction can inform us about structural changes in late modernity.

Sociological interest in the digitization of health, and hence the mobilization of particular instances of e-health practice, has often been focused on socio-materiality, and particularly on questions of performance and performativity that are central to Science and Technology Studies. The work of Diana Forsythe in the US (Forsythe, 1999; Forsythe and Buchanan, 1991) and Marc Berg (1992; 1998) has played a central part in setting this research agenda, and also in encouraging the use of qualitative research approaches. The ubiquity of qualitative investigation in this field reflects a fundamental problem of the organization and evaluation of e-health interventions themselves; they are characterized by highly localized, small scale, fragmented demonstration projects that make up the research literature in the field (Andreassen et al., 2015, May et al. 2003). Only very recently has the research literature come to include studies of the operationalization and performance of large-scale e-health systems (Agbakoba et al, 2015; Best et al. 2012; Devlin et al., 2015; Greenhalgh et al., 2009; Hendy et al. 2012; Steventon et al. 2012).

 It has been argued that performative approaches have explanatory value for studying digitization (Pope et al, 2013). Work on the situatedness of digital technologies and frequent evidence of resistance to their deployment has been much debated and has surprised policy makers and technology developers. A focus on micro level action is well suited to examining the interplay between humans and technologies in local settings, and can explain why technologies fail to normalize seamlessly into health care services. However, the performative approach typically skirts around important macro-level sociological questions about structure and power and presents a significant gap in our understanding of what e-health is and how it matters to moral and political discussions on asymmetrical structures in health (Andreassen and Dyb, 2010). E-health needs to be addressed at a structural level to fully understand what the digitising of health care means, and to explain its relation to changing hierarchies of knowledge and power in contemporary society.

# Methods

We conducted an interpretive synthesis of 15 studies, using methods informed by meta-ethnography (Noblitt & Hare, 1988), with the aim of integrating evidence for conceptual and theoretical development. Meta-ethnography is the most commonly used method for synthesising qualitative evidence (Hannes and Macaitis, 2012). It has the benefit of being anchored in the interpretive tradition of research (making it suited for the analysis of qualitative studies) and allowing a broadly inductive approach to conceptual development that seemed suited to the problem at hand. Our synthesis approach followed the 7 phases outlined by Noblitt and Hare. Our use of these is schematically described in Table 1, and in depth in the methodological appendix to this paper (online supplementary materials).

Our interest in the topic for this synthesis grew out of ongoing discussions between applied social science researchers working in a research and development centre directed to developing e-health solutions in response to government policy, and academic researchers with expertise in evaluating digital technologies and in qualitative synthesis methods. Our approach built on the authors’ extended knowledge of the field when designing the synthesis, both in formulating the research question and selecting papers.

Much of the literature exploring digital communication in health care is located in the disciplinary field of informatics and is concerned with differentiating between technologies. In contrast, our research question frames the *commonality* of technologies, namely that they all digitally mediate interaction. We asked a deliberately broad question *what can digitally mediated patient – professional interaction tell us about* *structural changes in late modernity,* because we wanted to explore the impact of these digital technologies beyond simply delivering a health care service.

Papers were identified using systematic literature searching methods including a keyword database search and extensive hand searching informed by the authors’ existing knowledge of the literature (Booth, 2016). We used reference chaining from selected papers to extend the search. The selection of papers was purposive and as in primary research we aimed to include a range of exemplar studies that captured variation in interpretations offered in the literature. As in primary research we constantly asked what might be missing from the accounts identified.

In phase 3 (see Table. 1.), we applied our inclusion criteria to a total of 254 papers. This left us with 15 papers for the final sample.

####  Inclusion criteria

* Papers written in English
* Work from certain geographical areas: West Europe, Canada, Australia and US
* Papers published in peer-reviewed journals
* Papers describing experiences with technologies that can mediate social interactions through space and time in the patient-professional relationship
* Papers published between 1997-2015
* Interpretative qualitative research, i.e., papers presenting analytical interpretations
* Only one paper from each empirical study

To determine how the papers were related (phase 4), second order concepts were extracted from each individual paper by all authors. An example of a second order concept is domestication. While this exact term was not used in every paper, we identified several examples of technologies that allowed the work of health care to transfer out of the clinic and into to the domestic (home) setting. Realising that this might be an important feature of digitized patient–provider interaction we labelled each instance of ‘domestication’, discussing among the research team if there was confusion about terms and ideas conveyed. We used post it notes and colour coding to mark concepts and to support discussion and grouping of the concepts identified in this way. This record was transferred to an MS excel spread-sheet to facilitate team discussion as the research progressed and new insights were gained. This archive informed the schematic reporting of findings presented in the summary Table 3. We used a classic matrix to display studies (identified by author names) against second order concepts identified. This facilitated comparison and translation of concepts (phase 5) and the development of the third order concepts shown in fig 1.

# Findings: third order interpretations

Constructing a set of findings or results in qualitative meta-ethnography involves a continual interplay between the operationalization of a set of research methods; a corpus of data (in this case 15 texts (see Table 2) and the theoretical perspectives informing the work. All methods have their limitations, and in our case as in others both the inclusion criteria and the theoretical perspectives informing the work have framed the analysis. Searching through non-English literature, including more of the so called “grey literature” and including more than one paper from each study could have enlarged the volume of our material. For our purpose of combining interpretations to support conceptual and theoretical advance however, the selected inclusion criteria were beneficial. Through following the procedures of the meta-ethnography we got closer to the actual synthesis and the expression of the line of argument at each step of the procedure. This process resembles conceptual development in primary research; it entailed iterative readings of the data and coding, interrogation of the analysis and critical discussion. Through following such a process we were able to integrate the second order concepts under four new headings, or ‘third order interpretations’. These may be understood as integrative themes that underpin our interpretation. These themes point at structural dimensions of e-health deployment and we chose alliterative terms beginning with the letter r to make these memorable: respatialization, reconfiguration, reconnection and reaction (see Table 3).

