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# The organising vision for telehealth and telecare: discourse analysis

Trisha Greenhalgh,[1] Rob Procter,[2] Joe Wherton,[1] Paul Sugarhood,[3] Sara Shaw[1]

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[1]Centre for Primary Care and Public Health, Barts and the London School of Medicine and Dentistry, Queen Mary University of London, London, UK
[2]Manchester e-Research Centre, University of Manchester, Manchester, UK
[3]Barts Health NHS Trust, London, UK

**Correspondence to**
Professor Dr Trisha Greenhalgh;
p.greenhalgh@qmul.ac.uk

## ABSTRACT

**Objective:** To (1) map how different stakeholders understand telehealth and telecare technologies and (2) explore the implications for development and implementation of telehealth and telecare services.

**Design:** Discourse analysis.

**Sample:** 68 publications representing diverse perspectives (academic, policy, service, commercial and lay) on telehealth and telecare plus field notes from 10 knowledge-sharing events.

**Method:** Following a familiarisation phase (browsing and informal interviews), we studied a systematic sample of texts in detail. Through repeated close reading, we identified assumptions, metaphors, storylines, scenarios, practices and rhetorical positions. We added successive findings to an emerging picture of the whole.

**Main findings:** Telehealth and telecare technologies featured prominently in texts on chronic illness and ageing. There was no coherent organising vision. Rather, four conflicting discourses were evident and engaged only minimally with one another's arguments. Modernist discourse presented a futuristic utopian vision in which assistive technologies, implemented at scale, would enable society to meet its moral obligations to older people by creating a safe 'smart' home environment where help was always at hand, while generating efficiency savings. Humanist discourse emphasised the uniqueness and moral worth of the individual and tailoring to personal and family context; it considered that technologies were only sometimes fit for purpose and could create as well as solve problems. Political economy discourse envisaged a techno-economic complex of powerful vested interests driving commodification of healthcare and diversion of public funds into private business. Change management discourse recognised the complicatedness of large-scale technology programmes and emphasised good project management and organisational processes.

**Conclusion:** Introduction of telehealth and telecare is hampered because different stakeholders hold different assumptions, values and world views, 'talk past' each other and compete for recognition and resources. If investments in these technologies are to bear fruit, more effective inter-stakeholder dialogue must occur to establish an organising vision that better accommodates competing discourses.

## ARTICLE SUMMARY

### Article focus

- Despite significant research and investment, telehealth and telecare technologies are not widely used and their value is contested.
- We used discourse analysis to study the competing arguments and practices of different stakeholder groups.
- Our research questions were: (1) how do different stakeholders understand telehealth and telecare technologies? and (2) what are the implications for development and implementation of telehealth and telecare services?

### Key messages

- We identified four conflicting but overlapping discourses—modernist (technology-focused, futuristic, utopian), humanist (person-centred, small-scale, grounded in present reality), political economy (critical, cautious) and change management (recognising complicatedness but not conflict)—which engaged only minimally with one another's arguments.
- We suggest that stakeholders in telehealth and telecare projects work towards establishing cross-sector learning communities in which different points of departure, priorities and accountabilities are made explicit and acknowledged.

### Strengths and limitations of this study

- Detailed close reading of texts enabled us to make sense of a complex and heterogeneous academic, policy and lay literature.
- Discourse analysis is not well understood or valued by the mainstream medical community.

## INTRODUCTION

Assisted living technologies comprise the sensors, devices and communication systems that, in combination, support delivery of services to a person in their own home. They include telehealth (remote medical care, treatment or monitoring) and telecare (remote social care services or monitoring), proposed as a solution to the inter-related trends of ageing of the baby boom generation; rising rates of chronic illness and disability;

shortfalls in health system capacity and budgets and shifting social roles and expectations.[1 2] The term 'telehealth' (for which a more detailed definition might be technology-supported medical or nursing tasks undertaken in a person's home or other remote site, especially sending biometric data from the patient to the healthcare system and/or sending advice, instructions or reminders from the healthcare system to the patient) should be distinguished from 'telemedicine', which conventionally refers to technology-supported links between different parts of the healthcare system (eg, between a general practice and a hospital), and is not covered in this paper. In the UK, *telehealth* technologies are usually linked with the public or private healthcare system, whereas *telecare* technologies, mostly comprising alarms and sensors intended to detect such things as falls, flooding and people who have become lost while wandering, are generally linked with social services. The terms 'telehealth' and 'telecare' are relatively new. Older texts use a wide range of terms, some of which would now be considered insensitive or politically incorrect (eg, 'aids for the handicapped'), and the broader term 'gerontechnology' was introduced recently to refer to telehealth, telecare, mobility aids, lifts and other communicative and assistive technologies when used by (or offered to) older people.[3]

Despite the espoused potential of telehealth and telecare technologies to enable people to 'age in place' (ie, avoid or defer institutional care in later life and remain active participants in society), benefits achieved to date have been modest.[4] This is partly because exploration of the personal, organisational, cultural, ethical and legal implications of telehealth and telecare has lagged significantly behind technology development.[5–9]

Yet interest and investment from industry, government and research sponsors remain high. In the UK, for example, the government-funded Technology Strategy Board allocated £25 million to assisted living technology development, most of which was contingent on matched industry funding, between 2008 and 2011. Research and development increasingly involves large-scale, multipartner inter-sectoral partnerships such as DALLAS (Delivering Assisted Living Lifestyles at Scale, a £23 million partnership between the Technology Strategy Board and government departments, launched in June 2011) and the '3 million lives campaign', an agreement between government and industry to create an enabling infrastructure for assistive technologies in the UK public sector (http://www.3millionlives.co.uk/).

These UK examples, which are mirrored in many other countries, illustrate the multiple stakeholders involved in telehealth and telecare, including government, policymakers, the technology industry (who operate as businesses), researchers (who bring preferred theoretical and methodological approaches and standards), health and social care professionals (who may have a view on what 'good' care consists of), and managers (who may operate within particular metrics of efficiency), third-sector organisations (such as patient and carer support groups and charities), citizens (who may have a view on how their taxes are spent) and the people who use telehealth and telecare technologies or choose not to use them. The process of developing, disseminating, implementing and using telehealth and telecare technologies requires coordination between numerous individuals and organisations, each of whom must commit to making a personal, professional or financial investment in the technologies and the work involved in their use.

