research article

Accountability and neglect in UK social care innovation

Cian O'Donovan, c.o'donovan@ucl.ac.uk
University College London, UK

Innovation alters who is accountable for social care and how they are held to account. This article shows how organisational, institutional and technological innovation in infrastructures of social care can reconfigure accountability instruments and propel change between distinct modes of accountability. However, innovation also sustains neglect, both in terms of issues, objects and subjects missing from research, and in terms of low levels of institutional reflexivity mobilised to evaluate and direct innovation's impacts. Evidenced using two-level situational analysis – across a UK research portfolio and within a public robotics lab – we argue that confronting this neglect is critical for post-pandemic reform.

Introduction

It is time to 'make permanent the innovations that Covid-19 has accelerated' (Department of Health and Social Care, 2021a: 6). To 'embrace the opportunities of digital' (Local Government Association, 2020: 22). To 'bring all the benefits of innovation back into the [health and care] system' (Department of Health and Social Care, 2021b: 71). As policy professionals promise plans for recovery and reform in social care, innovation is set for a starring role.

This is curious. In line with trends across public policy domains (Pfotenhauer et al, 2019), organisational, institutional and technological innovation have long been drivers of change in what is called 'social care' in the UK and 'long-term care' elsewhere. For instance, beginning in the 1980s, processes of institutional innovation reconfigured post-war social welfare systems around individual choice and market logics – an ideological shift from the universalist values on which they were originally built (Osborne, 1998). The point is this: social care today is already shaped by innovation. If innovation is to benefit pandemic recovery plans, it is essential to understand how

it is already implicated in configuring infrastructures so badly exposed by COVID-19 (Byrd et al, 2021; Comas-Herrera et al, 2021). This knowledge is critical for better structuring accountability in social care so that people who most need care are not neglected before, during or after future crises.

COVID-19 recovery policies have little to say on these matters. However, if they go unaddressed, future innovation policy risks repeating the mistakes of the past precisely when new perspectives on social care are urgently needed (Tronto and Fine, 2022). Addressing these concerns, we ask the following research question: how has public innovation prior to the pandemic sought to reconfigure social care, and with what implications for accountability?

Our argument goes like this: accountability is an emergent feature of the social and material infrastructures that constitute social care. Accountability is influenced by both the composition and the configuration of these infrastructures. Innovation changes what is accounted for because it reconfigures the constitution and logics of these infrastructures. The state plays a part in directing and shaping the underlying logics of innovation, as do private players (Vickers et al, 2017). An arena in which we can follow how these players shape innovation and accountability in social care is public research, which is the analytical focus of this study. We turn to this shortly, but before doing so, we briefly introduce core concepts needed along the way.

Social care is how society orders practices of care and distributes responsibilities and obligations for these practices between markets, the welfare state, the voluntary sector and families (Daly and Lewis, 2000). Social care takes place across a dynamic set of locations and contexts, and a critical obligation in all of them is accountability – a form of relation that demands a response (Tronto, 1993). Accountability directs interest and concern towards how things are, and sustains an ethical duty to ensure that people and things that matter are not neglected (Puig de la Bellacasa, 2011). In these regards, accountability is both evaluative and performative (Ezrahi, 1990; Marres, 2012) – in theory, instruments and structures of accountability reveal the quality or absence of care in order to direct care to those who need it most (Naylor, 2018).

In practice, accountability 'both depends on getting some deep-seated cultural and personal factors, and also on getting some technically complicated things right' (Hudson, 2016: 7). Moreover, determining who it is that is entitled to care is a form of political, ethical and administrative calculus often formalised and enacted through various norms, routines and mechanisms. These *modes* of accountability include: market-based systems of choice, where end-users or insurers exert consumer pressure; direct incentives through managerial control, payment mechanisms or transparency mechanisms designed to ensure minimum standards; professional oversight and control maintained through regulation or professional accreditation; and elections for relevant authorities at the local and national levels (Smith et al, 2012).

Innovation is the practice of developing and implementing new ideas (Freeman and Soete, 1997). It can be understood as a form of conversation between the needs and possibilities of designers, users and society, often contested and always political (Stilgoe, 2019). This is relevant because innovation's benefits do not unfold automatically (Stirling et al, 2018; Haeusermann et al, 2021) and not all consequences of innovation are positive (Mort et al, 2013). Yet, when it comes to innovation policy, more often than not, the focus is on identifying barriers to acceleration (Greenhalgh and Papoutsi, 2019), rather than assessing how innovation is directed and to whose benefit – a pro-innovation bias (Osborne, 1998; Hamblin, 2020). Understanding the *logics* of

innovation – that is, how innovation is imagined and directed towards addressing such issues as the distribution of benefits, costs of implementation or configuring of accountability within infrastructures of social care – is a fundamental challenge in addressing how innovation might, in turn, reconfigure accountability structures.

We conceptualise the people and things that make up social care in terms of infrastructures of care. These are the social, material and technological systems of knowledge, people, relations, rules and resources required to imagine, build, maintain and deliver care practices (Danholt and Langstrup, 2012). They include: the people involved in care, such as professional and unwaged carers, and the people receiving care and their families; their routine activities and the conventions that guide them; the often mundane objects and technologies they use, such as thermometers and medication; emerging technologies, such as digital monitoring devices and the data they produce; and the actual locations and places in which care takes place, as well as their cultures, policy regimes and public values (Langstrup, 2013).

Thinking infrastructurally is useful because it helps us to develop a systematic understanding of the entities, spatialities and temporalities on which care depends (Buse et al, 2018). Take, for instance, evidence showing the increased use of digital services, such as telemedicine, during the early months of the pandemic (Mann et al, 2020). Infrastructural assessment alerts us to the political work that innovation like digitalisation does by reconfiguring the socio-material conditions of hospitals, care homes and people's houses (Weiner and Will, 2018). It also reveals how the diffusion of digital services requires underlying shifts in norms, practices, incentives and routines across locations and institutional settings, from care and data regulators to the insurance industry. It also reminds us that care, like accountability, is not an automatic output of systems, but rather situated within and among their constituent socio–material parts, and dependent on how these parts are configured (Light and Seravalli, 2019).

