Global eHealth
Designing spaces of care in the era of global connectivity

Vincent Duclos

Abstract

Using the case of the Pan-African e-Network, this Think Piece describes some of the practical and theoretical challenges presented by eHealth. At the junction of 'networked thinking' and clinical work, human lives come to matter in new ways, taking shape as objects of knowledge and intervention. The terrain on which this is happening is discursive, and deeply enmeshed with living and technical systems. Studying eHealth reveals how contemporary arrangements create new spaces in which lives are cared for. As such, it is inseparable from wider questions being raised by global eHealth practices: How are spaces of care to be designed in the era of global connectivity? What are the emergent relations between space, information technology, and the government of care on a global scale?

Keywords

Networked thinking, or the everywhere-ness of healthcare

Global health is being transformed by a proliferation of screens, interfaces, and networks – infrastructures that link bodies, knowledge, and care practices in new spatial and temporal configurations. These connect patients, medical practitioners, hospitals, and laypeople, either through private networks or the Internet, and affect the circulation of medical knowledge, expertise, and data. From network science literature to everyday public health settings, digital connectivity has become highly correlated with access to care and protection against health-related risk.

eHealth champion Gunther Eysenbach (2001, e20) famously argued that eHealth is 'not only a technical development, but a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking'. Such an 'attitude' translates into especially high expectations regarding network connectivity and its impact on global health. eHealth has been referred to as the 'next breakthrough in health systems improvement in developing nations' (Gerber et al. 2010); '*a* great equalizer between rich and poor, healthy and ill*'* (Rockefeller Foundation 2010, 51); and a 'life-saving tool' (Vital Wave Consulting 2012).

The notion of eHealth as a 'game changer' in global health is directly linked to a vision of the digital, connected clinic, with its instant availability, synchronicity, and 'everywhere-ness' of health data, information, and, ultimately, care. In such a clinic, network connectivity is expected to reduce the amount of both economic and energetic expenses required to access medical care and expertise. It is expected to render distance meaningless and to break down barriers to the provision of health care (Mort, May and Williams 2003; Bashshur and Shannon 2009). In a world where people are apparently 'dying for lack of knowledge' (Global Healthcare Information Network 2014), this envisioned digital clinic is anticipated to 'reach out and heal someone' (Cartwright 2000), no matter where they are physically located.

The suggestion that digital networks reduce obstacles related to distance is not unique to eHealth. Over the last few years, the 'death of distance' and the arrival of postgeographic realities have been extensively announced in various academic and institutional circles (Cairncross 1997; Robins 1997). This has been greatly influenced by recent modeling tendencies in network analysis and practice, exemplified by the 'new science of networks' (Buchanan 2002; Barabási 2003). Building on graph theory in discrete mathematics, for example, proponents of this 'science of a connected age' (Watts 2003) suggest that networks instantiate universal laws in a wide range of contexts, from business organizations to disease epidemics. Following this logic, the development of large networks would then be governed

by robust self-organizing phenomena and generic mechanisms for growth (Barabási and Albert 1999).

More skeptical observers have insisted that even though network scholars call attention to connections, they tend to conceptualize those connections in a static form (Mackenzie 2010, 9). Galloway and Thacker (2007), for example, argue that this way of thinking sees networks geometrically, as existing on a plane in which various entities (data, diseases, humans, etc.) are connected. This homogenous, flattened notion of space (and indeed of networking) is central to what Eysenbach articulated as 'networked thinking'.

I argue that 'networked thinking' – with its peculiar conception of networks and information – is concretely incorporated and stabilized in entanglements of projects, services, locations, things, and figures (Moser and Law 2006). Yet the relation between the concrete emergence of networked spaces and the dominant narratives about those networks should not be understood as isomorphic or causal. There are divergences between how we come to envision networks and the processes through which networked spaces are rendered operational. In a way, this Think Piece may be read as a conceptual exploration of such divergences.

Emergent objects of knowledge and intervention

In September 2004, Abdul Kalam, the former president of India, proposed to connect Africa and India through a network aimed at providing healthcare services. Five years later, the Pan-African e-Network Project was launched. I stepped into the network's eHealth studios for the first time just a few months after the project began, and conducted field research on this colossal, multifaceted eHealth network for more than a year. The Pan-African e-Network connects more than thirty health centres located across the African continent with twelve tertiary hospitals in India, primarily to provide medical teleconsultations. These consist of real-time videoconference sessions between Indian specialists and their African colleagues, in which they discuss patient cases, clinical impressions, probable diagnoses, and advisable treatments. It is, overall, an integrated solution aimed at taking care of patients at a distance.

The primary aim of my research was to understand how the network reconfigures the distribution of medical knowledge and transforms the space of the modern clinic or hospital. The clinic, argues Michel Foucault in *The Birth of the Clinic* (1973), is to be understood as a site of validation for modern objects of knowledge and intervention. It is the site of emergence of a medicine that is given and accepted as positive. The clinic is comprised of a

series of discursive, technical, and medical practices that bring human lives into the reach of empirical knowledge. Foucault describes the moment the individual body becomes an object of medical examination and analysis, and shows that the way we conceive, see, and speak about humans is contingent on the 'sensorial economy' of the clinic and most specifically on the 'medical gaze'.

