

The risks and opportunities of adopting digital technologies as part of unpaid care

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Abstract

The integration of digital technologies into unpaid care work is rapidly transforming how families provide and experience care. This paper synthesizes existing research on how digital care technologies are reshaping unpaid care work in the Global North and urban China, with particular attention to their impact on inequality, privacy, and care quality. While these technologies offer benefits in terms of convenience, remote care capabilities, and improved coordination among caregivers, they simultaneously introduce significant risks that warrant critical attention. Our analysis reveals that digital care technologies can exacerbate existing social inequalities, with access and effective utilization often stratified along lines of gender, socioeconomic status, and geography. We identify serious privacy concerns operating at two levels: within families, where technologies can disturb traditional privacy boundaries, and in relation to technology companies, where intimate care data becomes commodified. The emergence of ‘transcendent’ caregiving, enabled by digital technologies, has introduced new possibilities for remote care while simultaneously creating challenges around work–life boundaries and caregiver burnout. Furthermore, the datafication of care practices, while offering a promise of quality and ‘scientific’ standards, risks reducing complex care relationships to quantifiable metrics at the expense of emotional and relational dimensions. Our findings suggest that digital care technologies are most effective when they augment rather than replace human care, and when implemented with careful consideration of privacy, equity, and the preservation of meaningful human connections. We conclude that while digital care technologies offer significant potential benefits, their implementation requires careful oversight and regulation to ensure they enhance rather than compromise care quality. These findings have important implications for policy-makers, particularly regarding the need for regulatory frameworks specifically addressing care technologies, and interventions to address digital inequalities in care contexts.

Keywords: unpaid care work, digital technologies, digital divide, inequality, privacy.

JEL codes: J13, J14, J16

I. Introduction

The Global North is experiencing an unprecedented ‘care crisis’ characterized by intensifying demands across the lifecycle. In recent decades, intensive parenting norms have increased the expected time and resources parents invest in their children’s development and future prospects (Sani and Treas, 2016). Simultaneously, ageing populations have resulted in growing care gaps for older adults, with formal care services often insufficient or unaffordable, increasing the need for family care (Pickard, 2015; Rahman *et al.*, 2022). The economic significance of unpaid care work is substantial. Suh and Folbre (2016) estimate that if unpaid childcare were accounted for in the US GDP, it would need to be adjusted upwards by 43%. Citing AARP estimates, Fetterolf *et al.* (2025, p. 119) note that family carers of adults in the US provide an estimated \$600 billion worth of unpaid care annually, rivalling the market capitalization of major Fortune 100 companies.

Care technologies are often viewed as a broad and efficient answer to care needs, aligning with national objectives to reduce costs and free people up for more ‘productive’ paid labour.

This approach, however, may lead to a simplified and largely one-size-fits-all perspective on care, rooted in a ‘technological solutionism’ that tends to treat complex social care needs as issues that can be streamlined through digital means. Scholars have raised concerns over the policy-makers’ tendency to frame care technology as a singular fix for complex and interconnected caregiving needs (Samén *et al.*, 2024)

Care is a complex concept that can be used to refer to ‘the labour, resources and relations involved in the provision of care and assistance for those requiring it’ (Daly, 2021). In this paper we define care as labour ‘centred on activities to support another person’ (Hamblin and Lariviere, 2023). As digital technology adoption in care settings accelerates, we must assess how these tools are reshaping the nature of unpaid care itself and pay attention to the lived experiences of families adopting them. This understanding will inform evidence-based recommendations for policy-makers, families, and developers to safeguard and potentially enhance unpaid care quality in an increasingly digitized context.

In this paper we pull together disparate strands of research that frame technologies used in family care as ‘sociotechnical systems’—complex arrangements where technical components and social behaviours mutually shape and influence each other (MacKenzie and Wajcman, 1999). Through the lens of technological affordances (boyd, 2014), we examine how the integration of technology as a care tool transforms the nature of unpaid care within families, with particular attention to its implications for both caregivers and care recipients. We identify and summarize three core themes in existing literature: (i) digital technologies may entrench existing inequalities in care, (ii) digital care tools are associated with inherent privacy risks, and (iii) the datafication and ‘always on’ nature of digital care change the nature of unpaid care. We also highlight examples where these technologies enhance family care when implemented thoughtfully, complementing rather than displacing human connection.

The paper proceeds as follows. We start with a brief outline of our search strategy and selection criteria for the papers synthesized in this overview. We then unpack the core themes identified in the literature. First, we examine how digital care technologies interact with existing structural inequalities. Second, we analyse the inherent privacy risks of digital care technologies, both within families and in relation to technology companies’ data collection practices. Third, we explore how these technologies are transforming the quality of care with a particular focus on ‘always on’ ‘transcendent’ caregiving and the datafication of care practices. We conclude with a short discussion of the implications for policy-makers.