Programmes whose aim is to introduce a new technology must create a vision of what life will be like when uptake has reached the hoped-for levels, generate positive expectations and mobilise stakeholder efforts to develop and disseminate it. As the pace of technological progress in medicine quickens, 'regimes of truth' (what people know or claim to know) may give way to 'regimes of hope' (in which lack of hard evidence that a technology works—or even exists—is reframed as evidence that investment needs to increase).[10]

Technologies introduced into organisations are open to different interpretations. Different staff in organisations frame technology differently, for example, engineers typically view technologies as tools for undertaking particular tasks; managers view them as instruments for achieving business goals.[11] Sense-making—in which members negotiate the meaning of the technology, how it should or might be used and what benefits and hazards it could bring—is crucial for successful implementation.[12] A related concept at societal level is that of the 'organising vision': 'a focal community idea for the application of information technology … that embeds and utilises information technology in organisational structures and processes' (p. 460).[13] A flawed or inconsistent organising vision may explain why technologies that show initial promise subsequently fail to enter widespread use.

In this study, undertaken as background to an empirical research study on assisted living needs in, and technology design for, older people, we sought to map the stakeholders and identify the discourses that contributed to the organising vision for telehealth and telecare technologies. Our research questions were: 'how do different stakeholders understand telehealth and telecare technologies and what do they envision will be achieved with them?' and 'what are the implications of these different understandings for the development and implementation of telehealth and telecare services?'

## METHODS

The ATHENE (Assistive Technologies for Healthy Living in Elders: Needs Assessment by Ethnography) study was funded by the Technology Strategy Board under its Assisted Living Innovation Platform call. The steering group included a lay chair and representation from industry, NHS, social care, technology users and academics. Ethical approval was granted by Queen Mary

University of London Research Ethics Committee (QMREC2011/38) in June 2011 and Bromley NHS Research Ethics Committee (11/LO/0737) in July 2011.

## Theoretical position: organising vision as discourse

We adopted Swanson and Ramiller's notion of organising vision, as comprising metaphors, buzzwords, imagined scenarios and related framings, and centring around widely (though not necessarily universally) acknowledged problems and issues.[13] The organising vision serves three functions for those seeking to introduce and 'roll out' a new technology: (1) interpretation (a shared notion of what the technology is and how it could be used); (2) legitimation (a shared rationale for why the technology should be adopted and used) and (3) mobilisation (activating and coordinating stakeholders to promote adoption and diffusion). An organising vision must be informative (clear about what the technology is and what it might do), plausible (free of exaggerated or misplaced claims about the expected outcomes of adoption), convey a sense of importance (about the value of the technology) and present the technology as distinctive (offering something new over existing products and practices).[14]

While the organising vision for most commercially available technologies resides within a single industry (designers, suppliers, vendors and so on), the vision for healthcare technologies must embrace a much wider community of stakeholders with differing values and perspectives, including industry, government, third-sector organisations, health professions, patients and carers, researchers and research sponsors.[15 16] Their various spoken, written and enacted communications frame and present the arguments through which different stakeholders engage with one another (and/or the arguments by which they dismiss one another and fail to engage effectively). We considered such communications to be broadly equivalent to one definition of discourses: 'ensemble[s] of ideas, concepts and categories through which meaning is given to social and physical phenomena, and […] produced and reproduced through an identifiable set of practices' (page 67).[17]

Discourse analysis is a well-established technique in qualitative research; its principles are explained in two introductory articles.[18 19] Discourse refers to both spoken and written forms of communication. It is revealed by studying both written documents and a wider set of 'texts' including oral speech, speech acts (performances), pictures, symbols and artefacts such as software. An idea or frame of reference may be conveyed by texts through literary devices such as metaphor, imagery, symbols, graphs and through structuring devices such as tabulation, listing, footnotes and so on. Discourse analysis requires a judicious balance between teasing out the broad overarching storylines within which 'facts' are presented ('macro-' or 'big D' Discourses) and undertaking detailed micro-analysis of particular texts ('micro-' or 'little d' discourses), while recognising the reciprocal relationship between these two levels.[20]

## Methods

The method is summarised in box 1. In this analysis, we were interested mainly in the macro-level discourses that contribute to the organising vision. To identify these, we followed the basic principles of discourse analysis,[19] supplemented by selected (macro-level) elements of Hajer's argumentative discourse analysis.[17] To gain familiarity with the topic area, we browsed a range of literature and other sources (eg, websites), attended orientation events and held five informal open-ended (helicopter) interviews with fellow academics, industry contacts and front-line clinicians. We then sought a maximum variety sample of documentary sources (listed in online appendix) covering research, policy, industry, third sector, health and social care, knowledge brokers (including management consultants and think tanks), business and lay media and technology users. We asked our steering group members and searched electronic databases (Medline, Social Science Citation Index and Google Scholar for academic sources and government websites for policy sources) for 'telehealth', 'telecare', 'assisted living technologies' and 'assistive technologies', then pursued reference lists and hyperlinks. For health and social care organisations (including third sector), we began with local organisations with whom we were working on the ATHENE project. For media sources, we prospectively captured relevant outputs from national newspapers, television and the internet between August 2011 and April 2012.

From approximately 400 candidate documents (all of which were published since 2000 and most since 2009), we selected our final sample of 68 (10 from 2002 to 2008 and the rest post-2009) using the following prioritising criteria:

**Box 1** Methodological approach, adapted from other sources[17 19]

### Familiarisation phase

1. Desk research. Reading a broad range of sources including academic papers, lay press, websites, industry publications and so on to produce a 'first reading'.
2. Informal 'helicopter interviews' with five lead informants selected to provide an authoritative overview of the topic.

### Main phase

3. Document analysis. Systematic analysis of a sample of documents for structuring concepts, ideas, categorisations, metaphors and key storylines.
4. Analysis of argumentative exchanges—in this study, conference presentations and audience responses.
5. Interpretation: drawing the above together to produce an account of different discourses, the sites where these are produced and shaped and extent of engagement and argumentation between them.

