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From human-centric digital health to digital One Health: Crucial new directions for mutual flourishing

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Abstract

This brief communication puts forward an argument for expanding the concept of 'digital health' to that of 'digital One Health' by going beyond a human-centric approach to incorporating nonhuman agents, including other living things, places and space. One Health approaches recognise the interconnected and ecological dimensions of human health and wellbeing, but rarely focus on the role of digital technologies. A set of key questions can take the idea of digital One Health forward: (i) How can we learn more about and establish deeper connections with other animals and the natural environment through digital media, devices and data?; (ii) How can we attune humans to these more-than-human worlds using digital technologies, cultivating attentiveness and responsiveness?; (iii) How can we better develop and implement digital technologies that support the health and wellbeing of the planet and all its living creatures (including humans) so that all can flourish?; and (iv) How can digital technologies affect ecological systems, for better or for worse? Developing digital One Health expands both the digital health field and the One Health perspective, leading them into crucial new directions for mutual flourishing.

Keywords

Digital health, One Health, more-than-human health, planetary health, digital media, climate crisis

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Introduction

Most definitions and interpretations of 'digital health' are entirely human-centred. They focus on how digital devices and software can be used to generate and share health and medical information and experiences, help people engage in self-care and monitor their bodily functions and activities, provide remote healthcare, conduct human disease surveillance and public health interventions, and assist healthcare practitioners with medical diagnosis, treatment and education.[1] A search of this journal's content, for example, surfaces very little material that discusses health issues beyond those experienced by humans, perpetuating an anthropocentric focus. Yet it is increasingly evident that simultaneously, the nonhuman dimensions of the environments that people inhabit are becoming increasingly digitised and datafied through the use of sensors and monitoring technologies. These include technologies such as digitised tagging systems, video streaming services and surveillance drones used to monitor the health and growth of livestock, wild animals and pets. Digital sensors are used to monitor aspects of wilderness areas, oceans and waterways, agricultural land and the built environment such as soil moisture levels, pollution levels, geological movement, temperature, energy use and transport systems.[2,3]

On the part of digital health researchers, the risks and harms to humans of ill-considered attempts to introduce digital health technologies into healthcare, such as exacerbating inequalities, lack of digital access, or personal

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health data breaches, have been extensively discussed.[4,5] However, commentators on digital health are only just beginning to recognise and acknowledge the potential effects on other animals, the climate and the environment of the energy expenditure, ecological devastation, carbon emissions and digital waste that are part of manufacturing, distributing, using and disposing of digital health technologies and storing digital health data.[6]

The One Health approach in medicine and public health, initiated by veterinary scientists, brings together those interested in human health with those focused on animal health. With a particular focus on the spread of zoonotic infectious disease and the problem of anti-microbial resistance, this approach considers the health status of humans to be closely linked to that of other animals and microorganisms.[7,8] One Health has therefore been characterised as a paradigm shift.[8–10] Yet it has also been criticised for not paying enough attention to other planetary health issues, such as climate change and the destruction of the environment, and for insufficient critical recognition of sociocultural and economic factors.[7,8,11] Furthermore, thus far, contributors to the One Health literature have devoted surprisingly little attention to the role of digital technologies in planetary health. When they do so, it is usually in relation to using devices and software to monitor pathogens and disease in non-human animals or plants,[12] or how health information is communicated using digital media.[13]

A proposition for an affirmative digital One Health

What if we start to expand out the human-centred approach to digital health – by changing the title to 'digital One Health'? How can the One Health perspective in turn begin to acknowledge the role of digital technologies? What would this mean for how we think in a more inclusive way about human health, the health of other living creatures and the environment that sees all these elements as part of a whole?

Philosophically, my approach to digital One Health draws on Rosi Braidotti's affirmative ethics approach, which adopts a more-than-human perspective. Such a perspective highlights the relationality of all things, human and nonhuman, and considers how people can become more sensitised to their connections with other creatures and the environment so that mutual flourishing can occur: or what Braidotti refers to as 'generative life'.[14] To best achieve a more expansive and affirmative approach to One Health, identifying ways to enhance planetary health that go beyond the identification and management of risk is required.[7] It is here that the sociocultural dimensions of people's understandings and everyday practices and their relationships with nonhuman beings, objects, place and space need to be brought to the surface. This approach aligns with what has been dubbed a 'Radical One Health Approach'[8] as well as incorporating a critical digital health perspective.[5]