II. Search strategy and selection criteria

Our analysis focuses on digital technologies, including AI, used by parents and guardians in child-care and in supporting children’s education, and by family members caring for adults requiring assistance. Examples of relevant technologies utilized in care include voice assistants, home monitoring systems, apps (parental control apps, for example), and algorithms, such as large language models. See Table 1 for the list of technologies covered in the reviewed literature.

We largely limit our enquiry to the Global North, as the differences between Global North and South are too substantial to address comprehensively within a single paper. We make one important exception for research based on examples from urban China. While China is normally not included in the definition of the Global North, when it comes to care technologies adoption, middle-class families from urban China are exposed to similar technological opportunities as families from the Global North. Including research on China and developed countries in Asia, such as South Korea, enables us to incorporate the findings from research that is set up outside European and Anglophone context and yet grapples with the technologies and family choices that are very similar to what we observe in the Western setting.

References for this overview were guided by structured brainstorming on how digital technologies are transforming care work. Relevant research papers were identified searching the titles and abstracts of peer-reviewed papers published in English, using the terms: (‘digital’ AND ‘technology’ AND ‘parenting’) OR (‘digital’ AND ‘family’ AND ‘elder’ AND ‘care’) in two databases, Scopus and Web of Science. We excluded science journals from our search. The 281 search results were screened by two reviewers and yielded 62 relevant peer-reviewed publications. Discrepan-

Table 1: Digital technologies used to facilitate unpaid family care in papers covered in this overview

Care task	Type of technology	Specific technology examples mentioned	Reference number in Supplementary Table 1
Supervisory childcare	Smart baby monitor tracking via wearable bio-sensing monitors	Owlet	37, 45
	Parental monitoring applications and software (Screen time)	Apple screen time	5, 22, 23, 35, 47
	Baby monitoring app	Sprout, BabyConnect, Ebluebook, Feed Baby, mum2mum	38, 44, 50, 60, 69
	GPS-based digital location tracking	Find my iPhone, Life 360, Google Family Link, Apple Maps, Qustudio	17, 22, 23, 24, 35, 47, 54, 55, 59, 64, 68, 76 80
Supervisory elder care	Smart home devices	Smart camera	80
	Behaviour and location monitoring tools (remote elder care)	Lilli, Alexa Together, Lively Home, Lively Mobile, SHel	8, 15, 33, 49, 57, 70, 79, 81
	Telehealth tools (symptom tracking)	Smart4MD app, Interaktor, Health Buddy	8, 29, 31, 33, 36, 49
Communication and relationship management	Smart home devices		63, 79
	Parent-daycare mobile communication app	Aula	2, 30
	School apps and software	Eduspot, Edmondo, Parentpay, ParentMail, ClassDojo, Tapestry	32, 48, 61
	Digital devices facilitating remote communication with older adults	Mobile phones, Skype, telecommunication terminals, LINE app	7, 14, 36, 58, 59, 77
Information seeking and online support	Telehealth tools (patient-carer-doctor communication)	Smart4MD	8, 29, 31, 3, 36, 57, 81
	Socially assistive robots (SARs)	Pepper robot, Hyodol robot	3, 18, 49, 71, 72, 79, 81
	Parenting app	Childbirth Journey, Interplay, WellWe, Social media apps, LINE	4, 9, 12, 16, 39, 47, 48, 51, 65, 73, 83
	Parenting forums	Modern Mummy Club, World Society of Mums, Mums, Mums and Bubs	16, 19, 21, 27, 43, 47, 48, 51, 61, 75, 83
Entertaining and educating a child	Online support network for elder caregivers	ComputerLink, Tess Chatbot, Living It Up, Jointly, ClickGo	8, 31, 33, 42, 57
	Digital toolkit for adoptive parents		28
Co-ordination of care	Child-directed mobile apps (we focus on cases where parents bring in apps explicitly to replace their own care labour)	Baby Bus, Beva Children's Song	12, 20, 47, 48, 68, 83
	Co-parenting app	Our Family Wizard, Cozi	26, 74
	Community care-sharing platform	Families_Share project	13
	Smart/AI domestic labour tools	Alexa	33, 41, 53
	FinTech tools for money transfer		64

cies between reviewers were discussed and resolved. Additional 21 references were identified from the authors' own files and specific searches to support arguments regarding benefits and risks of digitalizing unpaid care. We did not limit our searches by date. The earliest relevant identified paper was published in 2001. The full list of references we relied on to develop this overview is available in [Supplementary Table 1](#).

We find that as of 2025 digital technologies are commonly used to help with only a small number of unpaid family care tasks. These are: supervisory care, communication and coordination across carers (both paid and unpaid), and information seeking.