### Consolidation phase

6. Member checking. Preliminary interpretation is checked for resonance with a sample of informants including representatives of different stakeholder groups.

viewed as authoritative by others in the field (eg, widely cited, personally recommended or having official status); offered a summary and/or overview of the field including a statement of the problem, proposed (technological or other) solution and how people were intended to use the technology(ies); serving at least one key purpose in the organising vision (interpretation, legitimation or mobilisation); typical of other documents in this genre or representing a significant alternative position and recent (post-2009 or, if published before then, still being used as 'current'). We were interested mainly in the prevailing organising vision in this rapidly developing field, and to that end, we prioritised material produced in the last 3 years. But in order to couch current discourses appropriately in historical context, we included strategy documents published before that date and still being used as 'current'.

Between September 2011 and April 2012, we attended 10 knowledge-sharing events (conferences, workshops), sampled for maximum variety in terms of size, lead sector (public or private), intended audience, goals and stage (launch event, mid-stage or post-project dissemination). We made field notes and collected documentation (eg, marketing materials, abstract books, proceedings), following the approach developed by Allen (who used ethnography at meetings and conferences to surface the underlying assumptions, values and key arguments in an interdisciplinary community of researchers).[21]

### Data analysis

To analyse our documents and field notes, we first read and reread each to gain familiarity, flagging sections of text that interested or surprised us. We then reread each text looking for specific material including images, metaphors, scenarios, rhetorical devices (such as association—depicting two concepts as similar or related—and dissociation—depicting two concepts as dissimilar or mutually exclusive), underpinning assumptions (eg, about the safety or reliability of technologies) and overarching storylines. We used spreadsheets to organise excerpts into overarching discourses and (within these) particular themes and categories, drawing on interdisciplinary discussions between research team members whose backgrounds spanned medicine, computer science, psychology, occupational therapy and sociology. In an interpretation and synthesis phase, we drew together findings from this analysis, adding those from successive texts to an emerging picture of the whole using the constant comparative method.[22] We presented a near-final draft of our analysis to 15 people representing all main stakeholder groups and refined this in response to feedback.

## RESULTS

### Description of data set and overview of findings

Our final data set consisted of 78 texts (68 documents and 10 sets of field notes). Documents comprised 22 academic papers (11 empirical and/or theoretical, 11 reviews or commentaries), three guidelines or standards, three local protocols, five European Union and 12 UK policy documents, six lay and four business media articles, five reports from independent consultancies or think tanks, three conference brochures, three industry brochures and two patient organisation 'factsheets'. Field notes covered 10 conferences and other knowledge-sharing events. Of our 78 texts, 58 were from UK, 10 from elsewhere in Europe, nine from North America and one from Australia.

Analysis identified four overarching discourses (summarised in table 1): modernist, humanist, political economy and change management. Modernist discourse, often written in the future tense, depicted high-technology innovations designed by experts as offering reliable, cost-effective and ethically benign solutions to complex clinical and social problems. Humanist discourse focused on individuals and depicted present-day technologies (chiefly alarms and monitoring devices) as potentially disruptive (stigmatising and unwelcome in the home), distantiating (separating people from their families and carers) and disempowering (surveillance as control), and as offering at best a partial solution to the age-related decline of the human body and mind. Political economy discourse depicted telehealth/telecare as a lucrative business market being manipulated by commercial vested interests. Change management discourse depicted adoption, spread and sustainability of these technologies as dependent on good project management and organisational processes. We describe these contrasting discourses in more detail below.

### Modernist discourse: technology as solution, technology user as consumer

The problem for which telehealth and telecare technologies were considered to be the solution was expressed thus by one academic review:

> The over burdened health care system will face a worldwide wave of retirees who will live longer, cost more to treat, and demand new goods and services to help them stay healthy, active, and independent. (page 171)[23]

This extract illustrates several features of modernist discourse. The population of older adults was depicted in vague, collective and homogeneous terms ('retirees', 'elders', 'baby boomers'); expanding in an uncontrolled and threatening way ('wave', 'tsunami', 'time-bomb'); and as resource-hungry, demanding and chronically sick (hence in need of preventive input, monitoring and treatment). Their longevity was depicted as a problem rather than a positive marker of health or the success of the healthcare system. The healthcare system, correspondingly, was depicted as operating at near-maximum capacity and in danger of collapse.

Telehealth and telecare technologies were presented as the rational and cost-effective solution to these problems, as tidy, precise, 'in control', (near-) invisible,

**Table 1** Summary of different discourses in telehealth and telecare

| | Modernist | Humanist | Political economy | Change management |
|---|---|---|---|---|
| Philosophical position | Instrumental rationality | Phenomenology | Critical theory | Pragmatism |
| What is considered to be of value? | Efficiency, cost-effectiveness, rational solutions, technological progress, business success | Feelings, experiences, relationships, reciprocities | Emancipation, reduction in oppression/domination | Adoption, assimilation into business-as-usual, sustainability |
| Usual unit of analysis | Technology (product) | Person, technology-in-use | Interest group/conflict situation | Service model, organisational routine |
| Methodological approach | Experimental | Naturalistic | Historical | Naturalistic |
| Preferred research design | Randomised controlled trial (hypothesis-driven, deductive), emphasis on size and scale and production of generalisable truths | Ethnography, in-depth interview, focus group (qualitative, inductive), emphasis on understanding the individual's perspective | Case study (qualitative, inductive), emphasis on surfacing and challenging power struggles | Case study (qualitative or mixed-method, inductive), emphasis on explaining barriers to change |
| What is viewed as 'research evidence'? | Effect size, metrics (eg, mortality rates, admission/readmission rates), 'proof of concept' | Authentic, plausible account of lived experience and the meaning of technology from users' perspective | Contextualised account of power struggles | Contextualised account of change (or lack of change) |
| Assumed characteristics of technologies | Automated, 'smart'/'intelligent', sophisticated (eg, robotic), ubiquitous, seamlessly connected, failure-free, agentic (ie, does things) | Potentially stigmatising or constraining, prone to failure, needing human input to work effectively. May be low-tech for example, recycled everyday objects | Benefits inflated by marketing and commodification by an industry biased towards high-tech, 'innovative' products | Focus on technology-in-use. Hence, same technology will have different utility in different systems and contexts |
| Metaphor for technology development | Developing and implementing technological solutions | User-centred design or redesign | Manipulation of the market | Creating opportunities for system redesign |
| Metaphor for technology use | Deployment, choice, empowerment, compensation for human deficits | Being-in-the-world, technology ready-to-hand | Commodification | Acceptance, adoption |
| Assumption of what people will use telehealth/telecare technologies for | 'Self-monitoring'—sending biometric data to health professionals | Communicating with friends/family, maintaining autonomy, leisure activity | Many people/services will buy these technologies but few will use them | Supporting routines (personal, family, healthcare provider) |
| Metaphor for how technologies are taken up | Business drivers, regulatory levers, innovation value chain, silver market | Creative, adaptive and perhaps heroic human effort | Market domination | Routinisation |