Teleconsultations engender new clinical spaces, with their own epistemological and therapeutic qualities. In the case of Omar, a Senegalese man with heart problems, pediatric cardiologists from Fortis Hospital in Delhi assisted their colleagues at Fann Hospital in Dakar with installing a pacemaker. In another case, the treating team in Dakar decided not to operate after they assessed the risks with Indian neurologists familiar with similar cases. At some participating hospitals, teleconsultations have become a crucial part of the 'diagnostic ritual' (Saunders 2008).

My study of the Pan-African e-Network showed that network connectivity transforms the medical gaze. Dr. Ndiaye, the head of the neurology department at Fann Hospital, sums up the impact of teleconsultations in this way: 'The network broadens our vision. It opens it up to all sorts of possibilities in terms of diagnosis and therapy'.

During teleconsultations, doctors review medical records, and scroll through and comment on scanned images. In contrast with the practices of seeing, hearing, and touching bodies that characterize the modern clinic (and bedside care), teleconsultations take as objects bodies that are screened, digitized, and transmitted over the network. These bodies are simultaneously present and absent, concrete and virtual. This is a dispersed, emergent medical gaze, with its own 'sensorial economy', or distribution of the visible and the invisible. The space of the body becomes the site, simultaneously contained and porous, of remarkable information flows. The criteria upon which a body becomes the object of the medical gaze is no longer the mere expression of a localized illness but its communication over great distance. In dissolving the walls of the clinic, the network points towards new ways that bodies become objects of knowledge. This does not mean that disease is no longer spatialized within the solid, visible, individual body – the 'mappable territory' of disease described by Foucault (1973, 149). But it does suggest that the medical gaze is no longer confined to the physical space of the clinic, of the hospital.

While ostensibly meeting the main goals of the project and indeed with eHealth – to provide access to medical information and care, regardless of distance and physical location – the walls of the clinic do not simply dissolve, allowing information and care to freely flow. Rather than a straightforward emancipation from physical distance, my research suggests that the dissolution of the clinic is conditioned by relations to a multitude of heterogeneous,

outside forces – economic, political, technical, and medical – felt as necessity or material constraint. Through the network, economic and biological lives are expected to strengthen each other, as the world becomes a global clinic. These expectations are concretely incorporated into the network's design and daily operations.

Designing spaces of connected care

The Pan-African e-Network has a vibrant economic and political life. It benefits from extensive media exposure, and its premises are often visited by political figures. After all, like its slogan proclaims, the project is 'a shining example of South–South cooperation'. A bold technological enterprise, the network relies on a transnational nexus of landline and satellite connectivity, connecting sites in more than thirty countries. It illustrates a revival of Indo-African trade and cooperation, with a specific emphasis on healthcare (Duclos 2012, 2014). Funded by the Indian state, the public–private partnership was designed as a 'win–win scenario': African patients gain access to valuable expertise while Indian hospitals increase their presence in relatively untapped markets.

During the course of this research, I was repeatedly reminded that the Pan-African e-Network project is intended to be delivered as a 'turnkey solution'; health care sites should be able to participate without having to modify it for local circumstances. The network is a private and centralized infrastructure, monitored day-in and day-out by its implementing agency, Telecommunications Consultants India Ltd (TCIL). It was designed to be operational in potentially precarious conditions, such as hospitals with an unstable power supply, poor telecommunication facilities, or skilled labour shortages. As far as connectivity is concerned, satellite technology is the cornerstone: easy to install, it requires no wiring and thus provides a tailored solution to rapidly connect many sites, regardless of their remoteness.

Satellite bandwidth is provided by the RASCOM satellite, the first African satellite telecommunication system covering the whole continent. As it is built into the Pan-African e-Network's design, satellite connectivity stands as a metaphor of disembodiment, of placeless space. This recalls the description given by Peter Redfield (2000, 112) of satellite technology in *Space in the Tropics*: 'Space technology closed the sky again, bounded it from above and sealed it whole. … At last the world was one'. Similarly, as the network expands through space, the roundness of the Earth is expected to transmute into some kind of unified totality, or global embrace: a '"new and sustainable" global human habitat' (Pelton 1999, 5). Or, in the words of one of the lead designers of the Pan-African e-Network, a former scientist at the Indian Space Research Organisation, the network is a 'digital

ecosystem facilitating seamless flow of clinical information from any point of generation to any other point of evaluation'.

While satellite-based connectivity enables many dispersed hospitals to implement the program in a short time frame, this risks confusing the connected hospitals with indistinct, interchangeable sites. This confusion has consequences, which are best illustrated by the low utilization of the services offered. By the end of my ethnographic fieldwork, three hundred teleconsultations had occurred using the network. This is very little compared to the network's capacity and the availability of the participating Indian hospitals. My ethnographic examination of this project suggests that, while many factors contribute to this situation, low utilisation ultimately reveals that the project is unable to overcome the particularities of its sites. As the head of the Cardiology Department at Fann Hospital, in Dakar, explained: 'Underutilization exists because there is a mismatch in the process. Right now, it is we who must innovate to adapt the project in our context'.