III. Promise or peril? Digital care technologies and the reproduction of structural inequalities

Developers of care technologies for domestic settings often promise to address care needs more efficiently and equitably. However, this promise tends to overlook or gloss over the fact that these technologies are adopted within social structures characterized by inequalities and can reinforce and even exacerbate pre-existing social inequalities (Suarez *et al.*, 2016; Buchner and Wierzbicka, 2018; Jin *et al.*, 2024). Social inequalities manifest across various dimensions, including gender, age, geography, education, and income, creating a web of intersectional disparities that digital care technologies may deepen. The prospective users' ability to utilize digital care tools often interacts with users' varying levels of resources, skills (Zirakbash *et al.*, 2023), and capabilities, which are unequally distributed across society. This context plays a substantial role in shaping how technologies are adopted and whether they can improve care outcomes. Individuals with greater technological competence and access to supportive environments are better equipped to integrate digital tools into their routines, while others face significant barriers.

One key inequality regarding care work pertains to gender. Care work has always been disproportionately shouldered by women. Digital care technologies intersect with entrenched gender norms and the unequal division of domestic labour (Peng, 2022; Langton, 2024; Näre and Isaksen, 2024). The increased adoption of digital care technologies at home comes with the need to manage, troubleshoot, and teach family members how to navigate digital tools—tasks that are rarely acknowledged in policy or technological design (Peng, 2022; Heaselgrave, 2025). The potential for technology to redistribute care work equitably remains largely unrealized. Digital tools could free up time spent on routine care tasks and bring about greater gender equality in care provision (Hertog *et al.*, 2023). There is some evidence that digital housekeeping—the labour involved in maintaining digital technologies that a household relies on in good working order—is disproportionately undertaken by men (Kennedy *et al.*, 2015). However, as men spend more time on digital housekeeping, they may end up spending less time on other household tasks (Aagaard, 2023). Moreover, available evidence suggests that care labour that is done with the help of digital technologies conforms to the traditional gendered dynamics. A Pew Research Center survey of 494 American parents shows that mothers give and receive parenting support on social media to a greater extent than fathers do (Duggan *et al.*, 2015). In a study based on 147 interviews with Chinese fathers and mothers, Peng (2022) finds that digital technologies that facilitate some parenting tasks, like searching for parenting information, or maintaining online communication with teachers, have done little to disrupt traditional gender roles in urban China, where women continue to be disproportionately responsible for childcare labour. Similarly, in a study citing interviews with 12 Australian women, Johnson (2014) finds that far fewer parenting apps are aimed at fathers compared to mothers. By implicitly encouraging maternal, but not paternal engagement, apps can reinforce and even amplify existing care inequalities in provision when it comes to parenting.

The ability to benefit from digital care technologies is also deeply intertwined with socioeconomic factors such as education, income, and class (Jewitt *et al.*, 2021; Näre and Isaksen, 2024). Higher-income families are more likely to possess the necessary infrastructure—including reliable internet access, updated devices, and technical support—to fully utilize any available digital care solutions (e.g. Perrin and Atske, 2021; Vogels, 2021). In contrast, lower-income households often lack these resources, creating a significant accessibility gap. This disparity extends beyond device ownership and infrastructure availability to encompass the skills and capabilities required to effectively use these technologies. For example, Näre and Isaksen (2024) found that, in the pandemic, when in-person communication—which forms a large part of adult care—was moved online, only older adults who were already capable of using devices could substitute physical contact with a virtual one. This created a two-tier system where digitally literate care recipients were relatively able to maintain their social connections and benefit from remote care while others experienced increased isolation.

Digital literacy, which involves not only technical proficiency but also critical evaluation of technology, is strongly influenced by broader social structures. As such, individuals with higher levels of education and incomes are better positioned to develop these competencies (Mancino, 2023; Sidoti and Vogels, 2023). Consequently, those who are already socioeconomically advantaged—through better education, stable incomes, and class privilege—are more likely to gain from digital care innovations. This dynamic not only perpetuates but amplifies existing inequalities, leaving marginalized groups further behind.

Beyond the socioeconomic dimensions, digital care technologies can also exacerbate inequalities across other, often correlated, dimensions such as geography (Maslen, 2021). Rural households, for example, may lack the robust internet connectivity required to support many digital care solutions, while urban households often have access to the newest technological infrastructure (see Lee *et al.*, 2021; Cui *et al.*, 2024). This creates a fragmented landscape where some individuals are able to leverage technology for improved care while others remain excluded. The assumption that all users are equally equipped to engage with digital tools overlooks the diverse social and cultural context that shapes user experiences, as well as the systemic factors that inhibit equal participation.