The article proceeds as follows. In the second section, we further develop our conceptual understanding of accountability in social care infrastructures by introducing empirical examples from the UK. We describe the research design and methodology, and justify the selection of evidence, in the third section, proposing a heuristic for mapping logics of innovation in social care. The heuristic is applied at the level of a research portfolio and research practice, and the results are discussed in the fourth section. In the fifth section, we discuss these findings, noting what innovation in social care neglects. We conclude with implications for theory and policy in England, the UK and internationally.

Accountability in social care infrastructures

How accountability is organised in UK social care

Social care policy and funding allocation in the UK are devolved matters. There is no single policy, funding or service stream that is widely understood as 'long-term care'. Responsibility for policy, legislation, standards and the allocation of funding is devolved to the UK's four nations, and the delivery of services is the responsibility of 152 local authorities in England, 22 in Wales, 32 in Scotland and five in Northern Ireland, separately elected and responsible to their own local populations (Gray and Birrell, 2013).

This article reflects on the political and social context in England (Hall et al, 2020). Social care infrastructures in England and ideas about how best to configure them have evolved over decades in conjunction with broader political currents. Care that is administered

outside of hospitals and surgeries takes place 'in the community' – a singular phrase for what is in reality a patchwork of communities, collectives, firms and charities, around 19,000 'providers' in all (The King's Fund, 2019). Approximately 1.5 million staff, managers, administrators and others are involved in delivering this care (Skills for Care, 2021).

In recent decades, government policies have pursued a logic of institutional innovation directed towards the creation of quasi-markets and followed a healthcare logic of patient choice (Glendinning, 2017; Baxter et al, 2020). However, by the end of 2019, just before the pandemic hit, such resources as finance, knowledge and people's time were insufficiently available across care sectors, and adequate finance was not getting through to where it was needed most (National Audit Office, 2018; Blakeley and Quilter-Pinner, 2019). Whatever the justifications for these logics in the UK, they are not working. One explanation is that the organisation of responsibilities within the English care sector is highly fragmented (Care Quality Commission, 2018). Structures of accountability that would ground responsibilities locally with councils and local authorities are not coupled with adequate flows of finance. State funding is a mishmash of entitlements, needs-based assessments and local arrangements controlling access and levels of provision that are not supported by national commitments to adequate funding and good governance (Ranci and Pavolini, 2013). This purposeful and systemic fragmentation of funding through local government, the National Health Service (NHS) and individuals themselves has led to a significant accountability deficit (Shakespeare et al, 2018).

Specific accountability frameworks and reporting systems in England, the largest of the UK's four nations, have developed through a mix of political expediency, contingency and historical accident, rather than specific top-down design (Smith et al, 2012). Today, they are a patchwork of frameworks and cultures (Hudson, 2016). At the heart of this milieu are a set of shared and dynamic norms and behaviours, intertwined with rewards and sanctions that promote and reinforce collective action (Romzek et al, 2012). We use these concepts as the basis of a heuristic with which to trace: (1) to whom organisations or individuals are answerable; (2) expectations of the accountable organisations' or individuals' performance; and (3) the instruments, frameworks and technologies through which organisations or individuals are held accountable (Romzek et al, 2012: 443).

Using this analytic entry point to trace the impact of innovation in benefit payments, such as personal care budgets, Bracci (2014) identifies three modes of accountability in English social care systems: public administrative accountability, which is hierarchical and applies to situations where there is a public governance enforcement mode; professional accountability, where public bureaucrats become expert groups specialised in delivering complex tasks relevant in the case of technically uncertain problems; and participative accountability, which refers to the role of citizens, customers or voters as receivers of accountability, and emphasises horizontal account giving between publics, public servants and social caregivers.

These modes of accountability can be observed in instrumental frameworks. For instance, the Safeguarding Accountability and Assurance Framework (NHS England and NHS Improvement, 2019) provides public administrative accountability. It seeks to establish designated accountability roles within organisations and establishes minimum standards and a set of legal duties. This is designed to address safeguarding and risk – the dominant concern of accountability in UK health and social care sectors (Gray and Birrell, 2013). This was initially an attempt to broaden 'child protection' to include multi-agency

support for families in need, rather than simply concentrating on investigating incidents of abuse once something bad had happened (Copperman and Brown, 2013).

The Adult Social Care Outcomes Framework (ASCOF) also instrumentalises forms of public administrative accountability. The framework is used by government and others to produce annual reports on instrumental measures of care outputs and outcomes for the care of adults in care homes and residential settings, grouped into four domains: enhancing quality of life; delaying and reducing the need for care and support; ensuring people have a positive experience of care; and safeguarding adults whose circumstances make them vulnerable. The ASCOF aggregates data from a range of different databases and is used by both central government for policy development and monitoring, and local authorities (councils) with adult social services responsibilities (CASSRs) for measuring local performance and for benchmarking against other CASSRs. What tends to be absent, however, are indicators that reflect the quality of life of people receiving and delivering care (Jones and Meyer, 2021), along with an assessment and accountability that can take place close to real time. Also, neglected in the underlying survey data are experiences of people who are excluded from, or not able to access, local authority-funded care services. As a result, ASCOF alone is unlikely to capture the degree of unmet need in communities (John, 2021). Indeed, this is a feature of accountability structures in the UK, which often focus performatively on how well a system is functioning and rather less on assessing needs, monitoring practices, programmes and services, and evaluating interventions and policies (Naylor, 2018; O'Donovan et al, 2021).

Research for innovation has its own accountability framework – the UK Policy Framework for Health and Social Care Research (Health Research Authority, 2017) – which offers guidance to researchers in social care, but it has been designed and has evolved primarily to meet the requirements of research in clinical settings and population health approaches. Despite the prominence of frameworks like these, in reality, they are complemented by a substantial variety of rules, routines and practices across the sector. In tracing the aims of innovation, it is critical to attend to both.