Continued

**Table 1** Continued

| | Modernist | Humanist | Political economy | Change management |
|---|---|---|---|---|
| Assumed consequences of (widespread) use of telehealth/telecare technologies | 'Demographic time bomb' will be contained; healthcare costs will fall; people will be healthier and happier; new markets for assistive products and services will boost the economy | Positive: can support independent living. Negative: may reduce/replace human contact, cause stress, medicalise the life-world, become the 'patient' when they break down | Public funds diverted into private business. Loss of service-sector jobs and traditional services (eg, district nurses). Institutionalised ageism inscribed in technology | Organisational tasks and processes made more efficient; staff time freed up to do other work; health outcomes improved |
| Non-use of telehealth/telecare technologies explained in terms of | Education gap, motivation gap, awareness gap, incentive gap | Uniqueness and complexity of individual circumstances; meaning of technology | Resistance to domination | Individual-, organisational- and sector-level barriers to change |

freestanding, mobile, portable, autonomous and ethically benign. Imaginary future scenarios of the 'smart home' (spacious, clean, connected, safe, watched-over and free of technical or emotional trouble) and digitally empowered older citizen (literate, skilled, technically and socially engaged and with high quality of life despite having illnesses in need of monitoring) were common (see, eg, the Smith family in a 'roadmap' prepared for the European Commission[24]).

'Empowerment' was equated in this discourse with compliant use of telehealth technologies for self-monitoring and education. Through 'persuasive technologies' (defined as 'a computing system, device, or application intentionally designed to change a person's attitude or behaviour in a predetermined way'[23]), medical intervention would be possible at an increasingly earlier stage in the chronic disease process, allowing the person (assumed to be a rational actor) the opportunity to 'choose' a healthier lifestyle.

Technological and human infrastructures were depicted, like the technologies themselves, as ubiquitous, error-free, 'automatic' and always available:

> … electronic sensors or equipment that monitors vital health signs remotely, e.g. in your own home or while on the move. These readings are automatically transmitted to an appropriately trained person who can monitor the health vital signs and make decisions about potential interventions in real time, without the patient needing to attend a clinic (page 4)
> Headline findings, Whole Systems Demonstrator Trial[25]

Modernist discourse sometimes acknowledged material limitations of current technologies, including periodic breakdown, 'clunky' functionality and interoperability and governance challenges, but depicted a time in the near future when such limitations would be overcome. Some texts offered future scenarios of automated 'placeless' data capture occurring without disruption of people's lives or lifestyles.

Modernist discourse anticipated significant reductions in costs as technologies generated various (unspecified) efficiency savings, typically using an eclectic selection of references and conditional language (eg, '(a maximally-saturated assistive technology market) may yield up to around $75 billion annually of savings, or about 5% of the projected $1.7 trillion spent on United States healthcare'[26]).

Telehealth and telecare technologies were depicted as a business opportunity, fuelled by a lucrative 'silver pound/dollar'. Moral worth was located in the technological and business sphere, aligned with innovation, financial and technical efficiency and clinical effectiveness. Modernist discourse tended to equate 'ageing well' with becoming adept in the use of technologies, while depicting human contact between professional carers and vulnerable older people as unnecessary, inefficient and wasteful of resources (technologies were seen as 'saving' resources by reducing contact time). Technology

development was framed as a design-as-engineering challenge, undertaken by specialists in a setting removed from front-line healthcare or the lived experience of illness.

In modernist discourse, agency was sited in the technology itself (eg, 'The devices gather health information'). Technology users were depicted as consumers of technological products, passively accepting of whatever technologies were provided, skilled (and/or willing to develop skills) in how to use them, gaining enhanced health status and social experience (telepresence) from them and having only positive emotions towards them:

> Ms EW, 64, a retired technologist who keeps a laptop on her dining room table near a crocheted doily and a scented candle, often uses the [video chat] service to drink her morning coffee with one of several friends who live in the same town.
> New York Times feature article[27]

Delays or barriers in the adoption of telehealth or telecare were explained in terms of a deficiency in the technology user, who was described as 'resisting' or 'unengaged'; the solution to this was framed in terms of user education or modification to the technology. Negative emotions and interpersonal conflict were either not addressed or presented with a potential technological fix.

A number of elements of modernist discourse helped to construct telehealth and telecare technologies and their use in the home as legitimate (reasonable, ethical and examples of good professional practice, good citizenship and so on). These included medicalisation (ageing is a disease or predisease to be 'monitored' and 'treated'), rationalisation (technologies represent progress towards a more ordered and rational society), risk (the autonomous, unmonitored older person is 'at risk' and 'unsafe'), deficiency (older people lack something that technology can replace), rational choice (people can be persuaded or 'nudged' to use technology for their own good) and empowerment (technology is liberating and provides comfort, quality, convenience and value for money).

A significant component of modernist discourse was mobilisation. For example, the Technology Strategy Board and the European Union both talked of a '4-point plan for mobilisation', which comprised: (1) raise awareness, (2) create the 'right' conditions (eg, remove barriers to free trade), (3) accelerate investment in and take-up of proven solutions and (4) prepare for the future through further research. Technology development was depicted as necessarily progressive, occurring in phases ('prototype', 'beta', 'launch', '1st/2nd/3rd generation'), each phase producing a more sophisticated, more fit-for-purpose and more efficient (but no more expensive) product.[28] This progression was depicted as occurring at speed and accelerating; stakeholders were exhorted to board the train before it left the station or risk getting left behind.