The introduction of digital technologies into care work, while purporting to address care needs, can thus paradoxically exacerbate existing inequalities. Those who could in principle benefit most from digital care support—often less technically skilled, or economically disadvantaged individuals living in remote areas—may find themselves further marginalized by the very solutions meant to help them. This suggests that integration of digital technologies in care work needs to take account of pre-existing multidimensional inequalities. To be equitable, it requires a commitment to addressing disparities in infrastructure and access and, most importantly, a re-evaluation of how technologies interact with existing forms of social inequities.

When digital interventions are implemented with attention to human relationships, as a complement to rather than replacement for human care, and with accessibility considerations in mind, these technologies can enrich care relationships. The South Korean Hyodol robot provides an instructive example. Small-scale qualitative studies suggest that these companion robots can alleviate loneliness in older adults, including those from disadvantaged backgrounds. Shin and Jeon (2024, p. 192) write that Hyodol robots create a ‘robotic multi-care network’ connecting older adults, social workers, homecare aides, and family members, leading to ‘new care relations that involve more, not fewer, caregivers’. At the same time, accessibility may break down after 2 years of use when the state stops covering the telecommunication and repair support (Shin and Jeon, 2024, p. 190). Additionally, the benefits for older adults currently come at the cost of increased workload and emotional labour for social workers overseeing the programme (Shin and Lee, 2024). These problems need to be addressed for long-term viability of the ‘robotic multi-care network’ and its benefits.

IV. Inherent privacy risks

The integration of digital technologies into unpaid care work introduces significant privacy concerns that operate on two distinct levels: within families and in relation to technology companies. To make sense of these concerns, we use a concept of affordances, defined by boyd (2014) as ‘particular properties or characteristics of an environment’ that ‘make possible—and, in some cases, are used to encourage—certain types of practices, even if they do not determine what practices will unfold’. While privacy negotiations within families have always been complex, the affordances of digital care technologies mean that personal information can be collected easily, often without explicit consent or even awareness of the individual, and shared frictionlessly both within families and with the companies producing these care technologies.

(i) Dwindling privacy within families and consequences for family relationships

The adoption of digital care technologies—including location tracking devices and apps, nanny cams, parental control software, and devices with ‘listening in’ capabilities like Amazon’s Alexa—can significantly reshape privacy boundaries within families (Ribak, 2025). Information sharing

is often integral to building closeness and connection in family relationships. Information sharing between family members through new technologies is not necessarily problematic if it is done consensually and both parties feel it benefits them. Examples include dementia patients stating they would like location tracking used for them (Turner and Berridge, 2023), and adolescents who perceive location tracking as a tool that can promote their autonomy when used collaboratively with their parents and with a jointly agreed goal of young people's safety rather than surveillance (Hertog *et al.*, 2024).

At the same time the affordances of supervisory care technologies nudge caregivers to focus on monitoring data prior to, or sometimes instead of, in-person communication (Hertog *et al.*, 2024). This transformation fundamentally challenges traditional caregiving, which Pugh (2024) characterizes as steeped in 'connective labour'—relational work requiring listening, understanding, and fostering mutual trust. Digital technologies can replace this labour, allowing caregivers to monitor and influence behaviours at a distance, sometimes without direct interaction or even the awareness of those being cared for.

Non-consensual monitoring, however, can undermine family relationships. In a study based on a series of focus groups with UK adolescents, Hertog *et al.* (2024) find that when parents utilize digital monitoring technologies as part of their supervisory childcare, it has consequences for the way parents communicate with their teens, the quality and nature of parent–teen negotiations, perceived trust within families, and teens' development of personal autonomy. Contemporary parenting increasingly occurs in hybrid spaces where parents can monitor children's movements in physical space and maintain a kind of caring dataveillance (Lupton, 2020) with the help of smartphone applications. The flow of sensitive location information between children and parents can disrupt norms around appropriate parenting. Content created by young people on social media that focuses on evading their parents' monitoring efforts or voicing dissatisfaction with being tracked, is popular, suggesting that many children feel that the practice warrants strong pushback (Mavoa *et al.*, 2023). Adult care, where information flows from older adults to their adult children raises similar concerns about undermining personal boundaries and privacy *vis-à-vis* other family members (Alkhatib *et al.*, 2021, p. 487).

The potential for new technologies to create unprecedented opportunities for surveillance and amplify power imbalances within families presents particular risks where family relationships break down. As Douglas (2023) notes, smart digital care technologies can be repurposed as surveillance devices, introducing new forms of power abuse within households.

Given these risks, it is essential to develop comprehensive safeguards, including privacy-by-design principles in technology development (e.g. Li *et al.*, 2023), educational initiatives for families, and accessible support services for those experiencing technology-facilitated abuse within household relationships.

