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Introduction

Information and communication technologies (ICTs) are increasingly used to intermediate the delivery of public services, with far reaching implications for work and employment (Baines et al., 2010; Halford et al, 2010; McLoughlin and Wilson, 2013; Mearns et al., 2015). One example of this is 'telecare' technologies intended to facilitate the delivery of services to individuals in their own homes. Telecare promises solutions to pressures on health and social care workers in the face of expanding needs and finite resources (European Commission, 2011; Milligan et al., 2011). Yet, despite the many projects, pilots, demonstrators and the like, it has repeatedly failed to become established in mainstream practice. Such failures have been attributed to weak links between policy objectives and the realities of the practice of care work (May et al., 2011), and to the sheer amount of additional work involved in bringing about the take-up and use of telecare (Nicolini, 2006).

This article aims to advance both practical and theoretical understanding of telecare from the perspective of work and employment. It is empirically grounded in insights from a three-year collaborative project funded as part of a European Framework programme. The project took place in northern Italy and the partners undertook to develop a low cost, easy to use telecare environment that would offer both health monitoring and social networking services for older people living alone. We show how a telecare project initially conceived in narrowly technical terms came to recover from near failure by recognising the broader local social contexts in which the work of care was accomplished.

We were guided by two research questions. Firstly, how are ICTs such as telecare implicated in changing the ways in which care gets done, and by whom? Secondly, by foregrounding the work of telecare and who performs it, what can be learned for design and implementation? To address these questions, we invoke the concept of the Total Social Organisation of Labour (TSOL), which provides a framework of understanding interactions and shifts between paid employment and various modes of unpaid work (Glucksmann, 1995; 2005; 2009; Taylor, 2004; Williams, 2013). Applying this framework to a context rich empirical study of how telecare was implemented in one city supports an element of generalizing theoretically about the processes of involved.

The article proceeds as follows. In the next section, we propose the utility of the TSOL framework as an analytic tool. We then introduce the Italian Telecare Project (*ITP*), describe its remit and scope, and explain the collection and analysis of the data reported. The following section reports changes and tensions in the work associated with telecare from the various perspectives of project teams, clinicians, social workers, volunteers and older people. After that, we use the TSOL concept to explore the distribution and re-distribution of care between the telecare systems and the local care environment. We conclude with reflections on the contribution our findings make to the understanding the social context in which telecare is embedded, and consider some of the implications for policy and practice.

Telecare and the work of care

Telecare is an important element of service reform because of its potential to reduce demands on the time and resources of overstretched public services by shifting the locus of care and associated roles and responsibilities (Milligan et al 2011; May et al., 2011). It has become increasingly recognised that the manner in which telecare and related ICTs become implicated in the reconfiguration of practices between different technical, professional and occupational groups can be highly complex (Nicolini, 2006, Ellingsen, and Bjørn, 2014). The technically assisted transfer of caring activity from the clinic to the home has informed interest in the 'invisible work' of family carers and cared-for people themselves (Brittain et. al. 2010, Oudshoorn, 2011, Rogers et al., 2011, Lupton, 2013). The separate evidence from these strands of research suggests that the work needed to accomplish telecare spans the boundaries of organisational employment and non-market work.

Glucksmann (1995) originally developed the idea of TSOL in response to the success of feminist thought in challenging the analytical privilege accorded to waged (and typically male) employment (Waring, 1999). The re-formulation of 'work' to make visible the sphere of domestic activity and care was credited with countering society's undervaluation of women and their contribution to social wellbeing (Beneria, 1999). Himmelweit (1995) contended that, on the contrary, incorporating unpaid care into an expanded definition of work had the deleterious effect of leaving personal and relational aspects of care even more invisible and undervalued. To counter the analytic weakness of an undifferentiated category of work, Glucksmann (1995) proposed the idea of TSOL. Her aim was to provide a more nuanced analysis which captured the diversity of working lives across domestic and institutional, paid and unpaid, formal and informal contexts, and that could help to account for the interdependencies between them (Glucksmann, 2005). The framework has been used to analyse transformations of work in contexts as diverse as factories and call centres (ibid.), volunteering (Taylor, 2004), community self-help (Williams, 2013) and elder care (Lyon and Glucksmann, 2008). The interconnections between different forms of work captured by the TSOL framework are represented in Figure 1 (adapted from Taylor, 2004 and Williams, 2011).

INSERT FIGURE 1 HERE

The formal/informal and the public/private are situated along a continuum on the horizontal axis, divided into paid work at the top and unpaid work at the bottom. Paid work, for example, may be informal if it is unregistered with no employment contract, as is the case, for instance, with the numerous migrant care workers ('badanti') who help to sustain the continuity of family care in Italy (Lyon and Glucksmann, 2008). In recognising six (rather than two) forms of labour, the framework is able to accommodate people's unpaid activities in the public sphere (Taylor, 2004). For example, unpaid work for a charity or a hospital is formal (and in many ways similar to employment) if it involves processes of selection, monitoring and appraisal (Lie et al., 2009).

