

## ORIGINAL ARTICLE

# Platform encounters: A study of digitised patient follow-up in HIV care

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## Abstract

Digital technologies are increasingly embedded in clinical encounters, reconfiguring the basis on which health care is delivered. Thereby, the delivery of care shifts from territorial locations in clinics and temporal modes of co-presence towards digital platforms. Drawing on a sociotechnical evaluation of digitised patient follow-up in HIV care, this paper argues that the forms of interactivity practised in platform encounters cannot be adequately understood through traditional interaction frameworks such as Erving Goffman's interaction order. To conceptualise the new informational space and temporal mode of 'response presence' within which platform encounters are conducted, the paper draws on theoretical advances made by Karin Knorr Cetina who further developed Goffman's interaction order to describe interactions augmented by 'scopic media'. A comprehensive framework is presented to elaborate the distinct qualities of interactions occurring in face-to-face, tele-interaction and platform encounters and to analyse their affordances based on doctor and patient experiences. This framework is intended to stimulate further research on how new interactional forms between doctors and patients will reconfigure roles and responsibilities as well as wider structures of digital society. Furthermore, it can also support practical guidance of when and how different forms of clinical encounters may be integrated in care pathways.

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**KEYWORDS**

digital health, digital sociology, doctor–patient interaction, HIV, scopic media, telemedicine

**INTRODUCTION**

Health care is co-produced within interactional encounters between professionals and patients collaborating to change physical, mental or social status. The interactional complexities of this form of work has supported professionals' claim for autonomy (Abbott, 1988) and the specific structuring of healthcare organisations (Mintzberg, 1979) within which managerial attempts at routinisation and standardisation are found to be co-opted and negotiated rather than simply adopted at the treatment level (Numerato et al., 2012). A substantial and increasing proportion of clinical encounters, particularly in the current COVID-19 pandemic (Hollander & Carr, 2020), are performed through digital technologies that replace or supplement face-to-face encounters and reconfigure the basis on which health care is delivered. Understanding the performance of digitised doctor–patient interaction, we argue, is an important first step to approaching the broader structuration of embodiments of health, professional values and identities, and the organisation of care in digital society.

The sociology of health and illness has made considerable progress in understanding societal implications of digital health technologies by deconstructing policy discourses and analysing the reconfiguration of knowledge, connectivity and control alongside the increasing use of quantified data, platforms and algorithms (Henwood & Marent, 2019; Lupton, 2018; Marent & Henwood, 2021; Petersen, 2019). Scholars have analysed how the new information landscapes influence doctor–patient interactions (Hardey, 2001; Nettleton, 2004; Stevenson et al., 2019) and how virtual encounters (Langstrup et al., 2013) require new professional skills in establishing co-presence (Roberts et al., 2012) and for providing medical judgement based on data sense-making (Lupton & Maslen, 2017). Sociological theories have played an important part in describing the co-evolution of clinical encounters alongside technological advances (Andreassen et al., 2018; Trondsen et al., 2018). Through these insights, it has been demonstrated how classical sociologies of interaction – particular Erving Goffman's (1983) conception of the *interaction order* – remain useful, but require also adaptation for approaching digitally-mediated clinical encounters (Håland & Melby, 2015).

In this paper, we acknowledge this contribution of classical sociologies as important avenues for observing current modes of interactivity, while simultaneously taking our empirical observations of digital sociality as a challenge to help us rethink and adapt sociological theories of interaction. The empirical case we draw upon is the clinical follow-up of HIV patients who receive antiretroviral treatment (ART). A review of studies in this field has highlighted the unique role of the clinical encounter to handle treatment complexities and support patients' treatment adherence (De Kok et al., 2018). Within European countries, the availability of ART has contributed to longer life expectancy and, consequently, led to a continuously increasing number of people requiring long-term follow-up, which exacerbates pressures on healthcare providers (ECDC, 2017). In our study, these changes and the subsequent financial strains have led healthcare providers, technology developers and wider societal stakeholders to co-design and implement a digital platform that is shifting some clinical encounters from face-to-face environments to new forms of interactivity which enable patient follow-up and monitoring beyond situations of physical and temporal co-presence.

In this paper, we draw on the classical Goffmanian *interaction order* to conceptualise the unique qualities of the clinical encounter in the face-to-face environment alongside its spatial, temporal and social configuration. Acknowledging the need to further develop this framework in order to describe

HIV consultations that are performed through platforms, we introduce Karin Knorr Cetina's (2009, 2014) notion of *scopic media*. This notion allows us to theorise interactional social forms that are conducted in informational spaces, materialising on screens, and where interactions are formed along with asynchronous but linked activities (e.g. analysing, commenting, receiving health data). Through an *affordance perspective* (Gibson, 1979), we aim to outline the multidimensional relationship between the qualities/features of different consultation environments (face-to-face, tele-interactions and platform encounters) and the practices and experiences that emerge within these. Drawing on data collected in workshops and interviews with 72 patients and 32 health professionals, we develop a framework that outlines how distinct consultation environments support and/or restrict ('afford') the delivery of HIV care. We argue that a sociological understanding of platform encounters and their affordances offers important avenues for understanding the broader social implications of digital health and provides practical insights for reflecting upon adequate forms of patient follow-up across different social situations and contexts.

## METHODOLOGY

In the following, we highlight the systematic relationship between theoretical concepts and empirical methods – a necessary unity advocated by Robert K. Merton (1968: 139) – that were applied to explore platform-based clinical encounters and their distinct affordances in comparison to face-to-face situations.

The point of departure is the doctor–patient interaction in its traditional face-to-face environment, which we will conceptualise largely by drawing on Goffman's *interaction order*. Secondly, we draw on our empirical case, a digital platform that supports the remote follow-up of HIV patients. This example of digital-mediated clinical encounters demonstrates the conceptual challenge of updating classical interactionist assumptions. In order to approach the new forms of interaction afforded by the digital platform, we introduce Knorr Cetina's notion of *scopic media* and the literature on *affordances*. Before moving to the results section, data collection methods and the analytic approach are presented. Thereby, we elaborate how coding procedures of grounded theory – in the Strauss and Corbin (1998) tradition – were applied and connected with theoretical concepts in the quest for a framework for understanding the implications of platform encounters for the delivery of HIV care.