## Respatialization –relocating care in space and time

The infrastructure of contemporary healthcare was at the centre of nearly all accounts across the 15 papers. They illuminate how e-health systems reach out from the spaces in which their clinical users are located. This has relational consequences: May et al. (2001), Nicolini (2007), Roberts (2012) and Pappas and Seale (2009) all explore the ways that e-health undercut the centrality of physical co-presence in interactions between professionals and patients. It is the transfer of work that matters, though; Gale and Sultan (2013) and Oudshoorn (2008) elaborate on the ways that altering the spatial relations of the clinic changes meaning and experience of the home. Finch et al. (2008) assert that respondents in their study characterized e-health as an enabling technology,

*“permitting patients to access secondary care services through primary care locations, and increasingly from the patient’s home. This reflects a widely held view that patients ´prefer to be treated locally´ or ´dislike going to the hospital”* (Finch et al., 2008, p. 89).

Assumptions about patient preferences do not always accord with their experiences, however. Oudshoorn points to the ways that technology transforms the home into an electronic outpost of the clinic and she remarks that,

*“Homes are not constituted only by people. Quite to the contrary, in our technological culture, homes are increasingly populated by technical devices. ” (Oudshoorn 2012, p. 128).*

She underlines that new devices change the experience of the home and make the illness (i.e., the heart problem) of the users a more active theme in their home. Gale and Sultan (2013) make this even more explicit through their concept of the home as a “primary health space”. They demonstrate how a new e-health system for people with COPD patients transformed their domestic spaces into repositories of complex electronic equipment (op.cit, p. 143). In contrast to Oudshoorn, Gale and Sultan conclude that because patients with COPD often have severely restricted mobility and spend a large proportion of their time at home, the introduction of new technology might not have the disruptive effect (on the home) that might be intuitively expected (op.cit, p. 142). In sum, we can conclude that several of the papers in our selection highlights how proponents of e-health often use the dynamics of pathophysiological deterioration as a way of minimizing the demands that these technologies make on the domestic environment, and equally often exclude the other occupants of these spaces from their analyses.

E-health systems can also change the ways that people use or experience other spaces than their homes. Melander-Wikman (2008) shows how mobile safety alarms create virtual safe space in which mobility is perceived to be less risky and reduces dependence on others. In contrast, Oudshoorn´s (2012) study of ambulatory ECG recorders shows how audible alarms turn monitoring devices into disruptive actors that revealed health problems to others in public spaces. Oudshoorn explains that

*“the safety alarm was part of a technogeography of care that transformed shopping malls and trains into scary spaces in which patients’ failing bodies were exposed to others’* (Oudshoorn, 2012, p. 135).

Further, respatialization has temporal consequences. May et al., demonstrate how an e-health intervention in psychiatric treatment problematized time as a corporate resource for patient–provider interaction. They illustrate how psychiatrists faced a “structural” problem that derived from the use of the videophone unit for speedier access to assessment.

*“Psychiatrists discovered that the existing waiting list (about six weeks) for a face to face appointment actually worked in their favour. Those patients whose referral was sparked by some major existential crisis and who attended the improved access clinic (sometimes the day after being referred) were often still in a highly volatile emotional state. Psychiatrists saw this as a signiﬁcant therapeutic problem”* (May et al., 2001, p. 1895).

While May et al., (2001) focus on the reconfiguration of corporate time, Rogers et al (2011) and Oudshoorn (2012) show how e-health transported the temporal order of the clinic into domestic spaces. Here, patients (and their families) needed to participate in new clinical practices in a disciplined way, for example, performing vital sign monitoring at a set time every day. E-health systems can act to confine their users within domestic spaces too. Oudshoorn describes;

*“the use of the telecare device takes more than just a few minutes. Hence, patients are not free to choose when to take their measurements or to interact with the telemedical centre. Consequently, the device requires that patients remain at home all day, and its ‘script’ thus assumes that patients are homebound”* (Oudshoorn, 2012*,* p.130).

E-health systems reach out from the spaces in which their clinical users are located, and change the meaning of patient homes and the primary health space.

### Instrumental, emotional and contested reconnections

E-health systems change spatial and temporal relations between the clinic and the home, but they also claim to *reconnect* people and entities. Pols and Willems capture this, and at the same time emphasize the implicit power relations involved in it;

*“The metaphor for the telekits identity here is the telekit as ‘the umbilical cord’ that attaches the patient to the clinic and allows them to be ‘fed’ some more of the clinic’s wisdom. “* (Pols and Willems, 2011, p.491).

Pols and Willems’ (op.cit) analysis reveals an important paradox. The motivation for e-health programmes is to solve problems of spatial and temporal relations: the distances that must be travelled; the efficiencies that must be gained; the real estate that must be maintained; and the actors that must be co-present. However, solving these policy problems with digital interventions does not eliminate the problem of distance, rather it may make distances visible.

Typically, critical accounts of e-health systems draw on the question of how remote monitoring is organized and experienced. Once again, transfers of work and accountability from the clinic to the home are central to this. Papers included in our synthesis highlight how patients, and perhaps members of their families, are implicated in social practices built around surveillance and around assumptions of docility and cooperation in disciplined and skilled activity (Rogers et al., 2011); how they must be skilled assessors of disease progression and symptoms (Oudshoorn, 2008); technically accomplished with software and devices (Fairbrother et al., 2013); disciplined timekeepers (Gale & Sultan, 2013); and prudent in the demands that they place on the service (Roberts et al., 2012). Not surprisingly, given these multiple demands on skills and spaces, there is strong emphasis on the importance of educational content of interactions between professionals and patients across electronic space.