Glucksmann's (2009) later work sought to position TSOL in the context of a wider socio-economic formation of labour. Drawing upon Harvey's (2007) extension of Polanyi's (1946) explanation of the economic as embedded within social relations and institutions, she identified four inter-related processes by which labour is distributed and organized. Firstly, there is 'exchange' or the work of transfer of ownership between actors and/or agencies, followed by 'distribution', specifically the means of moving work between actors and/or agencies. Thirdly, 'production' refers to the work of generating services and goods. Finally 'consumption' denotes the work increasingly required of consumers before or after the exchange of goods and services in order to use them. Applying the TSOL framework enables each of these processes to be examined against different permutations of paid and unpaid activities that can be labelled as formal or informal according to the actor, agency or context (Glucksmann, 2009).

The TSOL framework is an important analytical lens through which to examine telecare, we suggest, because it recognises care as a relational achievement negotiated between a range of different individuals, groups and agencies (Mol, 2008). It is thus a means through which some of the complexities of existing overlapping relationships between organisations, professionals, carers, communities, and older people might be better understood. Moreover, TSOL can help to identify and take account of the implications for these groups of attempts to deploy telecare in order to shift the locus of care into the domestic environment, and to pose the question about who is *telecaring* whom. We now turn to an empirical example of an attempt to design and deploy telecare systems to do just this. It was conducted in a neighbourhood in the municipality of Bologna, Emilia Romagna, Italy in the mid-to-late 2000s, and is referred to hereafter as *The Italian Telecare Project (ITP)*.

[The Italian Telecare Project and research approach](#)

The *ITP* was funded under the Ambient Assisted Living (AAL) initiative of the European Commission (EC). In order to meet the priorities of AAL, the project proposed to develop an innovative telecare

system to 'improve the quality of life of older people'. An important aspect of the rationale for the project was to build upon a service already being trialled in the city, known locally as Tele-accompany. This existing trial project provided befriending and support services over the telephone to isolated older people throughout the city. It employed a team of four qualified social workers who each called a panel of about 500 individuals every week to check on their health status and to maintain personal contact and companionship. Whilst regarded by the municipality government as a success, a serious limitation was that the call centre workers could only contact a maximum of 35 people per day, which made it a high cost intervention. Scaling up the trial service to meet the increasing needs of a growing older population was therefore not affordable. The municipal government's participation in *ITP* was predicated on the assumption that the technology would enable the development of a more cost-effective solution.

The aim of *ITP* was to develop and deploy a range of digital technologies to reduce the loneliness and isolation of older people. The project was made up of three components: design and piloting of a Tele-accompany system for supporting isolated older people; a tele-medicine system for monitoring health conditions; and the development of a platform or hub to be based in the homes of older people to support both Tele-accompany and tele-medicine services.

The new 'Tele-accompany' service was intended to encompass advice and information on health and social care, and to support the building of peer-to-peer community networks - described as 'medicine or therapy in itself'. The notion of community here included the spatial (neighbours), shared interests (such as gardening), and relational (family, friends or care networks). The tele-medicine aspect of the project was conducted in two small-scale pilots for monitoring health conditions. Each pilot involved only 10 patients, one in Bologna, Italy for cardiac patients and one in Prague, Czech Republic (beyond the scope of this article) for diabetic diseases. These pilots took the form of feasibility assessments rather than clinical trials and the quantitative and qualitative measurements were intended to provide a 'proof of concept' and the basis for the design of future trials. The *ITP* as a whole involved partners from six countries and relevant ethical approvals were acquired according to the local arrangements concerning research governance for each country.

Representatives of the municipality, working with the existing Tele-accompany service, selected and recruited older people from the client base of that service to participate in *ITP*. The basis for selection was residence in a specific area of the city, being over 75, and living alone. The recruitment target for the project was 100 participants. For the tele-medicine part of the project, patients were recruited from the same group, with the further requirement that they had been diagnosed with Chronic Heart Disease (CHD). Participation was voluntary and all recruited participants received a home visit which included system installation and training.

The authors were responsible for the project work packages concerned with user-engagement and its evaluation. We worked in collaboration with the Italian project partners, who were computer hardware and software experts, local universities, clinicians, and local government officers. Our role as academic members of the project team was to engage with the various communities potentially involved in the use of the proposed telecare system, including older people who participated in the pilots. We did this through not only the design and evaluation of the technical platform itself, but also in the co-productive envisioning of a new service environment for the Tele-accompany and tele-medicine services within the wider system of care (Wilson et al, 2012, McLoughlin et al. 2012).