### Conceptualising the face-to-face interaction

The performance of traditional medical practice strongly relies on face-to-face interactions, where medical professionals become acquainted with patients' complex and often existential problems and apply their abstract knowledge in a particular way (Abbott, 1988). It is the specific quality of the interaction order (Goffman, 1983) that allows professionals to understand and negotiate the uniqueness of each patient, while, at the same time, subsuming their patients' problems under medical classifications and deliberate treatment options. To circumscribe the specific structure of the interaction order, Goffman (1983) referred to its spatial and temporal aspects as well as to the social and interactional activities involved. Using Goffman's framework, we can analytically elaborate three distinct but interrelated dimensions that constitute the doctor–patient interaction within the traditional face-to-face environment.

In the *spatial dimension*, Goffman (1983) suggests a body-to-body starting point to define the interaction order. In this way, doctor and patient are physically co-located in the intimacy of the

consultation room. This physical proximity creates an 'environment of mutual monitoring possibilities within which an individual will find himself accessible to the naked senses of all others who are *present*' (Goffman, 1964: 135, original emphasis). The embodied co-location in the consultation room creates an empirically rich space for experiencing visual body language, human voice, touch and smell. These social cues can be of central importance in conducting medical examination and consultation. Seeing, hearing and feeling the patient can reveal information over and above the linguistic content of the consultation.

In the *temporal dimension*, the interaction order is constituted through a concurrent time frame, which Goffman (1983) indicates as 'co-presence'. This notion implies simultaneity or co-temporality that is largely achieved through the embodied co-locality outlined above. Sharing co-locality creates a simultaneous centre of perception where 'individuals are admirably placed to share a joint focus of attention, perceive that they do so, and perceive this perceiving' (Goffman, 1983: 3). Co-temporality allows for immediate reciprocity that is constituted within the mutual synchronization of attention and actions. Thereby, doctors and patients can coordinate their activities and experience ongoing collaboration in real-time. It is particularly through synchrony and the reciprocity of inputs that the interaction is experienced as a shared event of mutual entrainment. Therefore, Goffman (1983: 2) acknowledges that the telephone call may be considered as a version of the 'real' face-to-face interaction, albeit a 'reduced version', because interlocutors – although not co-located – share co-presence.

Interaction is a genuine social situation that involves at least two actors in mutual entrainment. The *social dimension*, according to Goffman (1983), involves direct, personal contact that creates a dynamic situation of vulnerability and need for action. Doctor–patient interactions form a specific type of people-processing encounters that involve complex existential problems of clients and thus, can 'affect their life chances' (Goffman, 1983: 8). The sociology of professions has a long tradition in analysing how doctor–patient interactions produce an inherent tension between managing specific and diffuse aspects of social relatedness (e.g. Abbott, 1988; Merton, 1957; Oevermann, 1996; Parsons, 1951). Parsons (1951) emphasised a specific role relationship, where the patient seeks advice from a doctor who enacts clinical knowledge and technical skills to deal with the patient's problem. He considered emotional detachment and affective neutrality as important aspects to meet the responsibilities and expectations involved in this highly specified role relationship. In his critique of Parsons' analysis Merton (1957) acknowledged medical practice as a balancing act between incongruent expectations. From his view, the doctor–patient relationship requires some extent of emotional detachment which is complemented with a 'compassionate concern for the patient' and the attention to psychological and social circumstances (Merton, 1957: 74). These complex demands towards medical practice have been increasingly stressed by the patient-centred paradigm (Mead & Bower, 2000). This recognises the person behind the patient to account for a biopsychosocial perspective on health. Thereby, the social situation and the psychological state of the person are increasingly considered alongside biomedical aspects. This affords the formation of a therapeutic alliance between the health professional and patient and their engagement in a more diffuse social relationship (Abbott, 1988; Merton, 1957; Oevermann, 1996). To consider the person behind the patient within the doctor–patient interaction requires an open dialogue where a broad spectrum of topics can become relevant.

To sum up, medical practice involves complex and equivocal tasks, which traditionally were addressed in the 'rich' environment of face-to-face interaction (Daft & Lengel, 1986) that affords multiple cues, immediate reciprocity, and personal focus. Increasingly, however, digital technologies are introduced in care pathways and partially replacing face-to-face encounters. This we will illustrate in the following along our case example.

## Hybridisation of clinical encounters: the case of a digital platform to support patient follow-up

The case we draw upon to investigate and theorise the shift from face-to-face to digitally-mediated doctor–patient interactions is the EmERGE study (2015–20; [emergeproject.eu](http://emergeproject.eu)). Within this EU Horizon 2020-funded study, a digital health platform has been developed and implemented to support self-management and follow-up of HIV patients across five clinical sites (Barcelona, Brighton, Lisbon, Zagreb und Antwerp). The platform enabled patients' remote access to healthcare providers and blood test results. The EmERGE study combined an outcome-based quantitative evaluation (involving cost-effectiveness as well as clinical and patient-reported outcomes) with a formative sociotechnical evaluation, discussed in this paper. In the first phase of this sociotechnical evaluation, reported in previous publications (Marent, Henwood, Darking, & EmERGE Consortium, 2018a, 2018b), the University of Brighton collaborated with the European Aids Treatment Group (EATG) to engage patients, health professionals and IT-developers in a comprehensive co-design process and ensure user-centred design and implementation of the platform.

The integrated EmERGE platform now links hospital data sources through an application-programming-interface (API) to a clinical web application (CWA). On the CWA, doctors analyse blood tests of stable HIV patients and push results, clinical reviews and additional messages through a secure socket layer (SSL), without identifiable information, to a messaging server (cloud). The platform offers patients a smartphone application (app) through which they can securely request all blood test results along with doctors' reviews and messages from the cloud. Additionally, patients can view their upcoming medical appointments and their current medication and set appointment and medication reminders on the app. When enrolled in this digital care pathway patients see their HIV doctor just once a year – in the ‘naked’, unmediated face-to-face environment described by Goffman – with interim results and other information checked by the doctor and processed via the platform.