Education is not always about the clinical condition of the patient. Melander-Wikman (2008), Mort et al., (2012) and Roberts et al. (2012), all present studies where it is clear that “education” has a disciplinary component – and is about inculcating behaviour norms in relation to the service, as much as it is about the reassurance and security that e-health systems can provide their users. In this context, reconnections are about instrumental exchange relations. The system (and its operators) provides the patient with material assistance, security and assurance; in return the patient provides the system with informational and behavioural rewards. These elements appear to be important across all of the studies included in our synthesis.

Reconnection involves a set of practice relations, but it also reflects questions about emotions and self-identity. An important way in which this is played out in the literature is through the counter-positioning of ‘peace of mind’ and ‘anxiety’ amongst patients. The former is a positive effect of the state of surveillance that is engendered by these systems. But it is not always so. Oudshoorn (2008) describes how the close scrutiny required by the e-health system she studied reinforced a patients experience of a failing body, and that it thus became a burden for him to watch the digital messages and graphs. In the other paper by the same author she states:

*“For some patients, acting as a diagnostic agent can thus be so hard that doubt turns into non-use”* (Oudshoorn, 2012, p.278).

Just as the presence of e-health systems can be disruptive and intrusive across social space and time, they can also be constructive of ideas about safety and care; a point that is emphasized across 10 of the 15 papers in our synthesis (Andreassen, 2011; Fairbrother et al., 2013; Gale & Sultan, 2013; Melander-Wikman et al., 2008; Mort et al., 2012; Oudshoorn, 2012; Pols & Willems, 2011; Roberts et al., 2012; Rogers et al., 2011; Young et al., 2006).

Negotiations around reconnections through e-health systems feature in 10 of the studies contributing to our meta-ethnography (see Table 3). Through our synthesis, a paradox appears; namely that sociotechnical systems that aim to empower patients to act autonomously may actually lead to new dependencies, by creating expectations of new relationships or compensating for the loss of old ones, i.e. they forge reconnections to the system.

### Reactions: Domestication and resistance

How do users respond to systems for digitized communication in health care? All of the studies included in this synthesis suggest ways in which social identities and interaction chains are altered in the presence of electronic intermediaries. All of the papers characterize different forms of responses to those altered states. For patients these stretch out on a continuum between *domestication* and *resistance*. Domestication, whether it results from the adaptation or resignation of its users is the dominant response. Even so, Mort et al., showed how some patients refused to use the installed telecare system in the prescribed way:

*“They did not wear their pendant alarms or, more commonly, were selective about when and where they put them on”* (Mort et al., 2012, p.7).

It is important to remember here that many of the papers included in this synthesis represent studies of *projects* – temporary assemblages of practices tightly coupled to protocols and plans – rather than normalized services that are embedded in routine practices of healthcare delivery. In this context, adaptation and negotiation are important components of users’ responses. But these relational processes are complex. Fairbrother et al., (2013) point to the ways that in the remote monitoring of COPD patients seemed to be empowered by improved access to clinical information, but at the same time seemed also to be more dependent on the health professionals that provided it. Domestication can also take place through trade-offs: Finch et al (2008) show how patient preferences between forms of service delivery represent trade-offs between multiple priorities for patients; Melander-Wikman et al., (2008) presented an analysis of patients who see themselves as living in a ‘society of surveillance’ and whose feelings ‘were those of resignation’ (p. 343); and Oudshoorn (2008) characterised the telecare system in her study as an unwelcome intruder that disrupted the daily lives of its users (p. 1898).

The findings presented thus far have illuminated patient reactions to digitized health interactions. The next section will illustrate that not only are patients’ social identities and relations altered through e-health, health work and labour processes are also reconfigured.

### Reconfiguring – who does the work, what are the tasks?

Reconfigurations of health work were reflected in all of the papers included. Changing patterns of knowledge and practice are configured in new forms of labour process that include patients and sometimes their family members. They have become a new unqualified labour force that is woven into the changing techno-geography of care. Oudshoorn (2012) calls these patients new kinds of “diagnostic agents”. E-health has an important impact on labour processes and professional roles within healthcare provider organizations too. For example, the redefinition of nursing roles and work is evident in the studies by May et al., (2001), Nicolini (2007) and Gale and Sultan (2013). Professional roles, e.g., between doctors and nurses or health professionals and call-centre operatives, become blurred or overlapping. New ways of working appear in this field. The triadic consultation, between a primary care physician, a hospital based consultant, and the patient appears in three papers (Finch et al., 2008; Mort et al., 2012; Pappas & Seale, 2009). This represents a rearrangement of powers in practice, as it is a radical change in the interaction chain. Discretion over who does the work, and what the work of e-health is, is flexible. Mort et al. describe an installation engineer who took a more active role in the distribution of public care than planned. They show how he refused to follow a social worker’s prescription when installing e-health devices, leaving a prospective user’s house without installing anything at all, because he judged the patient unsuitable for this particular intervention (Mort et al., 2012, p. 9).

In sum; our synthesis illustrates how the power to define work and responsibilities fluctuates when interactions in health care are digitized.

In addition to changes in who does the work – as described in the previous paragraph - there are changes in what the work consists of. Negotiations on the distribution of tasks between professionals are an important topic in two of the studies included (Finch et al., 2008; Pappas and Seale 2009). They underline that, not only does technology bring new tasks to the table, i.e., operating new technical devices, but systems for digital communication also implies more invisible work for both professionals and patients: Roberts et al. (2012), draw attention to the emotional work the “teleoperators” are undertaking when they provide verbal care and social contact to the clients; Oudshoorn (2008) underlines the task of “comforting and reassuring patients about their ability to master the technology”; and May et al. (2001) observed how the taken for granted “soft technology of communication skills in physician-patient interaction was drawn into contention” by the telepsychiatry project they investigated. A key lesson from their study was that e-health might complicate social relations rather than make them “efficient”.