(ii) Loss of privacy to big tech

Even more problematic than intra-family privacy concerns is the extensive data collection and potential monetization of personal data given up in the process of digitized family care by technology companies. The effective deployment of many care technologies necessitates access to intimate details about care recipients—their needs, medical conditions, preferences, and daily routines. Baby apps can, for example, track and share detailed information about children, including their health, development, and location (Johnson, 2014). In some cases, the data collection is encouraged through the promise of convenient personalization, rather than because of inherent need. Once quantified, data collected as part of care work becomes a valuable commodity that can be owned, analysed, and used for corporate profit, potentially to the detriment of the individuals from whom it was collected.

Existing research and advocacy on digital technologies and algorithms highlight the opacity of publicly available information on the ways companies use and share user data (Pasquale, 2015), the lack of user control over the data collected from them (Draper and Turow, 2019), and the weak regulatory framework governing data privacy, especially in the US (Zuboff, 2019). The possible negative consequences of this situation are amplified in the case of care technologies as they collect data in an environment where individuals are not primed to guard their privacy,

and from multiple household members, many of whom may lack the ability, due to age or other factors, to give informed consent to have information about them collected and used (Burrows *et al.*, 2018). Data of some family members can be seen as having less worth than data from others and thus could be more readily given away. In one example, a 2015 Pew Research Center survey of American parents found few were concerned about the content posted about their children on social media by family members (Duggan *et al.*, 2015). Similarly, Langton (2024) finds that parents are often unconcerned about data privacy of baby apps, as the datafication of mundane tasks appears valuable only in the context of their day-to-day parenting routines.

The situation becomes even more problematic when data is not freely given. In some cases, carers ‘volunteer’ data because of a sense of ‘digital resignation’—i.e. carers resign themselves to having to give up control over their family’s data to access app-based support (Langton, 2024). In others, carers must do this as part of interactions with public institutions that support their own unpaid care provision. For example, parents can be expected to update information, such as drop-off and pick-up times, parental contact details, holiday plans, children’s medical details, and so on as part of communication with day care or with school and opting out is often not an option. Such digital participation is coerced as individuals are forced to provide their data in exchange for public childcare and education (Andelsman Alvarez and Meleschko, 2024). In some cases, data recorded by parents through apps as part of their childcare routines can also become a means of disciplining them, particularly when shared with public institutions, for example by highlighting missed developmental health checks such as immunizations (Johnson, 2014, p. 344). Finally, the digital technologies adopted by public institutions are usually provided by private service firms, who then potentially have access to all the data collected from individual families giving rise to privacy concerns detailed above.

While many companies claim to protect privacy by not capturing personally identifying information, the complexity and breadth of collected data often enable individual identification through pattern analysis. The promise of anonymity, frequently embedded in privacy policies, becomes increasingly hollow as sophisticated data analysis techniques advance. This is particularly concerning given that algorithmically assembled data could constitute ‘digital dossiers’ that might influence children’s future access to educational opportunities, employment, insurance, or financial credit. At the same time, we do have a variety of digital technologies with different privacy affordances on the market. In her review of baby apps, Langton (2024, p. 22) notes that some offer users significant control over their data.

These privacy concerns highlight the need for robust regulatory frameworks specifically addressing care technologies. Rather than leaving data management to individual users, who may lack awareness or feel resigned to privacy compromises, policy interventions should focus on regulating technology companies. Care-related data should be classified as sensitive information, with explicit and transparent protocols governing its collection, use, and sharing. This approach would help protect vulnerable individuals while preserving the potential benefits of digital care technologies.

V. Changing quality of care

Digital care technologies are also transforming caregiving practices, with implications for how care is performed, the quality of care, and the nature of human relationships in caregiving contexts. While marketed as solutions to enhance caregiving efficiency, such technologies reconfigure caregiving by reshaping priorities, alter relationship dynamics between caregivers and recipients, and potentially challenge our understanding of what constitutes quality care. Below we examine available evidence on these issues.

(i) The emergence of ‘transcendent’ caregiving

The first major change is the emergence of ‘transcendent’ caregiving. This term builds on the investigation of ‘transcendent parenting’ by Lim (2020). Lim explores a shift to omnipresent care in the context of childcare, but the same issues are likely to come up in the context of adult care. Digital communication technologies enable children to be perpetually connected to their

parents. Children and public institutions that may temporarily be looking after them (such as day care or schools) can continue to seek their parents' assistance throughout the day. 'In such a climate, whether parents are at work or at home, together or apart from their children, they continue to parent' (Lim, 2020, p. 3). As such, transcendent care introduces a relentless 'always on' quality to caregiving. On the positive side, these technologies can facilitate communication and coordination among caregivers, synchronizing the information and approaches between different carers (parents and day care staff, for example) caring for the same person (Andelsman Alvarez and Meleschko, 2024), as well as between caregivers and those they care for (Beckman and Mazmanian, 2020). Continuous connection, however, can also intensify pressures on family carers (Lim and Wang, 2024) and put especially high pressures on women, who are more likely than men to shoulder high levels of digital family communications (Hu and Qian, 2024). It makes it difficult for individuals to establish boundaries between work, personal, and caregiving times, leading to significant role conflict for the carers. The challenges of boundary management and being continually tethered through digital technology have mostly been explored in the context of paid work (Ollier-Malaterre *et al.*, 2019), but unpaid care presents similar issues. Some monitoring technologies have also been shown to induce alarm fatigue from false positives (Maslen, 2021).