This specific form of digitally-mediated interaction and consultation was new to all five study sites and was intended to improve quality of life (e.g. reducing routine visits to clinics) and empowerment (e.g. instant access to data) for stable HIV patients as well as to increase the efficiency (e.g. workload of health professionals) of service provision. However, other forms of digitally-mediated consultations existed before the implementation of the EmERGE platform. In the study site in Barcelona, a ‘virtual clinic’ has been running for 10 years when the EmERGE study began. This offered patients and doctors secure videoconferencing software, accessible through personal computers, by which remote consultations could be performed. Instances of technical problems required doctors and patients at times to conduct the consultation through a telephone call instead of the videoconferencing system. By contrast, the study site in Zagreb had established remote telephone consultations since the centralised provision of specialised HIV care in Croatia requires many patients to travel long distances to visit their HIV doctor. Therefore, patients who perceived long journeys as not feasible were offered routine follow-up consultations over the telephone. Yet another different type of digitally-mediated interaction was offered at the Brighton study site where an email clinic enabled blood results and reviews to be sent to patients. In the Antwerp and Lisbon sites, before the integration of the EmERGE platform, consultations were conducted almost exclusively in face-to-face mode.

### Approaching platform encounters and their affordances

Our case is one among many examples that illustrate the increasing hybridisation of face-to-face and digitally-mediated clinical encounters, which are challenging health sociologists to rethink established

approaches to theorising doctor–patient interactions. Particularly in the current COVID-19 pandemic (Hollander & Carr, 2020), a substantial and increasing portion of clinical encounters are no longer conducted in joint territorial location of health professionals and their patients but through digital means that often employ platform technologies (such as APIs, interfaces, cloud servers, apps, etc.) to organise interactions.

Seminal theoretical advances to adapt our sociological understanding of interactional forms to their digital realm have been made by Karin Knorr Cetina (2009, 2014). Through ethnographic studies of interactions of traders in financial markets, she developed an understanding of what she terms ‘scopic media’ which transform Goffman’s ‘naked situation’ into highly immersive and information-alised interaction situations that allow for mutual conditioning and perception beyond situations of physical and temporal co-presence. Scopic media, according to Knorr Cetina (2009: 64), are ‘an arrangement of hardware, software, and human feeds that together function like a scope: like a mechanism of observation and projection, here collecting, augmenting, and transmitting the reality of the markets, their internal environments and external context.’ Scopic media offer a notion to capture the sociotechnical constellation of technological and visual components (e.g. the Reuters Screen of the trader) and human practices that mediate distant situations and enable participants to interact on a common platform. ‘By allowing otherwise remote things to be visually perceived together’, Knorr Cetina (2014: 43) emphasises ‘scopic media expand and augment local situations’. Scopic media are instruments for seeing and observing (the Greek term *scopein* means: ‘to see’) remote contexts and enabling distant forms of coordination and interaction.

Knorr Cetina acknowledges that scopic media appear empirically in heterogeneous ways, leading to different degrees in which interactions become informationalised and augmented. She explicitly pointed to telemedicine as an alternative example of scopic media to the electronic trading systems she studied (Knorr Cetina, 2014). In the following we argue that EmERGE platform can be understood as scopic medium, acknowledging the concept’s potential to be applied to distinct types of (health) platforms.<sup>1</sup> In the EmERGE case laboratories feed clinical databases with routine measurements of patients’ blood samples. A newly developed API adapter then allows doctors controlled access to this data and to process it on the CWA. The CWA acts as doctors’ instrument for seeing, collecting and projecting dispersed events (e.g. treatment history), objects (e.g. medication) and states (e.g. viral load) on-screen. The doctor composes the clinical review based on the represented, onscreen reality and selects relevant medical parameters (e.g. viral load, CD4 count, cholesterol, liver and kidney function) to be sent to the patient’s smartphone app. The app then becomes a further scopic element and acts as the patient’s instrument for seeing, providing technical features in a comprehensive display of one’s past and current health status that informs health practices. This scenario provides an example of how scopic media enable new forms of coordination and interaction that do not anymore rely on face-to-face encounters but, instead, create synthetic situations: ‘environment[s] augmented (and temporalised) by fully or partially scoped components – in which we find ourselves in one another’s and the scopic components’ ‘response presence’ (Knorr Cetina, 2009: 69). Response presence is a distinct form of presence, one that links remote persons through tangible artefacts (scopic media) that project dispersed objects (e.g. blood results) and actions (e.g. clinical review). In this paper, we draw on Knorr Cetina’s concept of scopic media to describe how clinical encounters in the digital, platform-based environment (as well as tele-interactive encounters through video and voice applications) differ from traditional, face-to-face encounters alongside spatial, temporal and social dimensions.

As we are interested in what these distinct interaction environments offer to health professionals and patients, what they provide and furnish for the delivery of care, either for good or ill (Gibson, 1979), this examination benefits from the addition of an affordance perspective. The notion of affordance was coined by Gibson (1979) to denote ‘action possibilities’ available in the environment.