Modernist discourse was particularly apparent at knowledge-sharing events, at which it was enacted as well as written. The focus in most of these events was on showcasing advanced technological 'solutions' (eg, robotic products) that were not yet on the market but were presented as ready to be deployed, typically accompanied by speech acts such as the award of a prize for the most promising innovation. The argumentative work of modernist discourse was achieved at these events partly by the mutually reinforcing activities of stakeholders from different sectors as industry representatives demonstrated their products, academics offered research findings, policymakers launched new documents or themes and journalists asked questions.

Since the problem that telehealth and telecare technologies were intended to solve was considered to be extensive, urgent and rapidly worsening, the solution was depicted, correspondingly, in terms of partnerships between multiple institutional stakeholders (see Introduction section), supported by frequent knowledge-sharing events and 'digital economy hubs'. The preferred research design was the large-scale experiment (to show 'what works'), as exemplified by the £31 million government-funded randomised Whole System Demonstrator trial.[25] National policies and business strategies in the UK were nested in a wider European vision and infrastructure for knowledge and economic growth.[28]

Substantial upfront allocations of resources to build inter-sectoral links and facilitate research and development were justified via a discourse of investment, payback and economies of scale, but potential conflicts of interest between these stakeholders went largely unexamined. The social change predicted by modernist discourse was dramatic, far reaching and technology driven: new technologies would not merely enhance current approaches to supporting people in their homes; they would fundamentally alter them.

### Humanist discourse: technology user as active moral agent

Some texts in our data set, notably academic papers by social scientists[29–33] and patient organisation advice documents[34 35] revealed a very different discourse which contrasted with modernist discourse in five key ways. First, it centred not on technologies but on the lived experience of illness, ageing and disability; the spaces and places where people lived; the care relationships and accountabilities (formal or informal) which supported them and the positive human qualities of technology users. In particular, older people, whether physically disabled or cognitively impaired, were presented as active, resourceful and moral agents who struggled to live meaningful lives, fulfil social obligations (such as not troubling their professional carers or relatives too much) and look after the technologies given or lent to them. They were presented as the subjects rather than the objects of technology design and to that end, research studies typically had participatory

and qualitative designs and studied a small sample of participants in depth.

Second, humanist discourse focused not on an imagined high-technology future but on current low-technology reality—especially on the (fairly limited) range of alarms and monitoring devices available at the time of our study. While technologies were not necessarily depicted negatively (eg, one study showed how people with dementia used mobile phones when out walking,[29] and voluntary sector advice often emphasised benefits of technologies[34 35]), these were seen as offering, at best, partial solutions to the complex challenges of chronic illness, ageing, rejection and various forms of exclusion and isolation. Health and social care staff and users represented in research studies in our sample, typically saw assistive technologies as prone to failure, with limited interoperability, not always fit for purpose, creating as well as solving problems, distracting carers from the human needs of the technology user and becoming the 'patient' as users or carers took on responsibility for maintaining and repairing them.

Third, humanist discourse emphasised symbolic meaning. Qualitative studies that explored participants' reluctance to use alarms and tags found that some people viewed them as intrusive, disempowering, stigmatising, isolating and exposing them to surveillance by relatives and/or the state.[29] Metaphors included medicalisation of the lifeworld and technology as intruder. These texts emphasised that different parts of the home had different social and cultural meaning. The living room, for instance, typically served as a site of social interaction, leisure and public display (of flowers, photographs, trophies and so on); the bedroom was a site of privacy and intimacy. Technologies placed in these spaces acquired altered significance and in turn altered the significance of the spaces. The behaviour of participants who refused to install, turn on or use telehealth or telecare technologies could sometimes be understood in terms of protecting the boundary between the home and the clinic.[30]

Fourth, humanist discourse reframed technology design as a personal and interactive activity, in which the intended user was an equal partner and expert in their own needs and preferences. One group of researchers, for example, described a person with early dementia who still enjoyed jogging but sometimes could not find his way home; designers worked with 'The Runner' to understand and incorporate his values and priorities; the result was a lightweight satellite positioning device in a Velcro-fastened striped armband that conveyed a 'sporty' rather than 'tagged' identity.[31]

Finally, humanist discourse emphasised the delicate and situated balance between benefit (eg, protection) and harm (eg, stigma, intrusion, distantiation). Inscribed in technology, deliberately or inadvertently, are the values, norms, world-views and assumptions of its designers and sponsors, which may include age, gender, class, cultural and other stereotypes. It is a strange form of 'empowerment', for example, that requires an individual to stay at home, undertake bodily rituals several times a day and enter data into a machine for distant processing. Video technology could *increase* social isolation by enabling professional carers and relatives to monitor them at a distance, avoiding getting close to human mess (smells, emotional needs, suffering, interpersonal conflict, body fluids). As the Royal College of Nursing put it, 'Healthcare and nursing practice has traditionally demanded face-to-face contact between patients and professionals. The ethics of remote assessments and treatment have yet to be fully explored'.[36]

### Political economy discourse: the technological–industrial complex

Political economy discourse was articulated mainly though not exclusively by critical academics. It sought to identify and challenge the techno-economic regimes created and perpetuated by vested interests around assisted living technologies.[37] Matheson, for example, draws explicit parallels between the pharmaceutical and medical device industries.[38] He argues that scientific and technological innovation is far from a politically neutral exercise in building a knowledge base. Rather, research and marketing activities combine to produce 'product canons' (master narratives depicting a large growing need and a drug or technology that will meet it) that integrate scientific truth claims and commercial positioning, thereby generating knowledge with implicit commercial functionality.

Texts in political economy discourse challenged the 'efficiency narrative' (ie, the assumption that technology, however expensive, will increase efficiency and hence bring return on investment and progressive cost-savings) put forward by techno-economic regimes. They predicted that the introduction of telehealth and telecare technologies would be a conflict-ridden process occurring at a slow pace since negotiations would be heavily constrained competing vested interests and structures such as organisational boundaries, budgets, professional accountabilities and legal jurisdictions:

> The current climate of strong desire to control healthcare costs, to introduce fundamental reform of NHS commissioning and to support technological solutions together with powerful commercial interests from equipment suppliers and uncertainties about efficacy could well result in expensive and inappropriate implementations being initiated. […] It would be extremely unfortunate if investment in telemedicine is made and schemes developed at the expense of more low-tech interventions that are proven to be effective (in particular, Pulmonary Rehabilitation programmes). (page 18)[39]

A key argument presented within political economy discourse was that the symbolic meanings we give technologies are shaped and constrained by institutional forces and by our awareness (or lack of awareness) of alternatives. Policymakers seduced by the rationalist

appeal of technology may conflate the management of illness (ie, everything a person needs to do in order to live well with a condition) with the much narrower set of tasks linked to the management of *disease* (collection of a more limited data set of biometric data such as blood pressure, weight or peak expiratory flow rate). Few intended users achieve the insight and confidence to recognise and challenge this framing.