In this meta-ethnography we have identified altered tasks as a concept that has transfer value across the studies included. This concept highlights how new structures demand new actions, and therein alters existing landscapes of social status, i.e; hierarchies. Some work that has been invisible prior to digitizing still remains invisible and thus gives no status, but it also happens that previously invisible work becomes visible, and vice versa.

When patient’s tasks and roles are altered, so is the way people understand and think about their identities and work. E-health technologies offer new methods of monitoring and interaction and we find it interesting that the wide range of devices that actively and autonomously intervene in patients’ bodies (for example, remotely monitored drug delivery systems, or implantable cardiac devices) are rarely included under the ambit of e-health. E-health in this context seems to be in a liminal place, with patients who require monitoring and disciplining around health behaviours and interactions with healthcare systems. It is these behaviours and interactions that form the illness; the problem around which the systems with which we are concerned in this paper are formed. They reconfigure relations and define a set of activities that constitute care. Pols and Willems observed that;

*“unleashing the telekit […] leads to a conflict about the goals of the treatment that was new to the rehabilitation clinic”* (Pols and Willems, 2011, p. 490).

Digitally mediated interaction challenge the core values and ideals on which health care professions are built. This leads to complicated processes of negotiations and conflict on what health care work consist of, and what it means to be a competent provider; a good nurse or doctor.

Reconfiguring illness and families

The illness at the core of the patient-professional relationship is also reconfigured through digitally mediated patient-provider interaction. Roberts et al´s study shows that a telecare system for older people in the UK shapes and reflects ideas about thresholds for care, and thresholds in health states. A respondent in their study claimed;

*“when it gets to telecare you know that they’re a whisker away from not being able to look after themselves”* (Roberts et al., 2012, p. 496).

Staged models of care matter because of the ways that ideas about patient identities and clinical pathways are constructed in relation to hardware:

*“telemonitoring may not only be improving access to practitioner support on a practical level, but by medicalizing the condition is leading patients to reconceptualize their ‘lifelong health problem’ as a ‘real illness’ which is deserving of medical attention. In this context, ‘compliant self-management’ promotes a medical model in which dependence on professionals, and thus access to more timely care and treatment, is helpful”* (Fairbrother et al., 2013, p. 6)

Finally, e-health systems also involve reconfigurations of relational practices around families. In two of the studies included, Andreassen (2011) and Young et al. (2006) the patients were children. In these studies the parents were in practice the users on the ‘patient side’ of the systems for digital interaction. Andreassen found that

*“parents confirmed and displayed their competence in information gathering through their participation in digital communication (projects) with the health care system”* (Andreassen, 2011, p. 525).

Young et al. observed that the system decreased the burden of care, gave relief from parents’ feelings of guilt related to siblings (of the sick child) and contributed to the rebuilding of the family unit. Andreassen also identified a practice of “shielding the children from the medical gaze” through using the system for digital interaction instead of face-to-face meetings with health personnel, and that this “contributed to the performance of normal in times of illness” (Op.Cit 2011: 525). Thus reconfigurations of family roles and of the sick/stable child were topics in these papers. Roberts et al. claims that

*“telecare depends on ‘old-fashioned’ social networks of carers who are at least potentially co-present, and who can be mobilized in instances of uncertainty or need”* (Roberts et al., 2012, p. 499).

Crucially, family members can act as interpretive intermediaries, shaping the space in which their sick relatives experience e-health systems, and also defending that space from the intrusions of others. Social networks to be mobilized act as a prosthetic family to be deployed in order to regain – or obtain – optimal function in new interaction chains.

### Line of argument

The four key concepts identified through this synthesis help us identify some of the structural changes happening in the wake of digitization of patient-provider interactions. The line of argument arising from our analysis (illustrated in Figure 1) is that respatializations and reconnections fostered by digital communication technologies do provoke certain reactions, and these, in turn, lead to structural reconfigurations of core social institutions like work, lay-expert communication on illness, and families. As illustrated in Figure 1., our line of argument is that the processes of change linked to digitized patient-provider interactions can be understood as a feedback loop.

Communication transgressing time and space is the intention behind much e-health development. This is nicely captured in the much supported vision “closeness at a distance”, frequently used in the field - across policies and research and development projects alike. The emergence of “respatialization” and “reconnection” as important concepts in our meta- ethnography can be interpreted as a confirmation that this is what is happening, and as such this is not a surprise. What is new from our study is the detailed look into the “reactions” to this change – not from one particular project or case, but across multiple qualitative studies; and further the concept of “reconfigurations”, i.e., consequences of these reactions. Our analysis thus reveals how the digitalization of patient-provider interaction leads to altered interaction chains in health, affecting structures of participation, power and influence. These changes are not only important in the one-to-one relationship between the provider and the patient; rather they reach into the structuring of work, illness and families at a macro level as well. Hence, our meta-ethnography from the field of digital mediated patient-professional interaction has transferability; it identifies some core concepts that illuminate and study structural changes currently happening in our contemporary digital society.

### Theoretical propositions

#### Respatialization

Socio-geographical structures are changed when digital mediated interaction is facilitated. Place, space and time are framing social relations differently today than in previous, pre-digitalized eras. Our qualitative synthesis demonstrates how medical practises are reaching out of the clinic and into new locations through digital interaction chains, and how patients’ homes become the primary health spaces for the elderly and people with chronic illnesses. There is a risk of isolating and stigmatizing recipients of care through dependencies on advanced stationary devices. Theoretically this means that the particular sociotechnical performance of isolation and stigmatizing of recipients of care through domesticated digital devices is a risk to be aware of. Furthermore, our material illustrates how time plays a major structural role in patient – provider interactions. E-health systems impose a new time frame on peoples’ activities.