While Goffman's and Knorr Cetina's theories help us to conceptualise the unique qualities of interaction in face-to-face and platform environments respectively, affordances can help us to understand the multidimensional relationship between these qualities and the practices and experiences that emerge thereof. In this way, Hutchby (2001: 444) defines affordance as a relational approach to understanding the use and perceptions of certain communication technologies, or, the 'functional and relational aspects which frame, while not determining, the possibilities for agentic action in relation to an object'. Thus, it is important to recognise agency and that 'affordances neither belong to the environment nor the individual but rather to the relationship between individuals and their perceptions of environments' (Parchoma, 2014: 361). Affordance, therefore, is not the quality/feature of a certain interaction environment nor its outcome. Rather, an affordance (e.g. reciprocity) allows to understand the link between a certain interaction environment (e.g. face-to-face encounter), its features (e.g. temporal: synchronous co-presence) and its outcomes (e.g. patient's experience of the quality of care). Furthermore, Evans et al., (2017: 40) stress the importance of conceptualising affordances based on variability: 'unlike features, they are not binary'. Thus, conceptualising an affordance such as 'reciprocity' on a continuum (e.g. high-to-low) allows for the comparison of interaction environments and observations of how, in platform-based, asynchronous interactions a certain degree of reciprocity may be practised (or not) through frequently exchanged messages. For this paper, we understand affordances as the multifaceted relational structure between interaction environments and their participants (doctor/patient) that enable or constrain potential practices in particular contexts. The affordance perspective enables us to empirically investigate how HIV patients and doctors relate to different interaction environments, the face-to-face encounter described by Goffman and the platform encounter conceptualised by the use of Knorr Cetina's scopic media.

## Recruitment and data collection

The data we draw upon in this analysis were collected throughout the second phase of the sociotechnical evaluation of the EmERGE platform, carried out between January and October 2018. In this phase, stable HIV patients and health professionals who have been using the EmERGE platform for more than 6 months were recruited. The aim was to assess the implications of the digital care pathway by understanding their experiences of the opportunities and restrictions – affordances – of different forms of doctor–patient interactions. With the support of clinical lead and patient community partners at each of the study sites, we recruited 72 patients and 32 health professionals. Of the 72 patients, only three were women. Sixty patients identified themselves as men who have sex with men, nine as heterosexual, and three as bisexual. The age range was 25–68 years (mean age 43.7) and the length of diagnosis of HIV ranged from 2.7 to 31 years. Fifty-nine patients were working or studying, two unemployed and 11 retired. From the group of 32 health professionals, 14 were male. Health professionals included 25 doctors, five nurses, one psychologist, and one pharmacist. In the analysis, we will focus on patients' and doctors' experiences because the EmERGE platform most significantly impacted their interactional practice, whereby the face-to-face consultation was reduced to once a year and the doctor would check interim blood test results on the web application and send information and messages to the patient's smartphone app.

Eight co-design workshops and 34 interviews were conducted with patients and 32 interviews with health professionals (for details on our co-design approach see: Marent et al., 2018b). Co-design workshops with patients were facilitated in the local language by a community partner, with BM and a member of the EATG joining discussions and activities by the help of an instant translator. Interviews with health professionals and most interviews with patients were conducted in English by

BM. Co-design workshops and interviews were audio-recorded and transcribed verbatim, and non-English transcripts were thoroughly translated. Participants provided written informed consent prior to the workshop/interview and patients received €25/£20 remuneration for participation. Study approval was obtained from the ethics committee of the University of Brighton, the National Health Service (NHS) Health Research Authority, and governance boards at each clinical site.

## Analytic approach

Data analysis followed coding procedures in grounded theory (Strauss & Corbin, 1998). The analytic process was iterative following several steps of open, axial and selective coding. Open coding involved a sequential analysis where data was broken down by assigning first conceptual labels. In the axial coding process, preliminary concepts were partially revised and established into categories. In this process, health professionals' and patients' accounts on various modes of interaction were mapped out within a heuristic categorisation of affordances. In the selective coding process, categories were enhanced and their relationships were explored. Inductively, this led us to a neutral labelling of each of the seven emerging affordance categories while exploring their contrasting manifestations on a high-to-low [+/-] continuum (Figure 1). Acknowledging that '[t]heory consists of *plausible* relationships proposed among *concepts* and *set of concepts*' (Strauss & Corbin, 1994: 278, original emphasis), we integrated our categorisation of affordances within the spatial, temporal and social dimensions of three distinct modes of clinical encounters. Goffman's interaction order and Knorr Cetina's scopic media were used to translate our empirical observations into a theoretical language for describing face-to-face (Figure 1, left side) and platform encounters (Figure 1, right side), respectively. The synchronous form of tele-interactions conducted through voice and video channels can be situated within the middle of Figure 1. This analytic approach recognises the role of contextual and theoretical knowledge for developing generative questions and guiding observations while acknowledging the

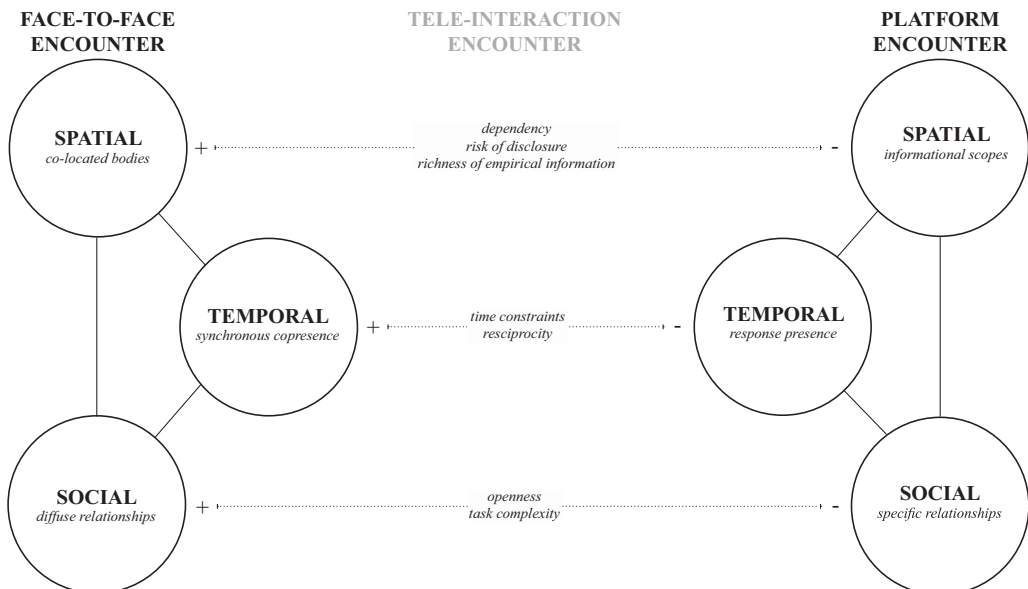


FIGURE 1 Dimensional framework of face-to-face, tele-interaction and platform encounters and affordances



openness of a research process that engages close with empirical phenomena and allows itself to be continuously surprised by data (Strauss & Corbin, 1994).