We undertook a series of research activities as part of this role in the project. In this article we draw upon data from a combination of naturally occurring and researcher occasioned interactions. We conducted ethnographic observations of project team members and managers from the participating organisations, and of front line staff in health and social care who worked closely with the 'users', older people themselves. These front-line staff were medical practitioners in primary care and agencies responsible for the provision of social services, and the workers in the Tele-

accompany call centre (33 observations). Observations were supplemented by secondary data comprising project reports and evaluations conducted by partners via a range of usability methods including user workshops/labs (4), and anonymised computer-generated interaction logfile data (over the implementation period of 6 months) to assess user acceptance of the prototype system during the pilot. In addition, we conducted a series of face to face interviews (10) and focus groups (4) (audio recorded and transcribed) with purposively selected participating members of the professional and voluntary care community and the older people throughout the project.

Through these activities we were able to gain insight into the roles and inter-relationships of key stakeholder groups such as the local municipality, health and social care providers, clinicians, social workers, voluntary associations, families, carers, and older people. The research was underpinned by an interpretative approach to studying information system development and use, which broadly prioritises meanings and sensemaking, rather than counting and classifying phenomena, in order to inform, enact and reflect upon the influence of project actors (Walsham, 1996).

In our role as academic partners, we met as a team at regular intervals to go through a continuing cycle of checking, exploring and annotating data from observational field notes, project documents, and transcripts of interviews and focus groups. Analysis was guided by the thematic framework approach to applied, qualitative social research (Ritchie and Lewis, 2003). Applying this approach enabled us to take account of *a priori* issues (for example, user understandings of telecare) as well as unanticipated issues encountered during the fieldwork, most notably the range and variety of 'work' that made telecare possible. Emerging findings were shared by the university team in regular meetings with other project partners for refinement and validation within the work packages for which we were responsible as part of delivering the funded project.

Results: Unpacking the (re-)distribution of the work of care

The main focus of the *ITP* design work was the technical development and deployment of the telecare platform through a staged process. This involved platform system design, procurement of technical devices, testing software, proto-type deployment and finally evaluation of the system in the homes of older people. These stages were underpinned by a techno-centric logic, albeit tempered by a commitment to undertake the development process in a 'user-centred' way (McLoughlin et al., 2009; Wilson et al. 2012). Indeed, we saw one of our roles as academic partners to support this latter commitment by acting, as far as the pragmatics and *realpolitik* of the project would allow, as advocates for a process of co-design based on socio-technical design principles. In practice, we were repeatedly confronted with a tendency on the part of the technology and other partners to want to engage in only limited consideration of the socio-technical dimensions of the work of the project. A short extract from research field notes on observation of one of the early project technical development meetings serves to illustrate this point:

Long discussion of whether or not older people will be able to use the health monitoring device. One technical developer suggested that this conversation need not be pursued further because a 'voluntary sector person will do it' [ie help the older person use the device]. A colleague continued, 'this is an organisational problem out of the competence of this table'. Participants seemed satisfied with this explanation and the group returned to technical discussion.

The predominant technology-centric approach had two implications for the way the project developed. Firstly, the proposed 'architecture' of the platform and associated services was primarily concerned with the formal inter-relationships between functional elements and components of the platform and their connectivity. The social and organisational context in which these technical aspects of the system were to be both developed and deployed was given scant and incomplete representation. At best, such social and organisational elements were shown as relatively peripheral and certainly incomplete in their conceptualisation compared to the messy reality of the care of

older people in context. Secondly, the planning of the project and the key milestones involved were dictated by the aim of evaluating a list of clinical technologies/devices, hardware and software to be developed, which could be subsequently deployed within older people's domestic environments. The predominance of these factors was inevitably to have a strong influence on the way both the Tele-accompany and tele-medicine pilots developed.

Development of the Tele-accompany pilot

As we have indicated above, the project built upon an existing Tele-accompany service in which care for older people was delivered remotely, mediated by technology in the form of the standard telephone. *ITP* prototyped a set of social networking entertainment services featuring content such as community produced 'radio' programmes for older people based on and extending the existing telephone based trial service. Figure 2 shows the high-level relationships between the various components, technical devices, organisations, and roles.

INSERT FIGURE 2 HERE

In order to understand the perspective of various stakeholders, our work in the project began by observing and interviewing the existing Tele-accompany social workers. These workers emphasized their pride regarding the contribution they made to supporting older people to remain in their own homes. During the interviews and at other points in the project they related occasions when they felt that the service had demonstrated a significant role in supporting other service providers and the deployment of service resources. For example, in certain periods of very hot weather they reported having a powerful role in being able to mobilise support to go to the aid of older people: "we really feel we have some power to help the older people at those times" (Tele-accompany worker).

Although social workers who operated the Tele-accompany service were not organised in such a way to establish exclusive one-to-one relationships with the clients the relatively small number of Tele-accompany social workers and the limited cohort of older people meant that aspects of such relationships had emerged. There was evidence from our observations of the call centre of the blurring of professional and interpersonal relationships, and indeed of effort on the part of the social workers that went beyond the formal interaction over the telephone. For example, their desks were surrounded by pictures sent in by clients of their pets and grandchildren. They told us of clients visiting the call centre with gifts such as homemade cakes for the workers. One of the social workers explained, "we are ... collecting their recipes for publication and this is preserving some of their knowledge and experience".