How innovation reconfigures accountability

In reconfiguring spatialities, temporalities and practices of care, innovation changes what is accounted for. For instance, the personal care budgets mentioned in the second section are an innovation that introduced a logic of patient choice (Mol, 2008) into how end-users finance their own care services (Stevens et al, 2014). This innovation cut across institutional and individual scales to reconfigure relationships between end-users, funders and service providers in terms of how finance was distributed and care services were allocated. Although framed in terms of budgets at the individual level, the core innovation was institutional. Via the creation of new markets and eligibility criteria based on self-assessment practices, care recipients were given their own budgets to spend on care services within a market logic. At the same time, accountability structures evolved from duties placed on public administrations to participative obligations based on horizontal account giving between public servants and customers/citizens. Ultimately, responsibility to account for the resources used and the outcomes achieved shifted from service providers and local authorities towards consumers, as did the burden of risk (Bracci, 2014). Yet, a decade later, overall gains made from this innovation remain ambiguous and contested; for some, gains

in personal accountability have come at the cost of increased administrative burdens placed on end-users (O'Donovan, 2021). Also, the governance roles of stakeholders have shifted: local authorities are now charged with shaping and steering markets through commissioning, not simply delivering care.

Innovation also reconfigures infrastructures of care and accountability in more ambiguous ways. Take telecare for instance – an umbrella term for the technologies and services that aim to diagnose, monitor and provide care at a distance (Milligan et al, 2011) and the dominant form of technological innovation in UK adult social care over the past 20 years (Hamblin, 2021). In some circumstances, telecare may result in more frequent and more specialised contacts between nurses and patients, making care practices more effective or more efficient (Pols, 2010). However, telecare innovations are not simply put to use benignly; rather, they are unleashed across infrastructures of care, often affecting care practices in unforeseen ways. For example, they can reinforce certain dependencies that they were supposed to liberate, such as tying older people to life in the home, rather than allowing greater independence from it (Aceros et al, 2015).

Exploring sites of public innovation: innovation project design and practice

Ahead of post-pandemic reform, decision makers may benefit from better understanding this ambiguity. Moreover, understanding the logics of innovation – that is, the aims and direction of innovation, as well as its potential and actual impacts – is important because by reconfiguring infrastructures and by performatively rearranging the facts that are made to matter, innovation shifts who it is that is made accountable, as well as how.

One site where we can explore this ambiguity is public innovation research. Sites of research and design, such as public research projects, offer rich locations to study what Pfotenhauer and Jasanoff (2017) term 'innovation-as-diagnosis', in which a particular innovation cure is prescribed for a diagnosed societal pathology. The implication here is that both diagnosis and cure are shaped by and reinforce pre-existing visions of desirable and undesirable futures in a given society. For instance, Peine et al (2015) show how social care policy objectives are articulated into often contradictory definitions, role models and scripts of techno-scientific infrastructures and objects. They describe how implicit and explicit ideas about later life are operationalised through specific innovation policy goals, such as 'independent living' and 'healthy ageing', and how these, in turn, have been oriented to fit innovation framings, such as grand challenges. These policy goals are not neutral. While they are not straightforwardly deterministic, they do influence who acts and who has agency in innovation processes and reconfigured infrastructures. For example, framings of later life can structure age-related stereotypes of vulnerability and decline, influencing the way people see and imagine possibilities for themselves in turn (Aceros et al, 2015).

The point here is this: how researchers imagine the world matters, not because they have the power to order and configure social and material worlds strictly as they see fit – such change is often deeply contested – but rather because their orientations are a form of often unacknowledged politics that plays out between designers, end-users and those charged with governance and accountability. As such, this study therefore seeks to explore how the logics of innovation and the shared beliefs and collective expectations of policymakers, funders, innovators and sometimes end-users at these

sites constitute ideas about how exactly innovation should reconfigure care and accountability.

Research design, methodology and evidence

To understand how those involved in public innovation research imagine and configure accountability in social care, we operationalise ideas introduced in the second section using situational analysis. Situational analysis is an interpretive, grounded theory approach that offers a materialist constructionism by mapping the social and material phenomena that *make a difference* in a situation (Clarke, 2009). The methodology lets us go beyond highly bounded sociological framings of organisations, institutions and collective action, and allows us to think about ecologies of discourse-based social action, which is well suited to assessing the content and configuration of socio-material infrastructures. Situations are sets of distributed discourses, actions and accomplishments that are produced through the coming together of heterogeneous entities that constitute social care infrastructures, such as people, goals, expectations, rules, knowledge, data, technologies, frameworks and relations. The analytic goal of this study was to specify which of these entities make a difference to the situation of innovation in social care infrastructures from the perspective of the people involved.

Innovation situations are investigated at two scales, using questions assembled in the heuristic as an entry point. To understand how innovation directed by national-level actors configures accountability, we evaluated a portfolio of projects from the UK's largest public research and innovation funder: United Kingdom Research and Innovation (UKRI). UKRI was chosen over other funders, such as the National Institute of Health Research (NIHR), Wellcome and the European Commission, because it is the largest single funder of research, it offers the broadest scope of cross-disciplinary societal domains and is the funder most implicated in the *innovation turn* in public policy discussed in the first section of the article.[1]

Publicly funded innovation research in social care was identified in the UKRI's Gateway to Research database[2] using queries of the form '["social care" AND innovation]', snowballing variants and synonyms until no new and appropriate results were returned. A total of 218 unique research projects were returned. Following iterative review and exclusion, 127 projects funded between 2006 and 2019 were included in the final corpus, which are available in the online supplemental data (O'Donovan, 2020). It should be noted that the search protocol was designed to reveal the projects most likely to correspond to this article's interest in purposeful and impactful innovation in the sector, rather than to comprehensively report all studies that in some way incorporate innovation.