Data were primarily analysed by BM, but first concepts and categories were continuously negotiated with FH on a bi-monthly basis. Furthermore, preliminary findings were regularly discussed with the EATG, community partners and the whole EmERGE Consortium. NVivo 11 software (QSR International Pty Ltd) was used to support the management of the textual data and to organise the codes being assigned to the transcripts. To ensure confidentiality while quoting participants, pseudonyms were assigned in the following presentation of results: indicating participant number (P = patient; D = doctor), study site (by first two letters) and mode of data collection (ws = workshop, i = interview); for example, P135\_Ba\_ws.

## RESULTS

Quote #1: 'What I like about the [EmERGE] application is the anonymity and not having to take hours off from work for the face-to-face visit. The drawback about the videoconference is that it forced me to be at home with my laptop. I didn't take time off work to go to the hospital but to go home. The application is very convenient, very anonymous. You look at your mobile, check out to see if there is a message, and that's all. With my state of health, since I don't have any complications, ... with the app things are fine.'

[P135\_Ba\_ws]

The quotation above presents rich data for approaching the hybridisation of clinical encounters and to explore the experiences with the affordances of distinct interactional forms. We use it for a first step analysis, outlining how results will be presented. The 47-year-old patient (Quote #1) refers to clinical encounters that he experienced in the face-to-face situation as well as within environments mediated by videoconferencing and platform technology. Moreover, spatial, temporal and social aspects of the distinct forms of doctor–patient interaction are evident. The patient outlines spatial restriction of both the face-to-face and the videoconference encounter, which require physical presence at the hospital or at home, where the videoconference could only be accessed through a desktop or laptop computer. Physical presence in the 'naked' face-to-face environment can be reconstructed as a potential threat to privacy since the patient clearly emphasises the 'anonymity' afforded through the platform. In the temporal dimension, the platform is seen as 'convenient' because it eliminates travel time and the need to 'take time off from work'. However, the quotation also hints at restrictions of the platform encounter. The patient refers to his state of health and argues that because he does not have 'complications', the consultation through the app is 'fine'. This refers to the social dimension, in which, as we will outline below, consultations through the platform seem to be less able to initiate open dialogue in which the background of the patient can be assessed, and complex medical issues handled. The *relationality* of this platform affordance (Hutchby, 2001), however, is underlined by the patient, reasoning that with his current 'state of health' limits to open conversation are not experienced as significant restriction, but 'fine'.

This sketch of empirical data analysis should initially illustrate how we developed Figure 1, which provides an overview of the research results. The figure highlights three distinct forms of doctor–patient encounters in HIV care and specifies how our participants experienced their different affordances along spatial, temporal and social dimensions. On the left-hand side, it illustrates the theoretical notions to understand features of interaction in the face-to-face encounter and develops conceptual notions to describe platform encounters on the right-hand side. In the middle, the figure

lists seven affordances that reflect study participants' accounts of the opportunities and restrictions of face-to-face and technologically-mediated encounters. The notions used are neutral, while a high-to-low [+/-] continuum indicates how manifestations of these affordances shift from face-to-face to platform encounters. In the detailed analysis below, we will also highlight how synchronous modes of telephone and video calls, indicated as tele-interaction encounters, can be situated within the centre of the affordance continuum.

## Spatial dimension: from co-located bodies to informational scopes

Clinical encounters in face-to-face environments involve doctors and patients being physically *co-located* (Goffman) in the consultation room and, therefore, are location specific. Our participants perceived this spatial configuration as creating a form of *dependency* for HIV patients. As one patient outlined, Quote #2: 'the only thing that brings me to the hospital are the appointments. If you delete that part, I have my normal life or my old life back' [P124\_Li\_i]. Going to the clinic often included considerable efforts and was perceived as a constraint to engaging in other social activities. Patients outlined how much time they spent on travelling to the clinic and sitting in waiting rooms. Going to the clinic also required stigma management strategies. Patients had to explain at work why they had so many medical appointments and often had to come up with explanations that did not disclose their HIV status. Similarly, the bodily presence at the clinic was seen by some patients as a potential threat to their privacy and some patients mentioned that they chose a clinic located outside their immediate living environment to avoid the *risk of disclosure* by seeing people they know.

Videoconferencing and telephone consultations involved a 'respatialisation' of the clinical encounter (Andreassen et al., 2018). In this way, our participants elaborated how they had to 'negotiate space' (comparable to findings of Janssen et al., 2020) to avoid *risk of disclosure* in synchronous tele-interactions. A 41-year-old patient described how he experienced a call on his phone as more spatially sensitive than receiving and managing information within the app:

Quote #3: 'I do have my office ... but in every minute somebody could enter, somebody could hear it ... but when I'm having my phone in my hand [using the app], nobody sees, nobody can hear it ... it's my private space.'

[P107\_Za\_i]

The oral language used in tele-interactions along with the technical features of the videoconferencing tool, which was only available through desktop or laptop computers (that are not as compact as smartphones; see Quote #1), made this mode of interaction 'location sensitive' with many patients preferring to conduct these consultations from their homes. Therefore, tele-interactions did not enable the complete elimination of spatial restrictions and *dependency*.

Through the digital platform, consultation is no longer confined to physical territories and moves into *informational scopes*. These afford a different type of coordination through 'mechanisms of projection that aggregate, contextualize, and augment the relational activities within new frameworks of understanding' (Knorr Cetina, 2014: 43). The scopic media collects dispersed accruing information within a centralised system for monitoring and perception. It is a dynamic 'patchwork of parallel, itemized flows' (Knorr Cetina, 2009: 72) that displays patients' health status on-screen as running lines of texts, numbers, figures and graphs. Thereby, medical knowledge and practices of patient follow-up are no longer bounded to territorial location (e.g. consultation room) but ubiquitously

accessible in informational space. The possibility of accessing medical information from any location was perceived as an important step towards decreasing HIV patients' *dependency* on the clinic and thus, another move towards the 'normalisation' (Mazanderani & Paparini, 2015) of living with HIV:

Quote #4: 'where I am now with this app, I don't really have to rely on people to go and see to get the results to tell me I'm okay, you know, and it feels liberating in that respect. So, for me in owning it now, I can deal with it independently of other people.'