The problem is not only that local contexts were not taken into consideration when the network was designed. It is also that the network was conceived as a sort of 'inner space', relatively self-sufficient and transposable. This is illustrated by the spatial architecture of the project. For example, in every participating hospital the site of the Pan-African e-Network occupies a peripheral position. The network's studios are not integrated within care units, but are secluded in reserved spaces equipped with medical devices, computer equipment, an uninterrupted power supply, and an air conditioning unit. The project thus comes with a 'mobility kit', designed as a means for stable, lasting network operability. While this turnkey approach ensures uniformity across the network, it results in an overdetermined project, caught off-guard by the widening gap between the initial expectations and the way things are unfolding in practice.

Underneath the uniformity of the project design is a vision of the network as a flat surface upon which entities – data, medical knowledge, patients, etc. – are expected to circulate. The network was designed according to an anaemic conception of space, one that reduces all things to geometrical forms, for instance, reducing connected sites (hospitals) to nodes on the network's map. Far from being just an analytical framework, 'networked thinking' has concrete consequences on the efficacy and viability of a network like the Pan-African e-Network.

Ethnographic inquiry exposes a whole series of entanglements and asymmetries between the network as anticipation (the project) and the network as it is felt and experienced. Put simply, the spaces engendered by the Pan-African e-Network do not emanate from some inner core, globally expanding to transform local sites. They emerge through a series of

situated, immanent practices, at the intersection of network design and implementation, and medical work. These include medical rounds and staff meetings, network maintenance, budgeting, and border clearance processes. In other words, ethnographic inquiry challenges us to not think about spaces of care and protection in linear terms, namely, to start with a mental image (a project) and then apply it to inert matter. We are prompted to question the idea that networks are a means towards specific ends. Hence, Eysenbach (2001) was right when he claimed that eHealth is not only a technical development, but a commitment to 'networked, global thinking'. However, to keep intact its vision of a picture-perfect, even space, this 'thinking' comes with a high price: systematically disregarding the very conditions enabling the deployment and stabilization of networked spaces. This has significant implications as far as the viability of a project like the Pan-African e-Network is concerned.

If processes of becoming are emphasized over static being, a critical question for designers (and ethnographers) of eHealth networks may be: how can technical objects such as eHealth networks transform themselves in order to acquire functions that go beyond the expectations that went into their initial design?

Conclusion

Driven by the leadership of the World Health Organization, local governments, NGOs, and private sector players, the last few years have witnessed a flourishing of global eHealth studies and practices, a field with its own discourses, scientific statements, vested interests, and moral propositions. The World Health Organization's (WHO 2005, 2010, 2011a, 2011b) intensifying investment in eHealth is revealing in this regard. These developments translate into a steep increase in the use of ICTs to provide health-related services in the Global South (ITU 2008). In natural disaster and war zones, in humanitarian settings, or as part of broader development policies, eHealth networks are being implemented. Networks provide services such as remote diagnostic solutions (Nsehe 2012), health information to patients and lay persons (WHO 2011b), teleconsultations between practitioners (Wootton 2008), and text-message reminders of follow-up medical appointments (Liew et al. 2009; WHO 2011b).

The deepening enmeshment of ICTs and global health is also reflected in a sharp increase in the number of digital networks aimed at public health surveillance (Calain 2007). From the seasonal flu to the Ebola epidemic outbreak, networks aimed at monitoring population health have been multiplying at a rapid rate over the past decade. As a recent report by the World Health Organization summarized: 'Attention to health information systems has never been greater in the history of global health' (WHO 2011a, 5).

But beyond the design and expectations of these networks, eHealth concerns the remote production, or '*engendrement*' of the human by humans (Foucault 2001 [1980], 893). This is, however, not a linear movement towards predefined ends or products because *engendrement* is a conflictual process in which the forces within us enter into a relation with 'forces from the outside' (Deleuze 1988, 124): forces of death, as in *The Birth of the Clinic*, but also of information technology in the case of the Pan-African e-Network.

This brings us back to the spatiality of networks and, more specifically, to the processes through which connected spaces of care are engendered. A crucial task for social studies of global eHealth networks and practices is thus to map how eHealth devices shape, generate, and distribute knowledge in ways that encode and reinforce existing relations, to document how they are enmeshed in a multitude of force relations, mobilities, and strategies aimed at the government of human life. It is to crack the seamless surface of digital spaces, loosening up the relations between certain modeling tendencies and the 'thingness of networks' (Munster 2013, 15). In other words, it is to think through the practices and historical events that shape global eHealth networks in all their turbulence, splendor, and inadequacy.

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About the author

Vincent Duclos is a medical anthropologist currently pursuing postdoctoral research as a Fernand Braudel Fellow at the Anthropology and Global Health Chair of the Collège d'études mondiales in Paris. His research examines the transformation of global health under the influence of information and communication technologies. It is concerned with how digital connectivity forges new relations between space, technology, and the government of human lives on a global scale. The author has conducted field research in India, Senegal, and Burkina Faso.

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