The Tele-accompany social workers felt that their relationship with the older people was familial. According to them, many clients looked forward to the calls and the calls had therapeutic value. As one worker said, "If they are feeling sad they call us and that helps them and cheers them up. It is very important for them." They also stressed the importance of keeping this key element of human contact as a central principle and were of the view that technology should not be used to replace human contact but to support and augment it. The social workers' team leader was not initially part of the *ITP*, but the project team invited her to inform the development process as the potential implications for personal relationships with older people became more obvious. She became an important champion for the project, which she saw as potentially bringing the benefits of the pre-existing Tele-accompany service to many more older people in need of health monitoring, support, and companionship.

The *ITP* was strongly associated from the inception with a local political vision of increased participation by the city's voluntary associations in the care of its older people. The city's third sector voluntary associations were therefore potentially key stakeholders. Indeed, one perceived benefit of enhancing the existing Tele-accompany service was that this might enable the better harnessing of the capacity of the third sector. For example, parish and community centres already played a

significant role in the care of older people. These operated under the auspices of one of two social institutions with a longstanding and dominant positions in the municipality, the Catholic Church and the Communist Party. The centres typically provided facilities such as bars and recreation facilities, reading and TV rooms, and ran exercise classes, leisure activities and social events. They received some funding from the municipality but were autonomous and largely run by volunteers who were often older people themselves.

As the project progressed, it became clear the role of stakeholders such as voluntary associations, who had no formal role within the project should be explored in more depth, not least, as they were implicated in the production of content. People within the third sector became more and more interested in the telecare system. This was evidenced in a series of focus groups. Members of voluntary associations saw the telecare system as offering a means by which older people might be brought together and the problem of those living alone in isolation managed. As one explained, “because they don’t want to bother their children, they prefer to go to the association’s centres...It helps them overcome isolation”. For example, a representative of one of the associations explained that he was convinced that such technologies were essential for improving the lives of the elderly, both those who live alone and those who do not. He explained: “Lots of elderly persons have homes on the third floor without a lift, and because they cannot go out ... a programme of this kind [pointing to the computer] is therefore very interesting for the elderly” (Focus Group transcript, authors’ translation).

The delivery of a stable hardware platform for the domestic installation stalled when the first three installations outside of the laboratory were seen to fail. This set-back threatened to undermine the project. Voluntary association members, however, encouraged older people to continue to be involved despite delays and rescheduling. In this way, active support from the associations created a vital bridge between the internal project focused world of technical products and services, and the wider social and organisational world of the care system for older people in the municipality.

Some older users in the Tele-accompany pilot who had access to the system for a few months reported in a focus group that they enjoyed the content, especially content generated by other users, but that it was the human contact they valued most. They typically liked to access Tele-accompany alongside trusted individuals who could be carers, relatives, or members of the voluntary associations who acted as mediators of the new information sources. A few, in contrast, said that they felt proud about becoming able to use the system to seek out information without asking members of their family for help. Some very keen older users intended to take on new tasks such as creating content on the system by uploading information, for example concerning association events. One who had become particularly enthusiastic about the system and its possibilities intended to teach others. These users had stuck with the project despite numerous technical disruptions. The Tele-accompany team leader commented that in her view they had become ‘experimenters’ who were willing to go on a long, often frustrating, journey with the project team.

Development of tele-medicine pilot

The intention of the tele-medicine pilot was to develop a prototype set of integrated technical devices, including domestic scales and electrocardiogram equipment, which would have locally produced and agreed clinical knowledge embedded within them such as clinical thresholds for remote alarm triggers to enable remote monitoring of vital signs and symptoms. The wider context within which these technical components and products were deployed and used was neither recognised nor considered. We represent below in Figure 3 the high-level relationships between the various components of the tele-medicine part of *ITP*.

INSERT FIGURE 3 HERE

The ‘techno-centric’ view was also consistent with the views of the hospital-based clinicians in the project team. They saw the project as a means of developing a low cost monitoring system for older

people, which would provide early indications of potential problems and allow the appropriate professionals to intervene. As such, they assumed it would be deployed in accordance with existing and established clinical roles and responsibilities and would not disrupt these. For example, in the initial project plan it had been assumed that the appropriate professionals to use the system would be general practitioners. However, the clinicians in the project team challenged this; they claimed that, in the municipality, General Practitioners (GPs) primarily worked alone, were not keen on change, and that they would be skeptical of the project's intentions.

As the project progressed, a clinician in one of the partner hospitals, a leading heart specialist, emerged as a champion for the proposed system and actively helped to progress the tele-medicine pilot by nominating patients from his list as participants. He also negotiated with GPs and offered supporting resources to develop the monitoring algorithms. This support was clearly important to the progress of the pilot. However, it was predicated on a particular set of assumptions about the role and purpose of the tele-medicine system and the care relationships it was meant to support. In particular, it was believed that the connection between the tele-medicine elements of the system and the clinician who is responsible must be a direct one. At the same time, only a clinician could make the appropriate interpretations of data generated by the monitoring tools in the system. Although, it was accepted that there was a potential role for intermediation by other approved parties who might be involved in the selection of relevant data for clinical interpretation, this was not a role that was to be extended to existing Tele-accompany call centre social workers and other care providers including older people themselves.