[P100\_Br\_i]

Similarly, doctors recognised that HIV treatment has become much easier as most patients are stable on treatment and do not require much input from them. Thus many doctors were in favour of using the platform as a tool to reduce visits to the clinic and saw this as a way to improve the quality of life of HIV patients or a form of 'de-medicalisation' as a doctor in Brighton emphasised, Quote #5: 'We're medicalising people and they don't need to be here if they don't want to be here' [D67\_Br\_i].

Another affordance of digitally-mediated interactions is that they seemed to gradually reduce the *risk of HIV status disclosure*. We have already outlined how the bodily presence in face-to-face environments was perceived as a considerable threat to privacy of HIV patients. Also, synchronous tele-interactions required some negotiations of privacy whereby patients had to select adequate spaces where videoconferences and phone calls could not be overheard (Quote #3). While we found considerable privacy concerns towards the platform from non-users prior to implementation (Marent et al., 2018a), users interviewed in Phase 2 of the sociotechnical evaluation largely considered the platform as a secure space to inform themselves about their condition (Quote #1), expressing trust of the data protection and management measures.

The body-to-body situation affords a multiplicity of symbolic cues such as gestures, words, smells and touch. This *richness of empirical information* is becoming gradually reduced in mediated interactions. Yet, synchronous tele-interactions such as videoconferencing afford the audio-visual perception of interlocutors, and a doctor explained how these affordances created a similar experience to the face-to-face environment:

Quote #6: 'voice is a very unique characteristic of the person, face as well, so you don't lose some characteristics. It's more or less the same as a personal visit because you have the patient on the other side of the table, more or less the same, you don't lose many details.'

[D86\_Ba\_i]

Although the videoconference tool almost reproduces the primordial face-to-face situation, some details are lost. Thus, doctors argued that identifying symptoms in a video consultation requires additional effort and both doctors and patients outlined that physical examination (e.g. blood pressure, weight) are not facilitated in the virtual environments they have experienced. In platform encounters, bodies fade into the comparatively leaner technical display of the *informational scope*, further narrowing the opportunities of identifying symptoms. In this respect, a doctor emphasised:

Quote #7: 'the disadvantage for not using face-to-face or people walk in the door and actually realise that they've lost 20 kilos and there's something seriously wrong which you won't realise from a mobile phone app.'

[D70\_Br\_i]

## Temporal dimension: from synchronous co-presence to response presence

Both face-to-face and tele-interactions are based on synchrony which requires co-presence, albeit in different ways. Our participants often outlined how synchrony can create *time constraints*. The embodied co-presence of the face-to-face encounter requires patients to travel to the clinic and wait for their appointment. One of the significant changes of the platform encounter was that it afforded lower time constraints for patients to conduct their clinical consultation. Quote #8: ‘What has changed is that instead of going into the waiting room and waiting in the queue I have it all here [patient pointing to the smartphone app]’ [P136\_Ba\_ws]. Also in synchronous tele-interactions, doctors and patients must share a mediated co-presence, which was at times not easy to achieve. In this way, patients often outlined how long they waited for the videoconference to start or how difficult it was to reach their doctor by phone. Quote #9: ‘before the app ... it would take days to get through on the phone, and it was a waste of time’ [P106\_Za\_i]. Similarly, a doctor outlined how their work was, Quote #10, ‘fragmented, interrupted constantly by phone’ and that the digital platform helped ‘to better structure some parts of the job’ [D98\_An\_i]. Through the platform, interactions became formed along with asynchronous but linked activities where health data are being collected, analysed, commented upon and sent by doctors and then, received, interpreted and used by patients in practices of self-managing HIV. Knorr Cetina (2009: 74) elaborated the notion of *response presence* to describe such forms of interactivity where interacting parties do not need to be co-present but find themselves in new ways ‘accountable for responding without inappropriate delay to an incoming attention or interaction request’. Response presence allows participants to be capable of creating a shared event (e.g. clinical consultation) and informing one another, without sharing physical location or concurrent time frames. Doctors often outlined how asynchrony offered more flexibility and opportunities to structure work allocation. Many doctors allocated specific times in their work week for consultations through the digital platform and some argued that it was more efficient and, Quote #11: ‘freeing up time [for] people who have more need’ [D68\_Br\_i].

However, *reciprocity* was considerably restricted in encounters on the EmERGE platform. Doctors often raised concerns that they do not know whether a patient has actually received or read the message and suggested ways to further develop the platform in this respect (e.g. including read confirmations). The lack of a shared time frame can also hamper the coordination of actions and some patients argued that in the case of urgent and uncertain problems they required synchronous modes of interactions:

Quote #12: ‘So, in that situation when I was running out of medication, if I had to text, for me personally I get reassurance from hearing a voice, that I’ve contacted somebody. Whereas if it was just texting and getting texts back, I think I might feel a little bit disconcerted, you know, be a bit, sort of, raise maybe anxious levels in me.’

[P100\_Br\_i]

In the case of platform encounters, the response presence has to be negotiated and organisational policies developed that specify in which situations message exchange is an appropriate communication tool and when a response can be expected. It was particularly the capability of responding to one another and sharing experience in real-time that created feelings of closeness and reassurance in synchronous forms of interaction (face-to-face and tele-interactions). Yet, the distinction between synchronous and asynchronous interactions can be blurred through sociotechnical practices. Some studies have shown that, for example, message exchange on mobile phones can be perceived as ‘near-synchronous’ because quite immediate response is normatively expected by users (Håland & Melby, 2015; Rettie, 2009). In similar

ways, patients in this study strongly requested more intense forms of two-way interactivity to be built into the sociotechnical infrastructure of the EmERGE platform.