Analysing the corpus, we followed a situational analysis approach for the study of situations using computational data (Marres, 2020). Abstracts for each of the 127 projects were systematically mapped to locate and analyse the discursive arrangements of socio-material infrastructures and associated structures of accountability. Typically, each abstract describes a prospective research situation. This description serves as a promise to carry out certain methods and answer certain research questions, as well as to follow certain innovation logics matching a particular vision of how socio-material care infrastructures are and should be (Jasanoff and Kim, 2015). The discursive arrangements were categorised, and categories were reduced until coherence could no longer be sustained.

To understand how the practices and procedures of innovation on the ground configure accountability, and to test how the practices of innovation might further inform the study beyond the promises made to research funders via project abstracts, we carried out situational analysis at the site of infrastructure development and reconfiguration. A critical case study (Flyvbjerg, 2006) was used to understand participative practices in research on assistive living robotics (ALR). The case was built using non-interventional research – site visits conducted during downtime and interviews conducted with researchers and managerial staff in office settings. Evidence was produced by observing researchers' innovation practices and interviewing researchers, technologists, care home operators and related experts. The case was selected as part of a larger project investigating robotics research in public sector innovation (Michalec et al, 2021), from which we also used evidence from stakeholder workshops with roboticists and scoping reviews of academic and policy literature. These scoping reviews were conducted to identify frames around which innovation policies and activities were justified by policy actors.

In the following section, we report the case-study narrative, in which we tease out: how the participants and organisers of innovation research brought together their preferences, motivations and expectations; where these came from; and what tensions they brought into the situation. The heuristic is summarised in Table 1.

Mapping logics of innovation in social care and exploring implications for accountability

Analysis of the UKRI's portfolio of social care research

Recapitulating, the aim of the article is to understand how public innovation has sought to reconfigure social care infrastructures, drawing implications for how innovation might reconfigure accountability in the sector. In this section, we examine understandings of social care across a portfolio of 127 research projects, map the goals of these projects and then discuss implications for how accountability is structured. Table 2 shows the distribution of the 127 projects across the UK's disciplinary research councils from 2006 to the end of 2019, and the relative distribution of funding on a project basis is illustrated in Figure 1.

Cumulatively costing £111,715,022, the projects range in funding and duration from one-off sandpits, conferences and seminar series, to major £5–8 million investments lasting up to five years, with some centres for doctoral training funded for longer still. The 15 largest projects by funding account for 60 per cent of the total funds. In some projects, social care is the central focus of the proposed research. In others, social care is a sub-domain of a broader scope of inquiry.

Logics of innovation in public research on social care

Situational maps created during the analysis of the corpus revealed four distinct discursive arrangements of innovation in social care, with 111 of 127 project abstracts mapping on to one of the four emergent arrangements. These are outlined in Table 3. The dominant discursive arrangement was that of innovation understood by researchers as improving the distribution of resources, usually led by professionals, and usually, but not exclusively, organised through market arrangements – what we

Table 1: A heuristic to guide the situational analysis of social care innovation

	Probing questions	Sites and situational entities of interest revealed in the review of accountability in UK care infrastructures
The logics of innovation in social care	What problem is innovation being used to solve? What are the practices and procedures of innovation attempting to reconfigure in order to solve these? Who and what is innovation targeted at?	Innovation in personal budgets. Advancements in the use of administrative data. Funding of technological innovation for independent living and healthy ageing. Innovation in caring practices and community organisation.
Mapping the situation: determining modes of accountability	What are the guiding visions and expectations about how social care should function? How do innovation actors think accountability should be structured?	Logics of public administrative accountability, professional accountability and participatory accountability.
Mapping the situation: relevant human entities	Who is deemed accountable, and who makes a difference in an innovation situation? To whom is account rendered, and who makes a difference to this? How is accountability understood in innovation?	Local authority, care manager; professionals, experts; and customers/partners and professionals. Government, supervisors, managers, citizens; peers, supervisors, experts; and customers/partners and professionals.
Mapping the situation: other social and material entities	What experts and expertise matter, and how are they made to matter in accountability structures? What data are important? What frameworks, rules, codes of practice and norms have been established, and by whom? What are the performative roles of infrastructures (For example, what are data foregrounding, and what are they backgrounding? Where are questions of accountability not directed?)	Safeguarding Accountability and Assurance Framework. Role of ASCOF framework. Impacts of shift to personal budgets. Invisibility of older people in care-home data. Invisibility of people who pay for their own care in social care data.
Implications for accountability after innovation	Who decides the innovation logics and research questions? Who benefits from innovation? Does innovation explicitly target governance?	Innovation can reconfigure public administrative accountability through new data schema, data use; shifts in accountability relations between scales, for example, national-level responsibilities shifted to local authorities or communities.

label here as 'improving service provision'. For instance, 'Innovative Technology for Healthcare Delivery – The MIMIT: CIMIT Collaboration' was a 43-month health and social care research project that promised to develop technology for expert users engaged in the delivery of services in Manchester. The primary focus of the project was to 'accelerate the scope and development of new healthcare technologies' (see O'Donovan, 2020: Project 4) and enable users to benefit from care 'faster and more effectively'. Representations of social care closely match the incumbent position found in the government and policy literature discussed earlier, and the stated aim of innovation was to 'optimise' existing services, rather than to reimagine or reinvent them. Innovation in this category is not exclusively technological. Take, for instance, the project 'What Are the Impacts of User Involvement in Health and Social Care Research and How Can They Be Measured?' (see O'Donovan, 2020: Project 12).

Table 2: Distribution of projects and funding in social care research across UK research agencies (2006–19)

Agency	Projects	Funding value (£)
Arts and Humanities Research Council (AHRC)	12	2,379,175
Biotechnology and Biological Sciences Research Council (BBSRC)	1	221,357
Engineering and Physical Sciences Research Council (EPSRC)	27	47,680,830
Economics and Social Research Council (ESRC)	39	31,933,346
Innovate UK	39	26,890,647
Medical Research Council (MRC)	8	4,917,896
Natural Environment Research Council (NERC)	1	726,905

Again, the project researchers understood the aims of social care innovation in terms of provision of services. However, here, innovation activities focused on research infrastructures and practices, and attempted to 'advance understanding of the impact of user involvement in health and social care research'.