Respatialization can thus be expressed as a theoretical proposition; an ensemble of social practices is defined by a set of spatial relations through which participants associate each other with its existing components. In processes of practice restructuring, these are reorganised as task reconfiguration and requires participants to move to new positions from which agentic investments can be made.

#### Reconnections

Further, through and by the new technologies reconnections are made between people and between people and systems, exemplified in our material especially by the relation between the lay patient and the expert system of medicine. Notions of “the expert patient” and descriptions of changes in the distribution of knowledge that equals the power balance between the lay populace and previous black boxed expert systems has been an important topic in sociology (Giddens, 1991). Whilst the potential of this development to empower patients and diminish the power of medicine and demedicalize society has been debated in other works (Williams and Calnan, 1996) we see in our material a tendency to reconnect patients to medical systems. Through the installation of technological devices in patients’ homes, accompanied by an increased frequency of contact (for example through daily monitoring) the strength of the patient – medical system connection is increased and does not appear to be liberating for patients. Reconnection to the system is also strengthened through emotional ties, patients increasingly rely on the digital system to keep them safe and ensure peace of mind. It should be noted that it is often not the professional themselves who are working to eliminate distance through e-health. Instead the elimination of distance is being imposed upon them by macro-level actors who seek to reorganize and modernize services, control demand and reduce costs. This is why e-health is attractive to policy-makers even though there is a lack of clear evidence that it achieves any of these policy objectives.

This empirically anchored understanding of reconnection can be expressed theoretically as an ensemble of social practices that are defined by affective, cognitive, material and relational components that are the focus of participants´ agentic investment. In processes of practice reconstructuring these are subject to task reconfiguration as new elements are introduced and existing elements are changed.

#### Reactions

When it comes to the patients’ reactions to the respatialization and reconnections taking place as part of the digitizing of health care, we found these stretch out on a continuum between domestication and resistance. A proposition derived from this meta-ethnography is that reactions are mechanisms of respatialization and reconnection that call on participants to reconstitute and renegotiate the content of an ensemble of social practices, the pattern of social relations in which they are situated, and the meaning structures by which they are attached to it. The extent to which reconstitution and renegotiation are practically accomplished depends on the degree to which participants domesticate it by normalising or resisting the process of reconfiguration.

#### Reconfigurations

All papers describe reconfigurations of social relations and identities in core social institutions, such as work and the family. The new insights from this synthesis is an understanding of how the detailed reactions to the respatialization and reconnection fostered by e-health systems and digital mediated interaction chains *profoundly reconfigure basic social institutions* as they play out. Health care management, administration, and policy makers often express expectations of digital technologies to effectuate and ease health care work, through standardisations and clarifications. Our synthesis shows that the opposite is happening. As phrased by Davide Nicolini (2007): work is “stretched out and expanded”.

Illness and the importance of illness as work, as an identity marker and as a topic for lay – expert communication is, not surprisingly, prominent in this material covering patient-provider interaction. But gender and family roles are also reconfigured, as described in several of the papers (see Table3). This finding suggests that digitally mediated communication might have different implications for patients who live alone as compared to those who live in families. Mapping family situations and integrating family members (and potentially other informal carers) as part of the techno-geography of care thus becomes not only relevant, but necessary when studying the implementation of new technologies for patient-provider interaction. Roberts (2012) found that for e-health to work, the patient needs to become more dependent on his or her micro-local social context: in practice this is often the family network. Who this is however, can of course vary, and in future research it would be interesting to investigate how this aspect differs according to patients’ age, socioeconomic status and other traditional demographic variables like ethnicity and gender. An important question to pursue in social theory and the applied field alike is thus how to integrate a life course element into theories and practice of digital society.

When it comes to the concept of reconfiguring work, our identification of a new agent/actor, “the primary care professional-the specialist consultant-together” is of note. This can be described as a new actor that meets with the patient in digitally mediated patient-professional interaction. The emergence of this structure is interesting in light of our research question on social structure in late modernity. It remains to be seen how the processes outlined in this paper will reshape power and knowledge relations between patients and providers, and between professionals. At the same time as ensuring easier access to specialist health care for more patients, it can be interpreted as a move away from the one-to-one personal communication that has traditionally characterised the patient – professional relationship. This seemingly reasonable trade off where patients and doctors renounce a personal one-to-one interaction frame in favour of more accessible care could also be studied from a structural point of view, i.e., does it support or counteract the fragmentation of care?

## Conclusion

A development towards more complex interaction chains accompanied by renegotiations and reconstitutions of social practices - potentially strengthening the ties between individuals and society’s expert systems, calls for a sociological comment. Our findings in this meta-ethnography underline the need for sociology to look at digitalising of interaction from new angles. The small-scale local performance of technologies and health is at the core of action, but we urgently need an analytic framework that looks towards structure at the same time. Whilst the small scale innovation projects fit well into neoliberal management and governance processes (Andreassen et al., 2015), answering questions about mechanisms of control and structural change is surely the pressing challenge for sociology. The on-going sociotechnical transformations in society have implications for the practice of health care professionals. There is a need to systematically single out the reactions to e-health in the many different patient-provider relations comprising contemporary health care. The diversity of patient-provider relations in the processes of establishing interaction is huge, and the use and understanding of e-health may vary according to professions, technical capacity at the level of the provider and the institution and not least; training and selected social determinants of best health care practice, such as gender. Through this meta-ethnography we have revealed that with the digitization of interaction, social structures are changing and new asymmetries arise. The interesting question to pursue is of course what the new hierarchies actually look like, and how they will change as digitization increases. How will power, risk and vulnerability be distributed across the macro structures of digital society?