## Social dimension: from diffuse to specific relationships

In the social dimension, the mediatisation of clinical encounters was perceived as a considerable challenge to some medical professionals.

Quote #13: 'Just like they [patients] need it, I need it as well, that's the reason why I'm a doctor, because I'm interested in the person who is in front of me, even when we are talking about non-medical things, but still you learn a lot about the background of the patient and that can be useful.'

[D89\_An\_i]

The doctor indicates that through the platform the core of his professional identity and what is considered as 'good care' is put into question. Medical practice understood as people-processing encounter (Goffman, 1983), strongly relies on the formation of a therapeutic alliance with the patient that includes the consideration of both specific medical topics and more diffuse personal issues of the patient (Abbott, 1988; Merton, 1957; Oevermann, 1996). A patient illustrated how he valued the close relationship with his doctor and how this relationship contributes to good care:

Quote #14: 'that human interaction to me is important, that empathy, that understanding ... the consultant that I see has seen me through quite a lot of difficult times, he knows the history ... it was very helpful for me, if I came in with an issue ... he sort of understood where I was coming from and I didn't have to sort of explain it all over again.'

[P104\_Br\_i]

Both doctors and patients outlined that, from their experiences, the EmERGE platform did not create the same *openness* as the face-to-face situation. The EmERGE platform was experienced as lean in terms of media richness (Daft & Lengel, 1986), not necessarily supporting the reduction of equivocality in situations when complex problems were experienced. The platform did not convey non-verbal cues but was used to send short messages, focussed solely on specificities of biomedical measurements. Several patients emphasised how they required 'human touch' in situations where they felt anxiety or uncertainty and doctors argued that patients are more likely to open up and talk about side effects or personal issues, Quote #15: 'if they are given proper space and time in this face-to-face contact' [D78\_Li\_i].

Through the EmERGE platform, interactions became more formalised and directed towards a highly *specific role relationship*. This also resonates with the findings of Pols (2011) who outlined that webcams were concentrating consultation activities and making them focussed on the task at hand. In the EmERGE project, the platform did not afford opportunities to convey the person behind the patient (Mead & Bower, 2000) and some doctors argued that the unique person is subsumed under a generic case, whereby patients are likely to become reduced to biomedical measures or 'numbers' as Quote #16 indicates: 'Only when I see a face often I remember who the patient is. Now, with EmERGE, the contacts are less frequent even, so people become numbers, so I don't like it that much' [D94\_An\_i]. The principle of openness, where a range of topics can be raised in face-to-face interactions, became significantly reduced by a more rigid focus on the biomedical measures that are important for HIV monitoring (e.g. viral load, CD4 count, cholesterol, liver and kidney function). Doctors sometimes

elaborated how they developed templates to make their platform consultations with patients more efficient. Quote #17: ‘most of our messages are templates’ [D75\_Za\_i]. Doctors further outlined how they were required to learn new skills in writing text messages. Writing messages was sometimes perceived as more difficult than an oral conversation because there are no possibilities to change the message once it was sent and because of limited reciprocity doctors had to anticipate how patients would understand and deal with the message:

Quote #18: ‘when you write a note about the lab results then you are more careful, you know, compared to the oral presentation of the results, then you find that you need to address everything that’s above normal when you do it in writing, otherwise the patient might ask you: “I saw the normal ranges and this is ... above the range and you didn’t comment it”. So, I sort of perhaps even do a little bit more commenting now than I do on the phone. On the phone you just say, you know, everything is okay.’

[D73\_Za\_i]

Doctors largely agreed that a consultation through the EmERGE platform was only appropriate for the performance of routine tasks with stable patients. They argued that they do use the platform only for patients that are stable on treatment and with whom they have already built a relationship through a period of face-to-face consultations. Doctors strongly emphasised the indispensability of face-to-face interactions for cases where *task complexity* is considered high:

Quote #19: ‘some people need help with their drug and alcohol use, and you can’t necessarily pick that up if they’re just using their mobile phone app to run their health. There’s a lot of denial, certainly amongst gay men injecting drugs ... and unless you confront them directly, sometimes it’s really difficult to implement any sort of intervention to support them. And they might hide behind something like EmERGE.’

[D70\_Br\_i]

Because doctors strongly advocated (in the co-design of Phase 1, see Marent et al., 2018a, 2018b) that complex medical treatment and consultation relies on face-to-face interactions, only stable HIV patients were offered the digital care pathway. Yet, in the case of complications, doctors circumvented the platform and switched to tele-interactions and face-to-face interactions:

Quote #20: ‘if I have something wrong with the blood test, I cannot send a message ... I have to go call the patient and say: “Hey, you have to come by because you have something in your blood test that we need to talk about ... you have to come back.”’

[D87\_Ba\_i]

Doctors were aware that, in the case of complications, patients require an environment of support and should not just receive a result on the app. According to our participants, face-to-face encounters facilitate open dialogue and the negotiation of complex tasks.

## DISCUSSION

The sociology of health and illness has been investigating the hybridisation of doctor–patient interaction since the introduction of telemedicine in the early 1980s (Andreassen et al., 2018; Lupton

& Maslen, 2017; Marent & Henwood, 2021). The focus of most of these studies has been synchronous forms of interaction (provided through telephone lines and videoconferencing systems) which Goffman (1983) acknowledged as versions of the primordial real face-to-face interaction. Platform encounters are significantly different in their factual (how information is generated and shared), temporal (how reciprocity is framed, and actions are linked) and social (how participants' ambiguities, and case complexities are approached) configuration.