A second issue is that digitally supported care increasingly transcends physical distance. In some cases, the distance is small. In one example, Jewitt *et al.* (2021) show that parents may place infants in separate rooms earlier than planned, relying on monitoring devices to maintain a sense of connection. This can offer important benefits, such as improved parental sleep, but it also risks undermining the physical closeness and touch that is central to caregiving generally and especially care for young children. Several studies document the benefits of remote care for older adults. Sum *et al.* (2008) found that older adults who used the internet to communicate with friends and family experienced reduced feelings of loneliness. Hjorth and Lupton (2021) document examples of adult caregiving conducted remotely in a 'consensual and profoundly relational' way, enabling adult children living far from ageing parents to engage in previously impossible forms of care. The most common interventions to combat old-age loneliness are innovations using a telepresence that relies on a connection to a human carer, often a family member who will check in and intervene in a crisis (Welch *et al.*, 2023), for example by responding to fall-detection technologies (e.g. Kim *et al.*, 2020). While transcending distance offers several benefits to both carers and those cared for, it cannot replace in-person care without some loss in quality, and much of the care work cannot be done without physical co-presence. Policy-makers must recognize these limitations when promoting remote care solutions.

Finally, one notably positive change is digital platforms' creation of opportunities for collective support and knowledge building among carers that transcends distances and other constraints. Digital platforms have been shown to expand dialogue between parents from different families (Lupton *et al.*, 2016) and to transform caregivers' information seeking, which can be a solitary struggle, especially for families with atypical needs, into shared experiences (Deville, 2024). Johnson (2015) shows how for new mothers 'online sharing of experiential stories of pregnancy, childbirth and mothering can impart valuable emotional support and knowledge of various medical outcomes or possibilities'. Online spaces can empower mothers to 'reclaim knowledge from the medical establishment, making it their own' (Johnson, 2015). However, these benefits are heavily contingent on the quality and credibility of the digital collectives one joins. Studies have shown that parents seeking support online can sometimes encounter misleading or dangerous misinformation, particularly around health issues. Reich (2016) found that some parenting communities can reinforce and amplify conspiracy theories about medical treatments, leading parents to make decisions that put their children's health at risk. In recent years, some of this knowledge building is happening with the help of chatbots rather than within human communities (Ruggiano *et al.*, 2021). There are several possible benefits of making use of chatbots. Large Language Model (LLM) chatbots are available 24/7, can package the information in very accessible ways, and can make information-gathering very efficient for time-poor carers. However, chatbots used by carers 'can sound reasonable and human-like, but an LLM chatbot cannot contextualize or understand the implications of what it produces. Outputs may in fact be fabricated, factually inaccurate or misinformed' (Emmer De

Albuquerque Green, 2024). This underscores the critical importance of being able to evaluate the credibility of online sources and communities as well as of designing online spaces and LLM chatbots for family carers and those cared for to gather reliable information and find support.

Whether care technologies enhance emotional support, social connections, and improve the quality of care also depends on how care is conceptualized by the technology developers. As pointed out in Wright's (2023) ethnographic work in Japan, engineers often have a limited understanding of the actual everyday needs of older adults. Instead, their approach is informed by 'abstraction of older adults, and the care required', the institutional research environment, and a broader cultural conceptualization of care. Referring to Wilding (2018) and Neven and Peine (2017), Wright argues that when tech developers are mostly male, able-bodied, with high income, and when they work in teams with little diversity, their understanding of elderly care is likely to be predominantly shaped by the ideas of individualism and autonomy. These ideas in turn impact the design of the care robots (e.g. robots to assist with lifting older people, robots that are supposed to serve as entertainers in care homes) they develop. Such technologies may have little value for the elderly or can even intensify loneliness. These findings highlight the importance of acknowledging and addressing technology developers' positionality and cultural contexts when considering the (mis)match between available care technologies and care needs.

(ii) Datafication of unpaid care work

Algorithms used in digital care technologies require that relevant information is digitized. Through this process, measurable elements become more visible and salient, potentially overshadowing equally important but less quantifiable dimensions. The 'screen time' metric often used in supervisory childcare illustrates these limitations well (Kaye *et al.*, 2020). While widely used by parents to supervise children's digital activities, this measure fails to capture crucial qualitative differences—an hour spent watching educational content versus harmful material becomes indistinguishable when reduced to a time measurement.