Applying concepts and terms from the natural world to new digital technologies is a longstanding practice. We already routinely draw on organic and ecological metaphors and images: the World Wide 'Web', computer 'viruses', 'cloud' computing, the 'rivers' or 'tsunamis' of big data, artificial 'intelligence', 'neural' networks, digital 'twins' … to name merely a few.[15] Such biophilic language conveys the deeply affective and meaningful relationships humans have with nature.[16] I suggest an approach to conceptualising the scope and focus of digital One Health that is underpinned by the acknowledgement that humans use digital health technologies and data in more-than-human and more-than-digital worlds.[17–19] Such an expansive approach brings together more-than-human theory with such diverse fields as the environmental humanities, new media studies, science and technology studies, digital sociology, digital anthropology and critical animal studies. It benefits from and builds on the increasing attention and value that have been given to non-western relational philosophies acknowledging the importance of nonhuman agents in human health and wellbeing, and vice versa.[20–22]

A set of key questions can take the idea of digital One Health forward. These include the following:

(i) How can we learn more about and establish deeper connections with other animals and the natural environment through digital media, devices and data?
(ii) How can we attune humans to these more-than-human worlds using digital technologies, cultivating attentiveness and responsiveness?
(iii) How can we better develop and implement digital technologies that support the health and wellbeing of the planet and all its living creatures (including humans) so that all can flourish?
(iv) How can digital technologies affect ecological systems, for better or for worse (e.g. energy expenditure and electronic waste vs conservation/sustainable technologies)?

Promising initiatives

Contributors to the growing literature on animal–computer interaction studies and new media studies have begun to show how digital technologies can be used to better become attuned to and care for nonhuman animals[23,24] and engage in activism against animal cruelty and factory farming.[25,26] Design fiction approaches have been used in human–computer interaction studies to help people imagine the future of automation in the context of climate change.[27] Digital storytelling has been used as a way of providing a voice to Indigenous people to articulate their ethos of connection, including their relationship with place and the living and non-living occupants who cohabit with

humans.[28] Citizen science initiatives using digital sensors and other digitised data collection techniques have contributed to the amassing of databases about phenomena such as the environmental effects of pollution, localised climate change impacts, loss of species diversity and efforts to regenerate cleared land.[19]

Museums, science and art galleries and exhibitions around the world have begun to experiment with using digital technologies together with more-than-human ways of seeing, doing, thinking and feeling. They have recognised that processes of digitisation and datafication can contribute to awakening humans' awareness of the delicate balance of living creatures in local and global ecosystems. Some promising initiatives are already beginning to emerge that lead us in this direction. The 'Feral Atlas: The More-than-Human Anthropocene' digital project published by Stanford University Press is one such example.[29] This multidisciplinary collaboration brings together anthropologists, artists, creative writers and scientists. The website defines 'feral ecologies' as 'ecologies that have been encouraged by human-built infrastructures, but which have developed and spread beyond human control'. It offers a playful interactive experience for visitors, focused on surfacing the complexities of the entanglements of humans with nonhuman species, place and space. On the website, 79 field reports, featuring plants, fungi, animals, diseases and pathogens as well as objects such as plastic bags, trash, induced earthquakes, antibiotics and toxic fog, can be explored.

Other examples of digital initiatives include attempts to raise publics' awareness of anthropogenic environmental destruction, species loss, emerging diseases and climate change by bringing together public art with digital technologies.[30] For example, artist and academic Leah Barclay creates augmented and virtual reality immersive environments that layer soundscapes, sonic art and narratives with place and space. These environments include soundscapes of creatures living in aquatic ecosystems across the planet, as well as forests and bushland. For example, her CANOPY project brings the wildlife sounds of the Amazon Rainforest to urban environments around the globe. Listeners use their mobile devices to trigger geolocated soundscapes as they walk through iconic locations. At COP21 United Nations Conference on Climate Change in Paris, this project was deployed to transform the Eiffel Tower into a sonic rainforest.[31]

This body of research and creative initiatives offer some inspiring, capacious and creative ways forward for non-anthropocentric digital health research, theory and technological development. Extending the One Health approach, these perspectives can work towards an affirmative ethical position that acknowledges the relational connections between all things on the planet: from the microbiota living in and people's bodies to the mountains, oceans and stars. When art and science are combined in multisensory digitised environments, participants' minds, senses and bodies can be opened to the potentials of seeing and living with nonhumans as kin. In this age of ecological/pandemic crisis, digital One Health is an exciting and optimistic path forward for the protection and flourishing of planetary health and wellbeing.

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