## Acknowledgements

HKA, KD and LLWs contribution to this work has been funded through project grants from the Norwegian Research Council and The North Norway Regional Health Authorities Research Funds. CRM’s contribution to this work was made while he was a member of staff in the Faculty of Health Sciences, University of Southampton, UK.

###  References

Agbakoba, R., McGee-Lennon, M., Bouamrane, M.-M., Watson, N., & Mair, F.S. (2015). Implementation factors affecting the large-scale deployment of digital health and well-being technologies: A qualitative study of the initial phases of the ‘Living-It-Up’programme. *Health Informatics Journal*, 1460458215594651.

Andreassen, HK. (2011)What does an e-mail address add? -Doing health and technology at home. *Social Science & Medicine,* 72, 521-528.

Andreassen, H.K., & Dyb, K. (2010). Differences and inequalities in health: Empirical reflections on telemedicine and politics. *Information, Communication & Society,* 13, 956-975.

Andreassen, H.K., Kjekshus, L.E., & Tjora, A. (2015). Survival of the project: A case study of ICT innovation in health care. *Social Science & Medicine,* 132, 62-69.

Beck, Ulrich, Anthony Giddens, and Scott Lash. *Reflexive modernization: Politics, tradition*

*and aesthetics in the modern social order*. Stanford University Press, 1994.

Berg, M. (1992). The construction of medical disposals medical sociology and medical problem-solving in clinical-practice. *Sociology of Health & Illness,* 14, 151-180.

Berg, M. (1998). *Rationalizing Medical Work. Decision-Support Techniques and Medical Practices*. Cambridge MA: MIT Press.

Best, A., Greenhalgh, T., Lewis, S., Saul, J.E., Carroll, S., & Bitz, J. (2012). Large-System Transformation in Health Care: A Realist Review. *Milbank Quarterly,* 90, 421-456.

Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic approaches to a successful*

*literature review.* Los Angeles/London/ New Dehli/ Singapore/ washington DC/

Melbourne: Sage.

Callon, M. (1990). Techno‐economic networks and irreversibility. *The Sociological Review,*

38(S1), 132-161.

Devlin, A.M., McGee-Lennon, M., O’Donnell, C.A., Bouamrane, M.-M., Agbakoba, R., O’Connor, S., et al. (2015). Delivering Digital Health and Well-Being at Scale: Lessons Learned during the Implementation of the dallas Program in the United Kingdom. *Journal of the American Medical Informatics Association*, ocv097.

Fairbrother, P., Pinnock, H., Hanley, J., McCloughan, L., Sheikh, A., Pagliari, C., et al. (2013). Exploring telemonitoring and self-management by patients with chronic obstructive pulmonary disease: a qualitative study embedded in a randomized controlled trial. *Patient Education and Counseling,* 93, 403-410.

Fligstein, N. (2002). *The architecture of markets: An economic sociology of twenty-first*

*century capitalist societies.* Princeton University Press.

Finch, T. (2008). Teledermatology for chronic disease management: coherence and normalization. *Chronic Illness,* 4, 127-134.

Finch, T.L., Mort, M., Mair, F.S., & May, C.R. (2008). Future patients? Telehealthcare, roles and responsibilities. *Health & Social Care in the Community,* 16, 86-95.

Forsythe, D.E. (1999). “It's just a matter of common sense”: Ethnography as invisible work. *Computer Supported Cooperative Work (CSCW),* 8, 127-145.

Forsythe, D.E., & Buchanan, B.G. (1991). Broadening our approach to evaluating medical information systems. Proceedings of the annual symposium on computer application in medical care (p. 8): American Medical Informatics Association.

Gale, N., & Sultan, H. (2013). Telehealth as ‘peace of mind’: Embodiment, emotions and the home as the primary health space for people with chronic obstructive pulmonary disorder. *Health & Place*.

Giddens, A. (1991). *Modernity and self-identity*. Cambridge: Polity Press.

Granovetter, M. (1985). Economic action and social structure: The problem of

embeddedness. *American journal of sociology*, 91(3), 481-510

Greenhalgh, T., Humphrey, C., Hughes, J., Macfarlane, F., Butler, C., & Pawson, R. (2009). How Do You Modernize a Health Service ? A Realist Evaluation of Whole-Scale Transformation in London. *Milbank Quarterly,* 87, 391-416.

Greenhalgh, T., Procter, R., Wherton, J., Sugarhood, P., & Shaw, S. (2012). The organising vision for telehealth and telecare: discourse analysis. *BMJ Open,* 2.

Hendy, J., Chrysanthaki, T., Barlow, J., Knapp, M., Rogers, A., Sanders, C., et al. (2012). An organisational analysis of the implementation of telecare and telehealth: the whole systems demonstrator. *Bmc Health Services Research,* 12, 403.

Hannes, K., & Macaitis, K. (2012). A move to more systematic and transparent

approaches in qualitative evidence synthesis: update on a review of published

papers. *Qualitative Research*, 12(4), 402-442.

Klecun-Dabrowska, E., & Cornford, T. (2000). Telehealth acquires meanings: information and communication technologies within health policy. *Information Systems Journal,* 10, 41-63.

May, C., Gask, L., Atkinson, T., Ellis, N., Mair, F., & Esmail, A. (2001). Resisting and promoting new technologies in clinical practice: the case of telepsychiatry. *Social Science & Medicine,* 52, 1889-1901.

May, C., Mort, M., Williams, T., Mair, F., & Gask, L. (2003). Health technology assessment in its local contexts: studies of telehealthcare. *Social Science & Medicine,* 57, 697-710.

May, C., & Finch, T. (2009). Implementing, embedding, and integrating practices: an outline of normalization process theory. *Sociology*, 43(3), 535-554.

May, C.R. (2015). Making sense of technology adoption in healthcare: meso-level considerations. *BMC Medicine,* 13, 92.