In paid care work, quantification aims at quality control and avoiding discrimination. In unpaid care work, carers are encouraged to quantify their labour to achieve externally prescribed, 'scientific' standards of care. This trend intersects with the broader standardization and professionalization of caregiving. Within the discourse of parenting apps, child-rearing expertise is increasingly determined by external experts within a supposed scientific framework. Parents are positioned as 'instruments in the realization of their children's optimal development' (Ramaekers and Hodgson, 2020). While parenting apps share similarities with traditional forms of parenting advice, they also intensify the standardization of parenting norms that are often rooted in particular ideologies and class hierarchies (e.g. Robinson, 2021).

The rise of maternal apps exemplifies this trend. Apps like Baby Connect transform caregiving into a datafied activity, converting subjective experiences into measurable data. Johnson (2014, p. 342) describes this as 'scientific mothering'. Parenting apps shift parent-child interactions towards being 'mediated through data and visualized metrics, rather than tactile experiences' (Jewitt *et al.*, 2021, p. 580). Technologies reliant on datafication can provide reassurance to caregivers as facilitating a sense of agency and control during demanding times (Lupton, 2020; Langton, 2024). They may also detract from the emotional and relational dimensions of caregiving, redefining care recipients as objects of observation rather than participants in meaningful interactions (Leaver, 2017). As an Australian study that investigates infant feeding and baby-tracking apps points out, how parents understand and approach child-rearing is increasingly shaped and defined by datafication, and imagining ways of parenting outside of a quantified environment has become increasingly difficult (Pangrazio *et al.*, 2025).

In education, the digitalization of education environments is generating a continuous stream of quantified observations that enable school staff to transmit real-time behavioural data, such as attendance or disruptions in class, directly to parents. As shown by Manolev *et al.* (2019), this mechanism not only converts qualitative aspects of student behaviour into quantifiable metrics but also repositions parents as active enforcers of school norms. Based on the example of ClassDojo, a classroom management app, the authors argue that the adoption of such technolo-

gies introduces new layers of surveillance of children and intensified datafication in the teacher–parent relationship, transforming what was once an internal educational practice into an ongoing, data-driven process. This transformation is further reinforced by the automated reports sent to parents, generated from continuously tracked student data, which encourage regular engagement with their child’s progress. These reports are delivered directly to parents’ inboxes on a weekly basis, with the option to adjust the frequency to daily, monthly, annually, or all the time. By embedding parental involvement into this data-driven system, ClassDojo creates a scenario where not only are students surveilled, but parents are also implicated in reinforcing disciplinary norms at a micro level, blurring the boundaries between the school environment and the home.

There is a similar pattern of standardization in line with a particular vision in adult care. [Czech et al. \(2023\)](#) find that home monitoring systems available on the market are based on particular assumptions of safe and desirable ageing. While promising ‘independence’, ‘safety’, and ‘peace of mind’ in their marketing materials, these systems limit the autonomy of those being monitored, restrict their access to the data that are collected, and increase vulnerable adults’ dependency on their carers. In addition, as home monitoring systems are only operational within homes, they promote a ‘staying-at-home’ mentality, increasing the risk of isolation for the care recipients.

(iii) Policy reflections

The transformation of care quality through digital technologies necessitates thoughtful policy responses. Policy-makers must recognize that while remote care offers benefits, it cannot fully replace in-person care without quality loss. Similarly, datafied care can help ensure that carers adhere to sound standards of childcare or adult care but can also compromise less easily measurable, but equally important, dimensions of care, such as rapport between a carer and the person cared for. Policy frameworks should address the tension between leveraging technology’s benefits, preserving the essential human elements of care, and respecting the privacy and dignity of carers and those they care for. This includes developing standards for technology implementation that protect the autonomy of both caregiver and care recipient while ensuring appropriate data access and control.

VI. Discussion

The integration of digital technologies into unpaid care work presents a complex landscape of opportunities and challenges that demands careful consideration from policy-makers, researchers, and families alike. Our overview of the literature on the topic reveals that while digital technologies used in care offer notable benefits in terms of convenience, remote caregiving capabilities, and improved communication and coordination among caregivers, and also between caregivers and those receiving care, they simultaneously introduce profound changes to the nature and quality of care that warrant critical attention.

The impact of digital care technologies manifests across multiple dimensions. First, these technologies have potential to exacerbate existing social inequalities. Our review suggests that when digital technologies are brought into family care the digital divide extends beyond simple access to encompass disparities in digital literacy, infrastructure availability, and the capacity to effectively integrate these tools into care routines.