In sum, the development of both pilots illustrates a gap between the technical and social components of the project. In the case of the Tele-accompany pilot this was exacerbated by delays in the technical development of the platform. Paradoxically, this allowed the authors to use their role in the project to explore the social dimensions of the system of care in more detail and the nature of the gap between the proposed technical solution and the need and requirements of those engaged in the care of older people. In the case of the tele-medicine pilot, the extent of the gap was to some extent concealed and in effect bridged by the support of hospital-based clinicians within the project. However, this support came at the price of developing and deploying a system that did not disturb the existing clinical roles and relationships.

Discussion: Making the 'invisible' work visible? Telecare and the (re-) distribution of care work

In this section, we examine these developments through the lens provided by the TSOL framework. This reveals how the emerging design and configuration of the system began implicitly to either preserve or re-shape the distribution of labour across previous boundaries of care. To provide a benchmark, Figure 4 uses the framework to explore the distribution of labour in the care environment as it prevailed at the commencement of the *ITP*. As we noted above, the TSOL framework helps us to recognise the way in which changes in one type or function of labour affects work in other areas (Glucksmann, 1995; Taylor, 2004). For example, family carers assigned new roles and responsibilities in a telecare intervention may or may not be paid, and can be part of the public sector, the private market, or, as in the case discussed above, a voluntary organisation. By the time the project started, the telephone-based trial service had resulted in not only the establishment of a new formal paid role performed by the Tele-accompany social workers, but also an evolution of this role to encompass informal, unscripted and not explicitly remunerated 'familial' interactions. There is also a suggestion of them performing intermediary roles at certain times (for example, during periods of hot weather) with other care professionals, which were not underpinned by any formal protocol or other arrangements.

INSERT FIGURE 4 HERE

Turning to the situation ‘triggered’ by the development of the Tele-accompany system and the tele-medicine system, we observed the beginnings of a further redistribution of work between the paid and unpaid and the formal and informal, which took forms that were not foreseen at the outset or necessarily fully perceived as the project pilots progressed. These can be understood in terms of changes (actual or potential) in the work of transfer of ownership for care between actors and/or agencies (exchange), shifts in the means of moving work between actors and/or agencies (distribution), new work in generating care services and products (production) and new patterns in the work of using services and products (consumption).

Bridging the Tele-accompany gap

Through the TSOL lens, the Tele-accompany part of the care system could be seen as a shift in the locus of the production of care. However, this was not simply from the sphere of formal providers to the home. Rather it involved changes in the ownership of care, for example, between the Tele-accompany social workers and carers located in the community lay/volunteer and unpaid/informal domains. Whilst the design of the telecare platform enabled such a shift in production, the designers did not see it as their concern to understand how this might be given effect through new forms of exchange, and with what implications or consequences. For example, a re-location or re-distribution of care work from the formal to the informal sphere, and from paid to unpaid labour, implies that care relationships become less formal and potentially more personal. However, the delivery of care might be less effective because of this informality. One of the new products made available by the telecare platform - data from the monitoring and care co-ordination of the older people – could, in theory, end up being distributed within a diverse and heterogeneous community. On the one hand, the knowledge and co-ordinating work of production performed by the social workers in the call centre would effectively become redundant, whilst the new data produced by the system could be dispersed and consumed without the appropriate co-ordination and governance.

Within the lifetime of the project, such redistributions were at best embryonic. However, there were some indications from our interviews and the computerised logfile data of the potential for such shifts. For example, these provided evidence of some new on-line interactions between older people, albeit many already knew each other on a face-to-face basis. Moreover, stakeholders across the project landscape were sceptical about the Tele-accompany system becoming a mainstream means of peer-to-peer support. Indeed, one GP observed to us early in the project, “older people in Italy are only interested in two things...God and sex!” implicitly questioning both whether the older people would use or be allowed to use it in such a way (Meeting Fieldnotes). Some Tele-accompany service users were equally dismissive of the value of such communication for building a support network, one suggesting ‘I don’t need new friends’.

However, using data from interviews with the call centre staff and analysis of the computerised logfiles that tracked the older peoples’ use of the tele-medicine service during its trial, we observed evidence of changes in the nature of exchange and consumption. In particular, the work of the call centre workers and volunteers in the formal-unpaid roles within the local associations was crucial in enabling the project to achieve its objectives. Community facilitators and leaders were enthusiastic and highly engaged by tasks such as creating new social content on the Tele-accompany system. In other words, they appeared both willing and able to be involved in the formal production of care services in the new telecare environment.