Finally, political economy discourse proposed that the techno-economic complex linked to telehealth and telecare technologies reflects a shift away from traditional social values in which healthcare is a public good, and society's duty to the vulnerable is defined in terms of human contact and the logic of care, towards neoliberal values in which healthcare is a commodity and society's duty to the vulnerable is defined in terms of monitoring and instrumental rationality (decision-making). Poverty, poor health and social exclusion have complex determinants which are little if anything to do with the so-called 'digital divide' and which do not have a simple technological or behavioural fix. Far from being a benign transformative force that will produce a healthier, more equal and more cohesive society once the information-poor have been given training and behaviour modification advice, 'assistive' technologies are an invidious form of social control, potentially increasing inequalities by transferring responsibility and workload from the system onto the patient and family. Political economy texts ask, on behalf of the intended user, 'Whose interests does this technology serve?'.[33]

### Change management discourse

Some texts depicted the introduction of telehealth and telecare technologies in terms of change management.[40–44] For example, a monograph by the Kings Fund, an independent think tank which was a partner in the Whole Systems Demonstrator trial, hints at forthcoming trouble as technologies that have been shown to 'work' in generously funded randomised controlled trials encounter real-world issues such as staff motivation and skill base; professional roles and relationships; organisational routines and inter-organisational care pathways and the need for a substantial recurrent budget for purchasing and maintaining technologies.[40]

Such notes of caution have tended to come from senior individuals who were actively involved in implementing telehealth and/or telecare technologies and who had initially positioned themselves within the dominant modernist discourse, but who subsequently sought to explain low uptake, patient or staff resistance or unexpected consequences (eg, hidden costs). This typically required a re-engagement with the 'mess', which technologies had originally been expected to resolve, as this academic paper illustrates:

> the failure of e-health systems to become routinely used within the health services is not necessarily a consequence of design or technological flaws. […] Many factors could be at play: disruption to services, a mismatch between functionalities of the system and work practices, or resistance or even rejection by end-users for reasons including: concerns regarding patient/practitioner relationship, the need to redefine structures, roles and hierarchies, perceived threat to status within the organisation, fear of a lesser role, becoming redundant, etc. (page 301)[45]

Commentators in this discourse continued to view telehealth and telecare technologies as *potentially* beneficial, transformative and cost saving. But in an explicit departure from the technological determinism of modernist discourse, they sought to emphasise that transformation would require a great deal of additional work and to reframe technology as *opportunity for* rather than *driver of* organisational change.

Two research studies in our sample used May's normalisation process theory to frame a series of questions to guide data collection and analysis in a telehealth implementation project: (1) 'what is the (new) work that has to be done?'; (2) 'who does the work?'; (3) 'how does the work get done?' and (4) 'how is the work understood (accounted for)?'.[45 46] Most studies in this literature, however, lacked an explicit theory of change.

While many texts used the term 'complexity', organic metaphors that reflected a complex adaptive system perspective ('co-design', 'evolution', 'dynamic system', 'interdependence') were rare. More commonly, the term was used to depict *complicatedness*, that is, multiple stakeholders and components for which the key challenge was essentially operational: planning, project management, clarity of roles and responsibilities and so on. One management consultancy, in a monograph entitled 'Healthcare without walls', for example, offered a step-by-step approach to developing telehealth services. In one example from an NHS Trust (page 33), they suggest step 1: Identify needs; step 2: Establish buy-in; step 3: Consider which technologies are needed; step 4: consider workforce requirements such as training and change management; step 5: Design evaluation; step 6: plan implementation; step 7: write business case and step 8: Share best practice.[41]

This example illustrates a key difference between political economy and change management discourses. Whereas the former viewed inter-organisational and inter-sectoral conflict as inherent and linked to historical and social forces, the latter anticipated that at some stage in the future (if the correct steps were followed, relationships built, groundwork done, knock-on effects mitigated and so on), they would be resolved. Indeed, change management discourse engaged only superficially with the issue of conflict between stakeholders—presenting it either as a straightforward project management challenge or as a 'difficulty' that was raised but not analysed further.

### How discourses mapped to stakeholders and interacted

While the different stakeholder groups were not entirely homogeneous, it was broadly the case that the four

discourses described above reflected the position of one or more key stakeholders. Modernist discourse largely reflected that of policymakers, the technology industry and researchers from biomedical and health informatics disciplines. In the UK, these three groups frequently came together in government-funded knowledge-sharing events and 'digital economy hubs'. Humanist discourse tended to reflect the perspective of social scientists and related academic disciplines (eg, nursing); these stakeholders were represented at the large knowledge-sharing events but their work was less prominent and less highly valued (eg, research in the humanist tradition did not feature in keynote presentations or win prizes for 'best innovation'). Political economy discourse was aligned with the position of critical academics and sceptical clinicians and again was a minority voice except at 'fringe' meetings. Change management discourse was articulated mainly by those at the front line of implementation (in particular, management consultancies and think tanks).

The four discourses were readily discernible and distinguishable from one another. However, few individual texts restricted themselves to a single discourse. Rather, most texts reflected one (most commonly, modernist) discourse but, to a greater or lesser extent, acknowledged elements of the other three. With few exceptions, however, different discourses tended to 'talk past one another' in documents (eg, with the minor discourse appearing only in a footnote or a separate subsection) rather than informing and challenging one another in effective interdisciplinary dialogue. Similarly, conferences held to showcase high-technology research often included one or two sessions on 'the user experience', 'change management' or 'cost-effectiveness', but the main presentations were futuristic, technology focused and strikingly divorced from considerations of real-world implementation. In the academic world, modernist discourse dominated health informatics and computer science journals and conferences, while humanist and political economy discourses were sited in the social sciences, with little cross-fertilisation between these.