The next set of projects were characterised by technology diffusion and maintenance within infrastructures of care – a *techno-deterministic* logic of innovation. Technological innovation is a defining discursive element in this category. Take, for instance, the project 'How Can Smart Home Data and Systems Improve Assisted Living Services' (see O'Donovan, 2020: Project 28). The abstract promised to carry out 'a review of the current situation in the Assisted Living and Smart Home markets and ask key questions about how these could be improved through embracing Internet of Things concepts in terms of data sharing and application development' (O'Donovan, 2020: Project 28). Like this abstract, projects mapping to this category framed technology and innovation as an unquestionable good – challenges of innovation in these projects included increasing acceptability among users and ensuring rapid technology roll-out. Projects funded through the Engineering and Physical Sciences Research Council (EPSRC) and Innovate UK are over-represented in this group compared with the corpus.

A third set of projects sought to *situate and reconfigure knowledge and resources* in social care settings, acknowledging the complex socio-material infrastructural elements of care. Take, for instance, the project 'Therapeutic Placemaking as a Pathway to Improved Public Health' (O'Donovan, 2020: Project 103):

> The Fellowship will enable innovative and collaborative research leadership in regional efforts to improve infrastructures and facilities for health provision in NHS Greater Glasgow. It will embed a 'therapeutic placemaking' approach in the health, public and education sectors, and the architecture and design industry. Additionally, it will engage local community representatives in knowledge exchange, and consultative and evaluative processes around the application of novel therapeutic placemaking interventions.

In this and other projects that we have categorised as *situated*, the driving logic of innovation was to improve the provision of care in markets, as well as the provision of care in community, voluntary and unwaged settings. ESRC and AHRC projects are over-represented here. Interdisciplinary research design and participatory methods that sought to open up innovation procedures to people who were often excluded from research were common among these projects.

Figure 1: Distribution of projects and funding in social care research across UKRI research agencies (2006–19)

Distribution of projects and funding in UK social care research (2006–19)
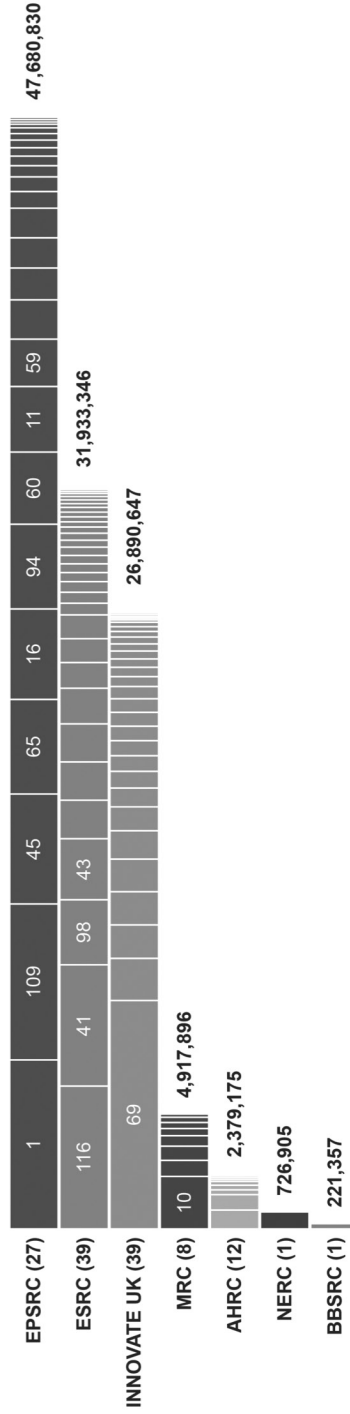
Notes: Numbers in boxes: project codes (for supplemental data, see O'Donovan 2020). Left-hand-side labels: funder (number of projects). Right-hand-side labels: net funding per agency (GB£).

Table 3: Mapping logics of innovation in social care across 127 UKRI project abstracts

Innovation logic	Projects	% of funding
Improving service provision	52	49%
Building techno-deterministic infrastructure	32	23%
Better situating knowledge and resources	23	8%
Building and strengthening human relations	12	3%
Unresolved	8	18%