Second, privacy concerns emerge as a critical issue requiring immediate attention. The current model of data extraction prevalent in care technologies poses particular risks when applied to intimate family care contexts. The combination of intra-family privacy challenges and corporate data collection practices creates vulnerabilities that disproportionately affect care recipients, especially children and elderly adults who may have limited agency in how their personal information is shared and used.

Third, the emergence of ‘transcendent’ caregiving, enabled by digital technologies, has introduced new possibilities for remote care while simultaneously creating challenges around work–life boundaries and caregiver burnout. While digital technologies have shown promise in fostering supportive communities among caregivers and enabling care across distances, they cannot replace the value of in-person care and physical presence.

Finally, the datafication of care recipients, practices, and care outcomes, while offering certain advantages in standardization and monitoring, risks reducing complex care relationships to quantifiable metrics. This transformation is evident in both parenting and eldercare technologies, where the experience of caregiving is increasingly mediated through data and visualized metrics rather than direct interpersonal engagement. While this data-driven approach can provide reassurance and a sense of control to caregivers, it may simultaneously deprioritize lived experiences and detract from the emotional and relational dimensions that are fundamental to quality care.

Available evidence suggests that the benefits of digital care technologies are most pronounced when they augment rather than replace human care, and when they are implemented with careful consideration of privacy, equity, and the preservation of meaningful human connections. Digital tools have shown particular success in information-seeking practices and in maintaining connections across distances, especially when they complement rather than substitute for existing care relationships.

The regulatory landscape for digital care technologies varies significantly across regions, creating inconsistent protections for families using these tools and potentially making compliance more difficult for developers. The European Union's General Data Protection Regulation (GDPR) provides the most comprehensive framework, with specific protections for children's data (Recital 38), though it lacks similar provisions for vulnerable adults. The GDPR's approach positions parents as privacy gatekeepers for their children, which may be problematic when parents lack digital literacy or when children circumvent age verification systems (Donovan, 2020). The United States has no omnibus privacy legislation, but children are protected under COPPA (Children's Online Privacy Protection Act). Some US states have enacted their own regulations, such as California's Consumer Privacy Act (CCPA) and Virginia's Consumer Data Protection Act (VCDPA). China has established its own data protection regime, with different emphases from Western approaches, balancing privacy concerns with robust state access to data (Zhang and Kollnig, 2023; for more examples of the variation in approaches to children's data protection, see the report by 5Rights Foundation (2022)). Research evaluating compliance with these varied regulations reveals significant gaps, such as care technology developers lacking understanding of their own apps' data collection behaviours, particularly when third-party software development kits are used (Alomar and Egelman, 2022; Schmidt *et al.*, 2023). Given the regulatory variation, the privacy risks highlighted in this paper will manifest differently across jurisdictions. Families in regions with weaker regulatory frameworks face greater exposure to data exploitation and commodification.

Looking forward, several key policy implications emerge:

1. There is a pressing need for regulatory frameworks specifically addressing care technologies, with particular attention to data privacy protections and ethical guidelines for implementation.
2. We need more research and better understanding as to how digital technologies transform unpaid care work and whether there are benefits and harms associated with these tools. Future research should prioritize participatory methods that involve both caregivers and care recipients, with particular attention to diverse populations and contexts.
3. Policy interventions should actively address digital inequalities in care contexts, ensuring that technological solutions don't further marginalize already disadvantaged groups.
4. The development and deployment of care technologies should not be left solely to market forces, given the essential nature of care work and its broader societal implications.
5. We need to develop ways to translate and enforce regulation among the developers of care technology to improve compliance.

While digital care technologies offer significant potential benefits, their implementation requires careful oversight and regulation to ensure they enhance rather than compromise the quality of care. Future research should focus on long-term studies across diverse contexts, examining not only the immediate benefits of these technologies but also their broader societal impacts and potential unintended consequences.

The existing literature provides some insights into the cost-saving potential of digital care technologies in formal care settings (e.g. an estimated £1.2 billion of savings to the NHS on social care expenses through adoption of digital monitoring (Lilli, 2024)), but there remains a significant gap

in research quantifying the economic and social impact, the distributional effect of digital inequalities, and financial burdens associated with the adoption of digital care tools in unpaid caregiving contexts. Future research must address this gap to enable a more comprehensive understanding of the economic realities and equity implications of integrating digital technologies into unpaid care. As societies continue to grapple with care provision challenges, digital technologies will undoubtedly play an increasingly important role. However, their integration must be guided by evidence-based policies that prioritize equitable access, protect privacy, and preserve the fundamental human elements of care relationships. Only through such a balanced approach can we ensure that technological innovations truly serve to enhance, rather than diminish, the quality of unpaid care work.

Supplementary data

Supplementary Table 1 is available at *Oxford Review of Economic Policy Journal* online.

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