Bridging the tele-medicine gap

Due to the small numbers of patients involved, the observations we have of the behaviour of the various participants are relatively limited. However, two points were evident. First, as part of the setting up of the tele-medicine component of the system, the secondary care clinicians involved were required to agree and publish a set of evidence based parameters for the thresholds (for example, the triggering of alarms) to be designed into the system. Patients were then trained in the use of the system by a junior doctor dedicated to supporting the project. The ones who agreed to

participate appeared to find the use of the various devices relatively unproblematic. None of the tele-medicine patients engaged with the Tele-accompany services, although these were also available on the system.

Our broad observation concerning this aspect was that the work involved in the production of clinical knowledge could, in principle, be moved from the physical site of the doctor's office, where it was typically undertaken by a nurse or other health worker, to a data collection activity conducted by, or on behalf of, the patient in their own home. The data collected could then be interpreted by a remotely located clinician, supported by an algorithm embedded in the telecare system. However, clinicians involved in the project articulated a strong view that any 'innovation' here would only be seen as appropriate if it was consistent with established clinical roles and relationships.

Nevertheless, in principle, the design of the system had opened-up the possibility for a re-location or re-distribution of elements of care labour from the formal to the informal sphere and from paid to unpaid labour.

In order for the remote asynchronous exchange between the clinical workers and patients to function the collection and interpretation of data in the tele-medicine system needed to become explicit, formalised, highly structured, rendering it de-personalised and de-contextualised. As a result, the consumption of the product of the care work (that is, the various readings from the remote monitoring devices including movement, blood pressure and weight) through the system would become distributed and the asynchronous knowledge of the clinician and clinical domain opened to the patient's own interpretation in the informal private sphere. The patient would as a result be physically separated and unable to directly observe, contribute or question clinical interpretation *in situ*. Oudshoorn (2007) shows from her empirical research that patients are potentially able to make lay interpretations of clinical data. However, such interpretative work on the part of patients is invariably produced and remains within the private/informal sphere and, therefore, has the status of mere lay knowledge and is not admissible as the basis for formal clinical intervention.

In sum, on the one hand, existing powerful actors within the project and the local care environment sought to ensure that the organisation of labour around the proposed system was aligned with existing status distinctions and divisions of clinical labour, which preserved the power and autonomy of clinicians. As a result, they saw any new task requirements, such as analysing new data in advance of clinical interpretation, as being most appropriately accommodated within existing professional relationships. On the other hand, it was also the case that if older people were to become active users of the system and thereby to participate in managing their own health, then further adjustments to the social organisation of labour would be required if this was to have any meaningful consequences from the clinical point of view.

Concluding remarks

The story of the progress of the *ITP* was dominated by two sets of factors. One was the disruption to the project plan due to unforeseen technical issues and delays. The second was an increasing recognition, although not necessarily complete acceptance, as the project unfolded, of how much it depended on introducing telecare innovations in ways that responded to social and cultural constraints and conditions of older people and their networks. This demanded rethinking the initial, more narrowly technical and economic conceptualisation of the project, which had been imagined in terms of the existing formal inter-relationships between functions and components. The project team discovered that it was necessary to enrol the active support of groups and individuals, including call centre workers, voluntary agencies, family carers and older people themselves, in ways not envisaged at the outset.

It is clear that work of design and implementation of a new set of systems - on top of existing emergent sociotechnical infrastructure(s) - is greatly underestimated in healthcare ICT projects

(Wilson et al. 2012, Mcloughlin et al. 2012, Ellingsen et al. 2013, Mcloughlin et al. 2017). The project examined in this article was characterised by full commitment of the municipality to ICT-based support for its older population, dedicated funding resources, strong political support, committed clinical championing, and a mature civil society environment. These are phenomena likely to be present in other locations, albeit in varying forms, levels and configurations. Against this background, the TSOL lens allows the generation of new insights about the processes and relationships of care, thereby providing a basis for improved understanding of the sorts of work required in the implementation of ICT systems in a wide range of contexts.

As ever, there are limitations to our study. Whilst as 'project insiders' we were able to engage with many significant stakeholders within the care environment, senior clinicians, call centre workers, voluntary association members, and older people, it was also the case that this meant some voices were heard more clearly in our research than others. For example, we had limited access to family carers and none to migrant care workers, whose informal, irregular employment within households is an important feature of the Italian family care system. Furthermore, a TSOL analysis of the activities of the various technical staff working directly and indirectly on such projects and their encounters with stakeholders could also be revealing about the ways in which such programmes are produced and consumed. Future research could address those gaps, and utilise the framework to assess how the work of such groups may be better assimilated in telecare based care environments, and the consequences of a failure to do so. Moreover, the TSOL framework has its origins in feminist thought and was concerned with gendered divisions of labour. Gender analysis of telecare work, however, was beyond the scope of this article and again could be foregrounded in future studies.