Melander‐Wikman, A., Fältholm, Y., & Gard, G. (2008). Safety vs. privacy: elderly persons’ experiences of a mobile safety alarm. *Health & Social Care in the Community,* 16, 337-346.

Mort, M., Roberts, C., & Callén, B. (2012). Ageing with telecare: care or coercion in austerity? *Sociology of Health & Illness*.

Nicolini, D. (2007). Stretching out and expanding work practices in time and space: The case of telemedicine. *Human Relations,* 60, 889-920.

Noblitt, G.W., & Hare, R.D. (1988). *Meta-Ethnography: Synthesizing Qualitative Studies*: Sage Publications.

Oudshoorn, N. (2008). Diagnosis at a distance: the invisible work of patients and healthcare professionals in cardiac telemonitoring technology. *Sociology of Health & Illness,* 30, 272-288.

Oudshoorn, N. (2012). How places matter: telecare technologies and the changing spatial dimensions of healthcare. *Social Studies of Science,* 42, 121-142.

Pappas, Y., & Seale, C. (2009). The opening phase of telemedicine consultations: an analysis of interaction. *Social Science & Medicine,* 68, 1229-1237.

Pols, J., & Willems, D. (2011). Innovation and evaluation: taming and unleashing telecare technology. *Sociology of Health & Illness,* 33, 484-498.

Pope, C., Halford, S., Turnbull, J., Prichard, J., Calestani, M., & May, C. (2013). Using computer decision support systems in NHS emergency and urgent care: ethnographic study using normalisation process theory. *Bmc Health Services Research,* 13.

Roberts, C., Mort, M., & Milligan, C. (2012). Calling for Care: ‘Disembodied’ Work, Teleoperators and Older People Living at Home. *Sociology-the Journal of the British Sociological Association,* 46, 490-506.

Rogers, A., Kirk, S., Gately, C., May, C.R., & Finch, T. (2011). Established users and the making of telecare work in long term condition management: Implications for health policy. *Social Science & Medicine,* 72, 1077-1084.

Sanders, C., Rogers, A., Bowen, R., Bower, P., Hirani, S., Cartwright, M., et al. (2012). Exploring barriers to participation and adoption of telehealth and telecare within the Whole System Demonstrator trial: a qualitative study. *Bmc Health Services Research,* 12, 220.

Sassen, S. (2002). Towards a sociology of information technology. *CURRENT SOCIOLOGY,* 50, 365-388.

Steventon, A., Bardsley, M., Billings, J., Dixon, J., Doll, H., Hirani, S., et al. (2012). Effect of telehealth on use of secondary care and mortality: findings from the Whole System Demonstrator cluster randomised trial. *British Medical Journal,* 344.

Turnbull, J., Prichard, J., Pope, C., Brook, S. & Rowsell, A. (2017). Risk work in NHS

111: the everyday work of managing risk in telephone assessment using a computer decision support sytem. *Health, Risk & Society.* 19 (3-4), 189-208.

Wajcman, J. (2008). Life in the fast lane? Towards a sociology of technology and time. *The*

*British journal of sociology*, 59(1), 59-77.

Williams, S.J., & Calnan, M. (1996). The 'Limits' of medicalization?: Modern medicine and the lay populace in 'late' modernity. *Soc Sci Med,* 42, 1609-1620.

Young, N.L., Barden, W., McKeever, P., & Dick, P.T. (2006). Taking the call‐bell home: a qualitative evaluation of Tele‐HomeCare for children. *Health & Social Care in the Community,* 14, 231-241.

**Figure 1: The line of argument**

|  |  |  |
| --- | --- | --- |
|  | **Respatialization** of services |  |
| **Reconfigurations** of social structures | *Renegotiations and reconstitutions of social practices* | **Reactions** |
|  |  |  |
|  | **Reconnections** to the system |  |

**Table 1: The seven phases of a meta-ethnography**

|  |  |
| --- | --- |
| Phase 1: formulating the research question | What does digitally mediated professional-patient interaction tell us about structural changes in late modernity? |
| Phase 2: what is relevant to initial interest | English language, work from Europe, Canada, Australia, USA. Published as journal papers between 1997-2015. Focus on technologies that can mediate social interaction through space and time. Papers should offer analytical interpretations rather than simply descriptive representations  |
| Phase 3: reading the studies | Extract details about studies including participants, type of interventions, study settings and data collection /analytical methods (table 2) |
| Phase 4: determining how the studies are related | Identify common and recurring concepts from the papers: the high level concepts identified included space, time, instrumental connection, emotional connection, contest/negotiation around connection, domestication, resistance/ conflict, work, illness, and family (table 3) |
| Phase 5: reciprocal translation | Translating the studies into one another (table 3) |
| Phase 6: synthesizing translations | Develop a line of argument based on the relationship between the studies: this built on our specification of the themes of respatialization, reconnections, reactions and reconfigurations (Figure 1). |
| Phase 7: expressing the synthesis | Digitally mediated professional-patient interaction leads to renegotiation and reconstruction of social practices that creates reconfigurations of social structures (Figure 1). |