## DISCUSSION

### Summary of findings

This study, based on argumentative discourse analysis of a diverse sample of 78 texts, has revealed four conflicting but overlapping discourses—modernist (technology-focused, futuristic, utopian), humanist (person-centred, small-scale, grounded in present reality), political economy (critical, cautious) and change management (recognising complicatedness but not conflict)—in relation to telehealth and telecare technologies. As table 1 shows, these discourses differed in their underlying philosophical assumptions, values, perspective on technology, preferred research design, assumed mechanism by which technologies would be taken up and implemented and assumed consequences of this uptake.

### Strengths and limitations of this study

To our knowledge, this study is the first to have applied a discourse lens to telehealth and telecare technologies. Discourse analysis is a broad church, and in this study, we chose to focus almost exclusively on macrolevel discourses. A detailed close reading of texts enabled us to make sense of a complex and heterogeneous academic, policy and lay literature; consider why particular technology projects or research studies were set up as they were and tease out what Hajer called the 'ensemble[s] of ideas, concepts and categories through which meaning is given to social and physical phenomena'.[17] In the ethnographic component, we have also begun to show how the arguments associated with these discourses are 'produced and reproduced through an identifiable set of practices'.[17] The main limitation of the study is, perhaps, that the discourse approach is necessarily subjective (indeed, it 'challenges a traditional, rationalist view of an objectively discoverable social world, instead acknowledging that social worlds are subjectively understood and experienced'[19]) and hence is likely to have limited credibility within the dominant modernist discourse. Our interpretive inductive methodology, whose claim to rigour lies in close reading of texts, reflexivity and discussion among team members, is likely to be questioned by those who value experimental study designs and 'objective' tools and techniques.

### Implications for practice, policy and further research

'Telehealth' and 'telecare' are umbrella terms covering numerous product types from low-tech alarms to high-tech biosensor equipment; hence, it would be simplistic to consider their adoption as a single case. With that caveat, the current gap between policy enthusiasm for telemonitoring and its more limited uptake and impact in practice might be considered as a 'trough of disillusionment'.[46] In order to go beyond this, we suggest that the stakeholders whose contrasting (and sometimes conflicting) concepts and perspectives were revealed in this study need to engage more effectively with one another.

Previous literature on organising vision has begun from the assumption that the introduction of a new technology requires a single, coherent organising vision and that this vision will link and mobilise a relatively narrow range of stakeholders—chiefly the industries who produce and distribute the new technology and the individuals and organisations who purchase and use it.[13] Effectively, a market must be created. As we and others have shown previously in relation to electronic patient records, the stakeholder groups involved in healthcare technologies are not simple 'buyers' and 'sellers'.[15 16] Rather, they have various commercial, political, professional and institutional allegiances; they place different value and moral worth on the use (and non-use) of health-related technologies. The professional values of clinical quality, patient safety and privacy may conflict with the business values of efficiency and return on investment.

Because of these complexities, the notion of 'the' organising vision for healthcare technologies is oversimplistic. The different interest groups described in this paper are likely to continue to exist in an uncomfortable truce with one another, competing for dominance as they gain more or less public appeal, professional credibility, political power, resource and so on. Our findings suggest the hypothesis that the gap between the enthusiasm of policymakers and technologists for telehealth and telecare and their more limited uptake in practice may be at least partially explained by this contested organising vision. While consensus is not a realistic or even desirable goal, surfacing such things as assumptions and values, and inviting debate on their significance through intersectoral and interdisciplinary dialogue will help achieve what systems thinkers have called 'accommodation' (acknowledgement of, and adaptation towards, other perspectives and practices).[47]

We suggest that stakeholders in telehealth and telecare projects and programmes work towards establishing cross-sector learning communities in which different points of departure, priorities and accountabilities are made explicit and acknowledged. Our ongoing ATHENE project aims to help build one such learning community and so make progress towards a broadly coherent organising vision in which these technologies may, where appropriate, become embedded and sustainable.