Notwithstanding such limitations, by adopting the lens offered by the TSOL framework we are able to contribute to the growing, but still limited, body of research that attempts to advance understanding of changes in work and workplaces related to telecare. Our observations from the *ITP* are consistent with analysis of the organizational complexities of information infrastructures in healthcare and the contested re-distribution of work between different professional groups (Ellingsen and Monteiro 2003; Nicolini, 2006). They also align with accounts that emphasise the delegation of effort to patients and family carers (Oudshoorn, 2011; Rogers et al., 2011). These sets of literature are disparate, and TSOL enables a more holistic framework for recognising the diversity of work that is critical for a telecare intervention to function. It does this through granular analysis of the many varieties of ways additional work is generated and the manner in which such work may be distributed.

From a care policy and practice perspective, adoption of the TSOL framework could provide a basis through which those engaged in developing and implementing telecare systems might take fuller account of existing work practices, particularly unpaid and informal work in households and civil society, and its implications for how systems might be better deployed and used. At the very least, it would add another strand to policy discourses, which tend to be focused on demonstrating technical, clinical and economic benefits from telecare rather than the creation of social value for all those implicated in their use. In our view, a broader perspective would inform attempts to more fully align systems with the working realities of all stakeholders, including those whose roles are often overlooked from technical and clinical perspectives (as was initially the case in *ITP*). These are not just problems of policy and practice of care, however. Revealing the roles and responsibilities in this way poses significant questions for the framing of the design of ICTs in such projects. In the light of the widely reported failure of telecare projects to deliver on their anticipated outcomes and become embedded in care practices, we suggest that insights offered by TSOL challenge those involved in the production of telecare services and systems and the programmes that support them. The main challenge is the reconceptualization of such programmes from ones producing specific technologies/services in situ, to ones that create infrastructures (Tilson et al., 2010, McLoughlin et al., 2016). Adopting an infrastructural approach should better support the sociotechnical environments in which the exchanges and distributions of the ongoing work in the constellations of

care of older people are produced and consumed (Wilson et al. 2012, McLoughlin et al. 2012, McLoughlin et al, 2017).

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PAID		
Formal paid employment in public, private or voluntary sector	Informal economic activity	Household/ family work
PUBLIC FORMAL	PUBLIC/PRIVATE FORMAL/ INFORMAL	PRIVATE INFORMAL
UNPAID		
Formal unpaid work in public, private or voluntary sector	Informal unpaid work (e.g. neighbouring)	Private domestic work

Figure 1: Framework of the Total Social Organisation of Labour (TSOL)

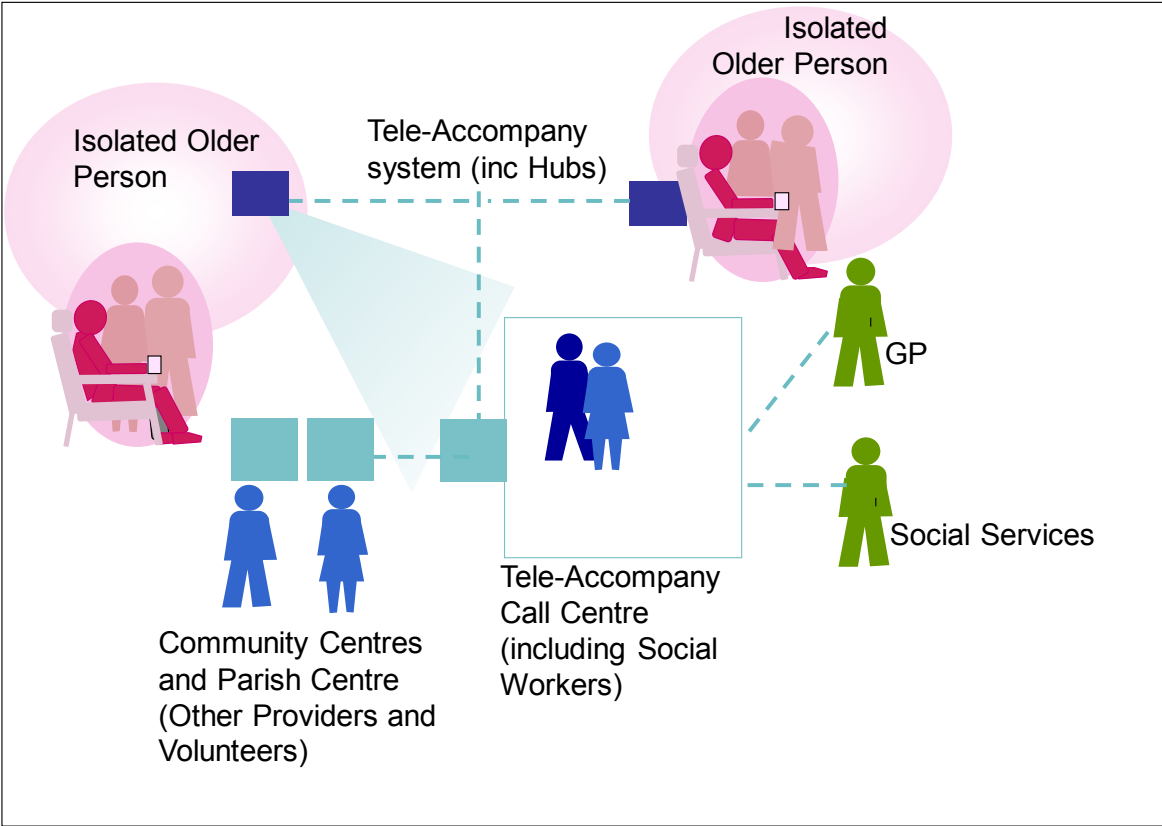


Figure 2: High-Level view of the roles and relationships in the Tele-Accompany sub-project