**Table 2: Studies included**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Paper** | **Country** | **Participants** | **Type of intervention** | **Setting** | **Data collection** |
| **Andreassen (2011)** | details omitted for double blind review | Parents | Web based tool/ electronic adress | Home, hospital | 12 interviews with parents |
| **Fairbrother et al. (2013)** | UK | Patients, professionals | Telemonitoring | Home, primary health care | 72 Interviews: 38 patients, 32 professionals |
| **Finch et al. (2008)** | UK | Health professionals, telemedicine experts, administrators, patient advocates, policy makers, technologists, researchers | Applications for teledermatology, telepsychiatry, telecardiology, telemonitoring, telephone | Primary health care, hospital, general medicine | 38 Interviews: 11 professionals, 6 TM experts, 4 administrators, 7 patient advocates, 4 policy makers, 3 technologists, 3 reserachers |
| **Gale & Sultan (2013)** | UK | Patients | Telemonitoring | Home | 7 interviews with patients |
| **May at al. (2001)** | UK | Professionals, technical experts and managers, patients | Telepsychiatry/ video-phone | Primary health care, Community mental health care | 13 interviews: professionals, technical experts and managers(15), patients(22) and 2 observations of the system in play and key meetings |
| **Melander-Wikman et al. (2008)** | Sweden | Patients | Mobile safety alarm | Home | 9 interviews with patients (5 elderly persons with functional limitations and 4healthy elderly persons) |
| **Mort et al. (2012)** | UK/Spain | Patients, social workers | Pendant/ wrist alarm | Home, call center | 12 interviews, 33 episodes of observations and 8 transcripts of citizen panels (UK) and 23 episodes of observations and 4 transcripts from citizen panels(Spain) |
| **Nicolini (2007)** | Italy | Professionals | Telecardiology, telemonitoring | Private call centre | Observation (3 years), interviews, discussion groups, documents |
| **Oudshoorn (2011)** | Netherlands/Germany | Patients, professionals | Telemonitoring: ambulatory ECG recorder and telecare system for heart failure patients | Home, telemedical centre, home care office | 17 interviews with physicians (2), nurses (2), GPs(2), patients (11) and 54 questionnaires for patients. Interviews with 5 users and 5 non-user patients. |
| **Oudshoorn (2008)** | Netherlands | Patients, professionals | Telemonitoring: ambulatory ECG recorder | Home, primary health care, home care, telemedical centre | 15 interviews with managers in home care offices(2), GPs(2) and patients(11), observation (2 days). 54 patients questionnaires |
| **Papas & Seale (2009)** | UK | Patients, professionals | Video mediated telemedicine consultations | Hospitals, primary care | 10 Videotaped recordings of randomly selected teleconsultations  |
| **Pols & Willems (2011)** | Nederland | Patients, volenteers, central carers in the clinic, techniciansm), manager, doctor, project leader | Telekit device with web cam | Rehabilitation clinic, home | 18 interviews with patients(9), volenteers(2), central carers in the clinic(2), techniciansm(2), manager(1), doctor from the develpong team(1), project leader(1). Observations at the clinic (6 months) and project documents, web-page and research protocol |
| **Roberts et al. (2012)** | UK | Professionals | Telecare monitoring centres | Monitoring centres | 7 visitis to 2 monitoring centres; observation in service managment meetings, social work offices, homes, housing association offices, smart homes, practitioner training meetings and telecare monitoring centres. Interviews with managers, workers, older people and families. |
| **Rogers et al. (2011)** | UK | Patients, professionals | Telephone consultation, remote monitoring and onlie consultations | Home | 31 interviews with patients(22) and spouses/carers (9). Observations of participants using the devices. Focus group interview of 5 users.  |
| **Young et al. (2006)** | Canada | Patents, adolecents | Video conferencing phone, remote vital signs monitors | Hospital transition to home | 48 Interviews with mothers(16), fathers(4), and adolecents. Each family participating 3 times each. |

**Table 3: The synthesis**

|  |  |  |  |
| --- | --- | --- | --- |
| **3rd order interpretations****Structural dimensions of e-health derived from meta-ethnography** | **2nd order interpretations****Concepts**  | **1st order interpretation****Conceptual categories** | **Primary research papers****Data**  |
| **Respatialization:** An ensemble of social practices is defined by a set of spatial relations through which participants associate each other with its existing components. In processes of practice restructuring, these are reorganized as task reconfiguration requires participants to move to new positions from which agentic investment can be accomplished. | **Space** | Home | 1-13, 15 |
| Public space | 6, 10 |
| Health landscape | 1-15 |
| **Time** |  | 1-4, 6-8, 10, 12, 15 |
| **Reconnection:**An ensemble of social practises is defined by affective, cognitive, material and relational components that are the focus of participants’ agentic investment. In processes of practice reconstructuring these are subject to task reconfiguration as new elements are introduced and existing elements are changed. | **Instrumental connection** | Educational | 1-4, 8, 10, 12, 15 |
| Safety alarm | 1, 2, 4, 6, 7, 9, 10, 14, 15 |
| **Emotional connection** | Peace of mind | 1, 2, 4, 6, 7, 10, 12-15 |
| Anxiety | 9, 10 |
| **Contest / negotiation around connection** |  | 1-3, 5, 7-10, 12, 13 |
| **Reaction:** Mechanisms of respatialization and reconnection that call on participants to reconstitute and renegotiate the content of an ensemble of social practices, the pattern of social relations in which they are situated, and the meaning structures by which they are attached to it. The extent to which reconstitution and renegotiation are practically accomplished depends on the degree to which participants domesticate it by normalizing or resisting the process of reconfiguration. | **Domestication** | Adaption | 1, 2, 4, 7-15 |
| Resignation | 6 |
| Trade offs | 2-6, 14 |
| **Resistance/conflict** |  | 1-3, 5, 7, 10, 12 |
| **Reconfiguration:**An ensemble of social practises is defined by affective, cognitive, material and relational components that are the focus of participants’ agentic investment. In processes of practice reconstructuring these are subject to task reconfiguration as new elements are introduced and existing elements are changed. | **Work** | How you think about the work  | 2, 5, 7, 8, 11-14 |
| Who does things | 2-5, 7-15 |
| What are the tasks | 2-5, 7-15 |
| **Illness** |  | 2-4, 7, 9, 13, 14,  |
| **Family** | Family roles  | 1, 2, 4, 9, 13 - 15 |
| The stable child  | 1, 9, 14, 15 |
| Prosthetic family  | 1, 6, 13  |