Interdisciplinary and participatory approaches were also common among innovation projects that we categorised as *relational* in intent. These projects foregrounded the role of human networks and communities in social care innovation. The relatively small number of projects in this category focused on research problems involving (unpaid, informal) carers, the empowerment of social care users and innovating social care practices. For instance, the project 'Buildings in the Making: A Sociological Exploration of Architecture in the Context of Health and Social Care' used ethnographic and design approaches to investigate the way knowledge about health and social care is engineered into buildings designed for care, and how innovation and design can reconfigure relations and caring practices (see O'Donovan, 2020: Project 61). Notably, of the 127 projects analysed, only in one did researchers explicitly state that the goal of innovation was to enhance well-being and cultivate capabilities in carers, rather than in those cared for (see O'Donovan, 2020: Project 30).
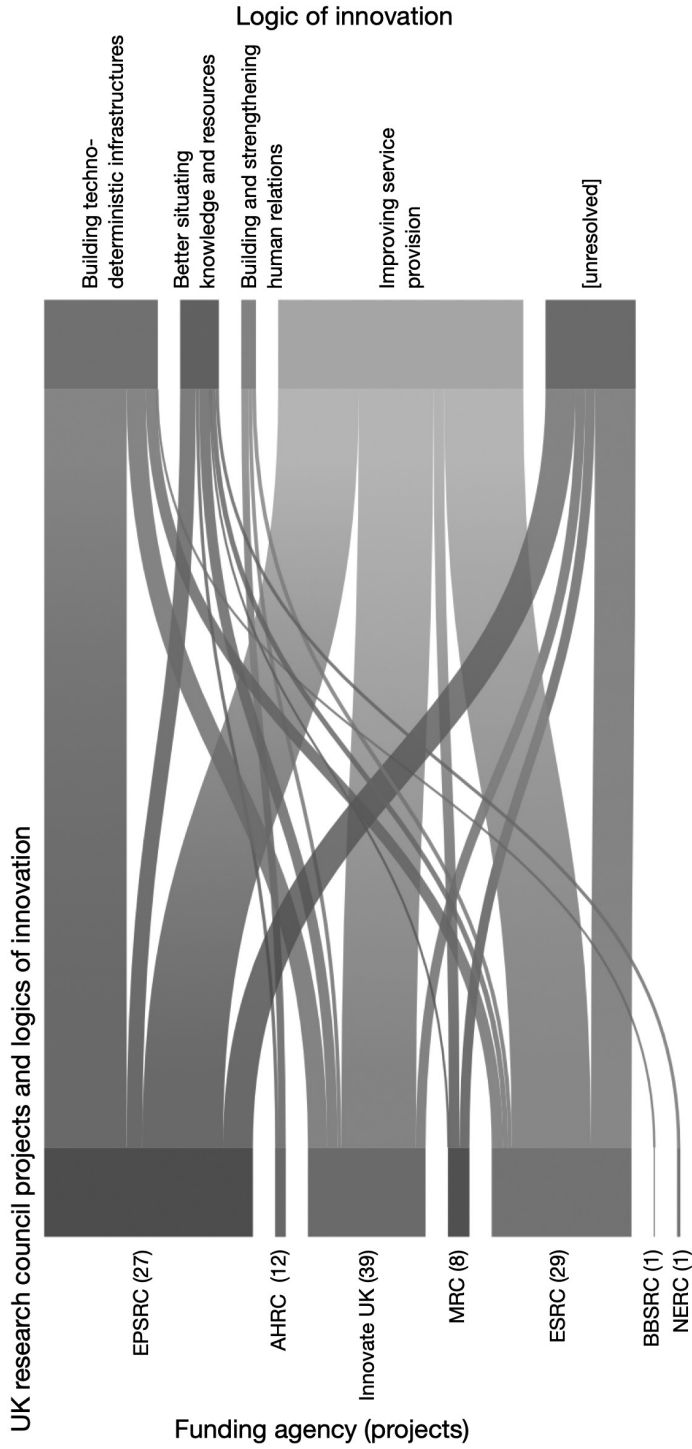
To be clear, these four logics are emergent from the data and remain under-theorised at this point. Some overlap exists – for instance, between techno-deterministic logics and innovation aimed at providing service efficiencies. Nevertheless, they illustrate that considerable diversity exists in the logics of innovation within the overall UKRI portfolio and even within specific disciplinary research councils, as illustrated in Figure 2.

The implications for modes of accountability in social care

None of the projects analysed explicitly aimed to strengthen, change or reconfigure accountability structures in social care. Nevertheless, following the heuristic in Table 1, it was possible to arrive at implications for how innovation might reconfigure accountability in 87 of the 127 projects. Three modes of accountability were identified (see Table 4).

Professional and expert accountability modes were identified in projects in which agency to make substantive decisions about the provision of care was vested in elite political actors, certified professionals and others with expert knowledge. For instance, the £2 million EPSRC-funded project 'Wearable Soft Robotics for Independent Living' (see O'Donovan, 2020: Project 59) aimed to create new technologies and materials that would contribute to service efficiencies in programmes like stroke rehabilitation. In this early-stage development project, critical decisions about the direction of innovation and how success was evaluated were made by expert academic researchers and funders, with no explicit mention of how either procurement managers in local authorities or end-users in the field could ultimately configure accountability.

Figure 2: Mapping UK research council projects (left of figure, weighted by budget allocation) to logics of innovation in social care (right of figure) located within individual project documentation for 127 UKRI research projects

Logic of innovation

Building techno-deterministic infrastructures

Better situating knowledge and resources

Building and strengthening human relations

Improving service provision

[unresolved]

UK research council projects and logics of innovation

EPSRC (27)

AHRC (12)

Innovate UK (39)

MRC (8)

ESRC (29)

BBSRC (1)

NERC (1)

Funding agency (projects)

For 29 projects, the implications for accountability after innovation shifts from residing with expert decision makers to being embedded in *technocratic and public administrative structures*. Take, for instance, innovation projects that promised to enhance care services through advances in data methods and data use (for example, by liberating and connecting data 'stuck' in case notes or legacy administrative systems). Projects like 'Administrative Data Research Centres 2018' (see O'Donovan, 2020: Project 98) and 'Maximising the Use of Existing Administrative Data Sets for Wales through Computer Modelling and Simulation' (see O'Donovan, 2020: Project 20) exemplify this. These projects seek to make use of the very large administrative databases held by central and local governments to, for example, 'explore the interactions between health and social care and the implications of informal care for service delivery for older people' (see O'Donovan, 2020: Project 98), benefitting in the first instance the departments, services and data managers supplying administrative data, with accountability structures remaining embedded in already-existing infrastructures.

For 18 projects, innovation had implications for modes of *collective accountability*, where accountability was emergent from participative practices and collective action. For instance, innovation in these projects sought to: co-produce care services with people usually excluded from innovation processes (see O'Donovan, 2020: Projects 33, 25); establish convivial relations among communities and infrastructures (see O'Donovan, 2020: Projects 89, 103, 104, 118); empower individuals through user-centred understandings of their environment (see O'Donovan, 2020: Project 75); and build human capabilities (see O'Donovan, 2020: Projects 14, 25, 105).

Some overlap between categories was observed, particularly between *professional and expert accountability* and *technocratic* modes. In both categories, accountability and decision-making power tended to be limited to select actors and networks. Conversely, although relatively marginal in the corpus, *collective* modes featured the broadening out of participation in care practices and situated accountability and responsibility at multiple levels of governance, including at local and community levels. In 32 research projects, it was not possible to classify understandings of proposed or existing accountability structures. In some cases, it may have been that this was not considered by researchers; in others, the space available to document the project may have been insufficient. Regardless, this absence is notable; after all, in recent years, research councils have made some efforts to address such issues as responsibility in innovation, of which accountability is a major component.