Theorising platform encounters, we outlined how new spaces for medical follow-up and consultations are being configured. Within informational scopes (Knorr Cetina, 2009, 2014) the observation of patient bodies and the monitoring of health status and treatment adherence is decoupled from the specific localities of clinics. Instead, connected computer systems, software and interfaces are used to visualise information on-screen, perform clinical analysis and provide consultation to remote patients. The informational scope creates a centre of perception through which doctors and patients can refer to a jointly experienced environment, which is continuously being updated to display current medical information on demand. This spatial configuration of the platform encounter potentially affords HIV patients increased autonomy and privacy while avoiding physical visits to the clinic. These affordances, however, have to be carefully assessed in relation to patients' competences in accessing and interpreting information provided through platforms (Marent et al., 2018a) and data protection and security measures built into these systems (Blasimme et al., 2018). Impoverished by the human body, platform encounters can lose an immense source of information, proving a significant challenge for medical assessments in the context of HIV care. Several doctors in our study have outlined how a comprehensive consultation requires professionals to complement medical measures configured through the scopic medium with the sensory information gathered through face-to-face interactions with patients. Rather than replacing face-to-face interactions, platforms were seen as an important addition to patient follow-up in HIV care. Professional discretion will be required for assessing which patients could take benefit from participating in specific configurations of digitised care pathways.

Scopic media are temporalising the clinical encounter and widening possibilities for coordinating actions and interchange. Through modes of response presence (Knorr Cetina, 2009, 2014) they allow doctors and patients to monitor and respond to one another (e.g. messages), objects (e.g. prescriptions), and events (e.g. missed appointment) regardless of co-presence. This affords new ways of structuring work practices within the clinic and new time-efficiencies for both doctors (e.g. less time to perform consultation) and patients (e.g. reducing travel and waiting time). Although platforms can be used to produce highly immersive and reciprocal sociotechnical relationships (Piras & Miele, 2019), EmERGE users experienced restrictions. Doctors were concerned that the platform did not indicate if and when a specific information or message was read by a patient, who, while not 'being there', should 'be aware' (Grabher et al., 2018) and able to respond through taking appropriate action (e.g. booking a blood test). Many patients, on the other hand, requested more opportunities for getting in touch with doctors and exchange messages between booked appointments. These results of our sociotechnical evaluation led to IT-developers integrating new functionalities (e.g. more comprehensive two-way messaging and videoconferencing systems) within the platform. However, such functionalities have significant organisational implications in terms of workflows and resources and were positioned as optional and for clinics to decide if and when they are ready for implementation. Platforms, can enable operations to be always-there and thus the potential for immediate support at any time and outside pre-booked clinical appointments (Tucker & Lavis, 2019). This, however, requires organisational efforts and resources to be adopted in practices and wider care infrastructures (Langstrup et al., 2013).

Scopic media are shaping and being shaped through sociotechnical practices, producing new forms of relationships. The CWA and smartphone interface of EmERGE, for example, enabled the

exchange of specific data and small amounts of free text. Such technical platform features and the practices of their use are constitutive for the doctor–patient relationship and the delivery of care. The way the EmERGE platform was implemented and used was seen as adequate substitute for face-to-face encounters in unequivocal health situations (e.g. stable on ART with no side effects) with specific information needs (e.g. if viral load is undetectable). In the case of urgencies (e.g. running out of medication) and ambivalences (e.g. how certain symptoms may be related to HIV condition), however, participants required a richer interaction environment (Daft & Lengel, 1986) and often described how they circumvented the digital pathway by calling-in or visiting the clinic. Participants raised further concerns that they do miss human touch, providing evidence that the balancing of diffuse and specific components within doctor–patient relationships shifted towards the latter (Merton, 1957; Oevermann, 1996). In this way, several doctors outlined how patients' faces and voices vanished behind informational screen projections and interaction was focussed upon the interpretation and communication of biomedical measures. Similarly, some patients were concerned of being subjected to standardised default while receiving short messages, often not indicating if it was 'their' doctor – whom they trusted through long-built relationships – who wrote the message. Quite different findings, however, have been revealed by Piras' and Miele's (2019) recent study of type 1 diabetes, outlining how platforms can result in digital intimacy that strengthen the social relationship between patients and health professionals. While technical features can be continuously advanced to make clinical platforms less impersonal (e.g. picture heading indicating interlocutor), it is the particular organisational arrangements (e.g. continuity of encounters) and the practices of use (e.g. more informal chats, involving emojis) that shape the ways in which platforms facilitate collaborative relationships. The increased utilisation of platform encounters is reconfiguring our understandings of good care and will require increased attention to the development of professional skills in the technical as well as social operation of scopic media. Reflexive sociotechnical practices may yet create potential for scopic systems to become richer media that can enable the expression of social cues, the facilitation of patients' life-world experiences and the maintenance of mutual commitment (Håland & Melby, 2015).

## CONCLUSION

In this paper, we introduced Knorr Cetina's notion of scopic media to develop an extended conceptualisation of the clinical encounter that captures current hybridisations of care delivery. The notions of informational scope and response presence enabled us to approach new ways of knowing and reciprocity enacted in platform encounters and to explore respective implications for the doctor–patient relationship. Therefore, this framework is intended to stimulate further research on how new interactional forms between health professionals and patients may reconfigure roles and responsibilities as well as wider structures of digital society. Furthermore, by comparing how affordances play out between different forms of clinical encounters, the framework can guide practical reflections on when and how different consultation types may be integrated and can complement each other within care pathways.

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## AUTHOR CONTRIBUTION

**Benjamin Marent:** Conceptualization (lead); Data curation (lead); Formal analysis (lead); Writing-original draft (lead); Writing-review & editing (lead). **Flis Henwood:** Conceptualization (equal); Formal analysis (equal); Funding acquisition (lead); Writing-original draft (supporting); Writing-review & editing (equal).

## DATA AVAILABILITY STATEMENT

For privacy and confidentiality reasons, research data are not shared.

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## ENDNOTE

<sup>1</sup> We recognise that the term platform has different connotations and can describe markets (economic literature), forms of organising (organisation studies) or technological artefacts (engineering design) (Gawer, 2014). While not commodifying user data (as other platforms studied in the digital health literature), EmERGE can be understood as platform in the way it is organisationally implemented to generate new routines and structures that are utilising technological infrastructure to adapt service delivery to environmental pressures (increasing demand of services, stagnating financial resources).

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