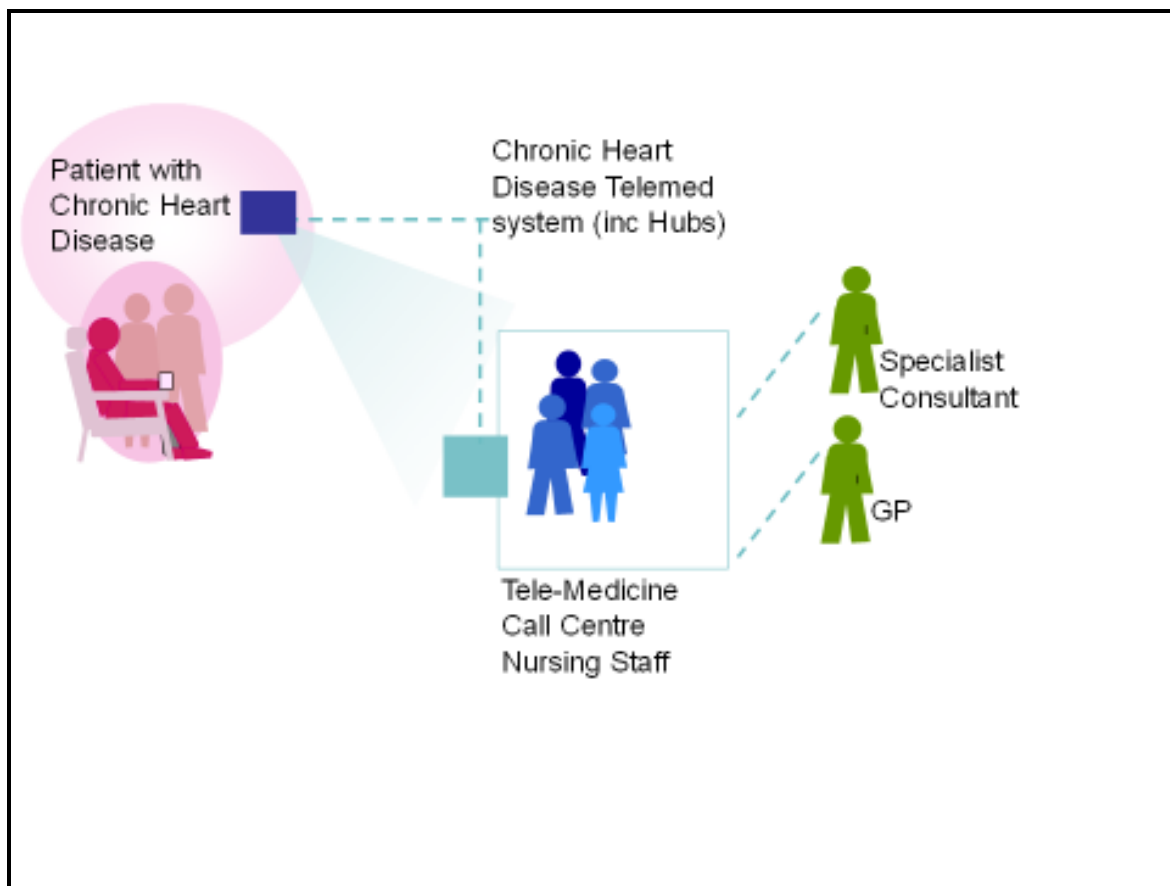


Figure 3: High-Level view of the roles and relationships in the Telemedicine sub-project

PAID		
Formal paid employment in public, private or voluntary sector	Informal economic activity	Household/Family work activity
Medical staff, social workers, tele-accompany call centre workers	Paid workers not registered or taxed (e.g. migrant care workers/ 'badanti' employed by families)	Paid care within the family network
PUBLIC	PUBLIC/PRIVATE	PRIVATE
FORMAL	FORMAL/INFORMAL	INFORMAL
People who give time as volunteers through an organisation (e.g. in the parish and social centres)	Care from people outside the family (e.g. neighbours, tele-accompany workers, doctors who give additional time unpaid)	Self-provisioning within the family or household, (e.g. care for an elderly relative).
Formal unpaid work in public, private or voluntary sector	Informal unpaid work	Private domestic work
UNPAID		

Figure 4: Framework of the Total Social Organisation of Labour (TSOL) applied to an Italian Municipality Telecare project