Analysis of practices of public innovation research at the research project level: a case of innovation in an ALR lab

What implications does innovation have for accountability when we look at the level of research activities and practices on the ground? The following vignette of robotics innovation illustrates further complexities to consider.

The diffusion of robotics and autonomous systems into social care sectors has been promoted by research funders in the UK and Europe (Khaksar et al, 2016; Parliamentary Office of Science & Technology, 2018) and, for instance, includes Projects 59, 72, 73, 74, 78, 81 and 92 in our UKRI data set (see O'Donovan, 2020). At the level of national policy and funding portfolios, a discursive framing of crisis was driving this research even before the COVID-19 pandemic. Ageing populations, insufficient finance in health and social care budgets, and, recently in the UK, a

Table 4: Implications for how innovation in social care structures accountability across 127 UKRI project abstracts

Mode of accountability	Projects	% of funding
Professional and expert decision makers	42	39%
Technocratic and public administrative structures	29	25%
Participatory and collective obligations	21	7%
Unresolved	35	28%

shortage of low-cost healthcare workers unwilling or unable to come and look after Britain's elderly following Brexit are all presented at the level of innovation policy as rationales for urgent innovation (Prescott and Caleb-Solly, 2017). However, the story on the ground is more complex.

Take innovation in ALR – a set of technologies that has received funding support for use in averting people's early move into more institutionalised or acute care (Gallistl and Wanka, 2019). ALR research involves understanding how people and robots can interact 'intuitively, safely and effectively' (Caleb-Solly, 2016) and combines mechanisms of behaviour modification, human robotics interfaces, surveillance technologies and data analysis, such as machine-learning techniques.

ALR researchers face a set of general challenges in integrating these complex technologies into even more complex socio-material infrastructures of social care. Some of these challenges are technical – such as the limited abilities of robots and algorithms to interpret unforeseen situations and complex dynamic environments like care homes (Buhalis and Darcy, 2010). Other challenges are social. Challenges relating to the complexity of the care-related needs of people make it difficult for assistive technology to stay useful as people's needs change over time. Moreover, socio-economic challenges, such as social isolation, ill health and poverty (Age UK, 2019), mean that people who most need assistance are among those least likely to gain access to research, design and testing environments.

The implications of these challenges for accountability are twofold: first, design processes that neglect the needs, wants and values of care users and staff risk diminishing accountability and further marginalising vulnerable people (Spanakis et al, 2016); and, second, it is often easier to adapt people's routines, practices and environments to robots than to design robots to adapt to their application domains (Miller et al, 2020) – especially as regards some older or disabled people with relatively low agency in innovation procedures. Due to this, robotics researchers have a tendency to objectify the very people that are being cared for, thereby risking the diminishing of some accountability relations entirely (Sharkey and Sharkey, 2012).

Addressing some of these challenges, in a presentation to the European Robotics Forum in Malaga, Spain, in March 2020, Robotics Professor Praminda Caleb-Solly at the Bristol Robotics Laboratory (BRL) explains that the goal of ALR for her and her colleagues is to enhance people's well-being across a range of dimensions, to 'address unmet social needs, to add value, and to bring joy' to receivers of care, their families and staff (Caleb-Solly, 2020). They aim to embrace contingency and context and broaden-out participation in the procedures of innovation to people usually excluded (Michalec et al, 2021). These aims also explicitly recognise and address the limitations of deterministic understandings of innovation prevalent in robotics through three strategies.

First, they use co-creation methods that foreground participation and two-way learning between designers and end-users in the innovation of ALR for therapy (Winkle et al, 2019a; 2019b). A second set of strategies revolve around research infrastructures like open living labs designed to enrol end-users and robotics in test beds that mimic, for instance, the real-life environment of an apartment (Ballon et al, 2005; O'Donovan, 2021; Cuevas-Garcia and O'Donovan, 2022). The idea is that by testing robots with their interlocutors in realistic settings, robots will be more likely to meet ethical and cultural criteria as decided by care receivers and caregivers.

A third set of strategies involves leaving the lab entirely. To militate against broader structural challenges, such as the difficulty of involving poorer and more vulnerable users in social care innovation, researchers are trialling new ways to work with community organisations and city councils. For instance, a project funded by Innovate UK has built a living lab test bed inside a nearby extra-care housing scheme. This is designed to develop 'working expertise of smart living technologies … with the aim of improving service provision and upskilling staff' within the partner care organisation (O'Donovan, 2021: Project 92).

However, accountability challenges remain. For instance, the on-site engineer at the extra-care living lab was concerned that a considerable amount of their time was spent installing consumer devices such as Amazon's Alexa product – used as a voice activation interface for automation technologies. Initially, these seem like cheap solutions that allow for easy interoperability between devices. However, the scope of the £70,000 Innovate UK project did not allow for a robust exploration of the implications for ongoing maintenance and repair of the physical, social and data infrastructures on which robotics depends. Uncertainty remains about who to call when these devices fail and who might be responsible for ensuring that the recorded data are accurate and conform to ethical standards in social care.

More broadly, while the strategies of ALR researchers focus on broadening out participation in innovation procedures, they do not directly engage in reconfiguring the UK's major accountability structures, such as the ASCOF framework. Where there is focus on accountability relations, it remains locally situated.

Discussion: what innovation in social care neglects

Answering the research question, the analysis reveals four logics of innovation to which project goals align: improving service provision; building techno-deterministic infrastructure; better situating knowledge and resources; and building and strengthening human relations. The results show diversity in the aims of innovation, but in the main, there is strong coherence with incumbent ways of configuring social care infrastructures in UK policy. Almost £3 out of every £4 of funding goes towards improving services and technological infrastructure. Recall that social care does not have to be organised through the provision of services in a market. This is a political choice, to which the stated goals of these UKRI research projects adhere. Intended beneficiaries of this innovation are: national and local government through cost efficiencies; service providers by way of data and technological efficiencies; and individual end-users.