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## REFERENCES

1. Lewin D, Adshead S, Glennon B, *et al*. *Assisted Living Technologies for Older and Disabled People in 2030: a Final Report to Ofcom*. London: Plum Consulting, 2010.
2. Cohen SA. A review of demographic and infrastructural factors and potential solutions to the physician and nursing Shortage predicted to impact the growing US elderly population. *J Public Health Manag Pract* 2009;15:352–62.
3. Tinker A. Technology and ageing. In: Stuart-Hamilton I, ed, *An Introduction to Gerontology*. London: Sage, 2009:363–88.
4. Vasunilashorn S, Steinman BA, Liebig PS, *et al*. Aging in place: evolution of a research topic whose time has come. *J Aging Res* 2012;2012:120952.
5. Demiris G, Hensel BK. Technologies for an aging society: a systematic review of "smart home" applications. *Yearb Med Inform* 2008;32:33–40.
6. Oudshoorn N. *Who Cares? Telecare Technologies and the Transformation of Healthcare*. London: Routledge, 2010.
7. Percival J, Hanson J. Big brother or brave new world? Telecare and its implications for older people's independence and social inclusion. *Crit Soc Policy* 2009;12:358.
8. Dourish P, Bell G. *Divining a Digital Future: Mess and Mythology in Ubiquitous Computing*. Cambridge, MA: MIT Press, 2011.
9. McCartney M. Show us the evidence for telehealth. *BMJ* 2012;344:e469.
10. Brown N. Shifting tenses—from regimes of truth to regimes of hope? *Configurations* 2007;13:331–55.
11. Orlikowski WJ, Gash DC. Technological frames: making sense of information technology in organizations. *ACM Transactions on Information Systems* 1994;12:174–207.
12. Weick KE. Technology as equivoque: sensemaking in new technologies. In: Goodman PS, Sproull LS, eds. *Technology and Organizations*. San Francisco, CA: Jossey-Bass, 1990:1–44.
13. Swanson EB, Ramiller NC. The organizing vision in information systems innovation. *Organ Sci* 1997;8:458–74.
14. Swanson EB, Ramiller NC. Innovating mindfully with information technology. *Manag Inf Sci Q* 2004;28:553–83.
15. Davidson E, Reardon J. *Organizing Visions for IT Healthcare: Analysis of Discourse Surrounding Electronic Health Records*. Honolulu, Hawaii: Academy of management conference, 2005.
16. Greenhalgh T, Stramer K, Bratan T, *et al*. Adoption and non-adoption of a shared electronic summary record in England: a mixed-method case study. *BMJ* 2010;340:c3111.
17. Hajer M. Doing discourse analysis: coalitions, practices, meaning. In: van den Brink M, Metze T, eds. *Words Matter in Policy and Planning: Discoruse Theory and Method in the Social Sciences*. Utrecht: Netherlands Geographical Studies, 2006:65–75.
18. Hodges BD, Kuper A, Reeves S. Discourse analysis. *BMJ* 2008;337:a879.
19. Shaw SE, Bailey J. Discourse analysis: what is it and why is it relevant to family practice? *Fam Pract* 2009;26:413–19.
20. Gee JP. *An Introduction to Discourse Analysis: Theory And Method*. London: Routledge, 1999.
21. Allen D. Care pathways: an ethnographic description of the field. *Int J Care Pathways* 2009;14:4–9.
22. Glaser BG, Strauss AL. The constant comparative method of qualitative analysis. In: Glaser BG, Strauss AL, eds. *The Discovery of Grounded Theory*. Chicago: Adline, 1967.
23. Chatterjee S, Price A. Healthy living with persuasive technologies: framework, issues, and challenges. *J Am Med Inform Assoc* 2009;16:171–8.
24. Barlow J, Curry R. *Assisted Living Roadmapping Exercise*. London: Technology Strategy Board, 2007.
25. Department of Health. *Whole Systems Demonstrator: Headline Findings December 2011*. London: Stationery Office, 2011.
26. Commission to the European Parliament European Economic and Social Committee and the Committee of the Regions. *Staff Working Paper: Ageing Well In The Information Society*. Brussels: European Union, 2007.
27. Scelfo J. *Video Chat Reshapes Domestic Rituals*. New York Times, 2011. http://www.nytimes.com/2011/12/22/garden/video-chat-reshapes-domestic-rituals.html?pagewanted=2&_r=3
28. Commission to the European Parliament European Economic and Social Committee and the Committee of the Regions. *Ageing Well in the Information Society: An I2010 Initiative. Action Plan on Information and Communication Technologies and Ageing*. Brussels: European Union, 2007. http://europa.eu/legislation_summaries/information_society/strategies/l24292_en.htm
29. Brittain K, Corner L, Robinson L, *et al*. Ageing in place and technologies of place: the lived experience of people with dementia in changing social, physical and technological environments. *Sociol Health Illn* 2010;32:272–87.
30. Oudshoorn N. How places matter: telecare technologies and the changing spatial dimensions of healthcare. *Soc Stud Sci* 2012;42:121–42.
31. Robinson L, Brittain K, Lindsay S, *et al*. Keeping In Touch Everyday (KITE) project: developing assistive technologies with people with dementia and their carers to promote independence. *Int Psychogeriatr* 2009;21:494–502.
32. User-centred multimodal reminders for assistive living. *Proceedings of the 2011 Annual Conference on Human Factors in Computing Systems*. Vancouver, BC, Canada: ACM Digital Library, 2011.
33. Bowes A, Dawson A, Bell D. Ethical implications of lifestyle monitoring data in ageing research. *Information, Communication & Society* 2012;15:5–22.
34. Living Made Easy. *Ethical Issues With Assistive Technology*. Living Made Easy, 2011. http://www.livingmadeeasy.org.uk./scenario.php?csid=43

35. Alzheimer's Society. *Factsheet on Assistive Technology*. Alzheimer's Society, 2011. http://www.alzheimers.org.uk/site/scripts/documents_info.php?documentID=109
36. Royal College of Nursing. *Telehealth and Telecare*. London: RCN, 2012. http://www.rcn.org.uk/development/practice/e-health/telehealth_and_telecare (accessed 6 Feb 2012).
37. Klecun-Dabrowska E. Telehealth in the UK: a critical perspective. *Electronic Journal of Business Research Methods* 2003;2:37–46.
38. Matheson A. Corporate science and the husbandry of scientific and technological knowledge. *Biosocieties* 2008;3:355–82.
39. British Thorcic Society. *Technology Working Party Report and Position Statement on Technology and Respiratory Health*. London: British Thoracis Society, 2012. http://www.brit-thoracic.org.uk/delivery-of-respiratory-care/technology-and-the-provision-of-respiratory-care.aspx
40. Clarke M, Goodwin N. *Sustaining Innovation in Telehealth and Telecare. WSDAN Briefing Paper*. London: WSD Action Network, 2011.
41. Cruickshank J, Beer G, Winpenny E, *et al. Healthcare Without Walls: A Framework For Delivering Telehealth At Scale*. London: 2020health, 2010.
42. Sun H, De Florio V, Gui N, *et al*. Promises and challenges of ambient assisted living systems. *Inf Tech* 2009;2009:1201–7.
43. Anonymous. *Switching on to Telehealth*. 2011. Publicservice.co.uk (Analysis, Opinion, debate) 2011. http://www.publicservice.co.uk/feature_story.asp?id=17763
44. Sarasohn-Kahn J. *The Connected Patient: Charting The Vital Signs Of Remote Health Monitoring*. Oakland, CA: California Healthcare Foundation, 2011.
45. Bouamrane M-M, Osbourne J, Mair F. *Understanding the implementation and integration of remote and tele-health services: an overview of Normalization Process Theory. In: Proceedings of the 5th International Conference on Pervasive Computing Technologies for Healthcare (PervasiveHealth), Dublin, Ireland, 23-26 May 2011*. Piscataway, NJ: IEEE, pp. 300–307.
46. Elwyn G, Hardisty AR, Peirce SC, *et al*. Detecting deterioration in patients with chronic disease using telemonitoring: navigating the 'trough of disillusionment'. *J Eval Clin Pract*. Published Online First: 16 August 2011.
47. Checkland P, Holwell S. *Information, Systems, and Information Systems: Making Sense Of The Field*. Chichester: John Wiley & Sons, 1998.