The implications for accountability are as follows. We found little evidence in the corpus of projects that explicitly aimed to improve accountability structures. The

evidence base cannot tell us whether this is because: researchers do not acknowledge aims to address accountability in their research; problems with accountability are simply not recognised by research; or projects that would confront accountability are not deemed fundable. Whatever the reasons, this is a significant gap in UKRI's portfolio.

Indirectly, modes of accountability revealed in research centred professional and expert decision makers, technocratic and public administrative structures, and participatory and collective obligations. These findings align closely with Bracci's (2014) three modes of accountability introduced in the first section of the article and suggest that Bracci's framework might usefully underpin further analysis of innovation logics in social care sectors.

Our close inspection of research on the ground also revealed attention to accountability. The participative methods in the robotics research discussed in the fourth section of the article accord with a 'Mode-2' or 'triple helix' approach to science–society knowledge production that seeks to build accountability into research by working more closely with publics (Etzkowitz and Leydesdorff, 2000; Nowotny, 2003) and finding ways of '*really* involving stakeholders in innovation and practice' (Stahl and Coeckelbergh, 2016: 153, emphasis added) in order to make robotics more ethically and socially accountable. Moreover, the participative methodologies employed tend to emphasise locally situated elements in infrastructures of care, for instance, working with civil society groups, charities and local authorities. However, ambitions or procedures with which to reconfigure accountability structures at the national or international scale are neglected.

We find neglect in two other respects. First, there is neglect of a diversity of issues and people in the focus of public innovation and research. The research documentation that was examined tended to background aspects of social care that are outside of market arrangements or service provision models. Typically missing was explicit focus on professional and unwaged carers, as well as families, wider communities and the social components of care infrastructures. Moreover, methods and opportunities to cultivate capabilities in the care sector that would mutually benefit neglected actors and build resilience and care capacity over time were almost entirely overlooked.

Second, we find neglect in terms of the low level of institutional reflexivity mobilised by innovation research. Public research is an important way in which to evaluate how well innovation contributes to social progress (Stirling et al, 2018). In this sense, public research and innovation in social care research might contribute a public good in its ability to reflexively consider its own impact. The point here is not to say that research on innovation is uncritical. This article has reported other impressive contributions that reveal the diverse impacts of innovation in the sector. Rather, what is puzzling is how critical reports like these are marginalised in the framing of new research. For instance, Woolham et al (2018) show that many local authorities do not take into account negative research on telecare. Missing from the corpus are systematic evaluations of prior innovation policy and evidence of learning processes between innovation policy, innovation research and practices on the ground. The danger here is that unless research for innovation is accountable at a system level, there may be a continued blind adherence to innovation logics proved inadequate by COVID-19.

More broadly, it is difficult to interpret policy decisions and indecisions in UK social care in the decades before COVID-19 as anything other than sustained neglect. A grave risk of sticking with inadequate innovation logics here, and elsewhere, is that neglectful innovation sustains the machinery of a neglectful

state – 'one which fails to take easy steps to reduce risks to population health, and as a result allows significant numbers to come to avoidable harm or death' (Wilson, 2021: 241). Future research might draw attention to specific examples of how it is that innovation directed towards social care can, in the end, neglect those who most need that care. Here, we suspect that systematic attention to how innovation logics performatively direct modes of accountability would yield useful results. It is worth, then, returning briefly to theory. Taking diverse matters of care seriously (Puig de la Bellacasa, 2011), this research shows that obligations of accountability and the social and material things that structure them are not optional features of social care's infrastructures. Rather, they may be a critical emergent feature on which the long-term health and well-being of people who need social care depends.

Conclusion

This study has shed light on two critical roles that innovation plays in social care and long-term care. First, in reconfiguring infrastructures of care, diverse logics of innovation propel shifts between modes of accountability. Second, innovation offers the possibilities of improving instruments of accountability within those modes. However, we have also shown that research on innovation has a third role, often backgrounded at the project level: to reflexively consider the progress and impacts of innovation – positive and negative – and the extent to which such innovation aligns with how publics value such obligations as accountability in the first place. In that, policies and practices of innovation must consider not only what social care infrastructures hold to account, but also what they neglect.

In this regard, we have suggested ways in which Bracci's (2014) framework for evaluating service innovation would be usefully augmented not only by concepts of care and neglect (Puig de la Bellacasa, 2011) and infrastructures of care (Weiner and Will, 2018), but also by perspectives on the performativity of innovation and innovation's outcomes (Ezrahi, 1990; Marres, 2012). This is not to decide in advance that accountability structures emphasising, for instance, the role of professional and expert decision makers are any better or worse than technocratic and public administrative structures. However, it is to recognise that such emphasis is a political choice and that innovation that accords with values of accountability and democracy might usefully broaden out decision making to stakeholders and publics at various levels.

Such a framework is not predictive. We cannot tell in advance how the logics of innovation projects will actually reconfigure infrastructures and accountability on the ground. For this, funders and governments must build better capacity to reflect, adapt, steer and learn from innovation in social care, for example by incorporating formative evaluation that assesses the processes of innovation, as well as outcomes (Bone et al, 2020; Michalec et al, 2021). This sort of evaluation is vital if we are to sufficiently interrogate existing and emerging logics of innovation, such as digital transformation in care (Zanutto, 2021).

What this analysis does show, however, is that innovation on its own cannot be expected to resolve problems with accountability and neglect in social care. In fact, innovation that sustains neglect may make these problems worse. Without accompanying work that identifies and critically challenges deficient modes of accountability, some infrastructures of care will continue to be a trap from which many participants have no exit and in which they are granted little voice.

ORCID iD

Cian O'Donovan https://orcid.org/0000-0003-4467-9687

Notes

[1] The NIHR is also a significant funder of research in UK social care. Nevertheless, our choice of examining UKRI is justified by the aims of the research: to track how the logic of innovation-as-treatment across society is reconfiguring accountability. Of course, in the future, the approach followed in this article might be usefully applied to NIHR's portfolio, and the results discussed in the following offer an initial point of comparative analysis for such work.

[2] See: https://gtr.ukri.org

Conflict of interest

The author declares that there is no conflict of interest.

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