



Recommendations for the role of social science research in One Health



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ABSTRACT

The social environment has changed rapidly as technology has facilitated communication among individuals and groups in ways not imagined 20 years ago. Communication technology increasingly plays a role in decision-making about health and environmental behaviors and is being leveraged to influence that process. But at its root is the fundamental need to understand human cognition, communication, and behavior. The concept of 'One Health' has emerged as a framework for interdisciplinary work that cuts across human, animal, and ecosystem health in recognition of their interdependence and the value of an integrated perspective. Yet, the science of communication, information studies, social psychology, and other social sciences have remained marginalized in this emergence. Based on an interdisciplinary collaboration, this paper reports on a nascent conceptual framework for the role of social science in 'One Health' issues and identifies a series of recommendations for research directions that bear additional scrutiny and development.

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1. Introduction

Evolution in communication technologies has made the possibilities for information-exchange, networking, and data integration limitless. Using new and emerging communication technologies to promote health behavior change and facilitate decision making is fast becoming the norm among health practitioners. Grassroots communication efforts have stimulated technological innovations that are facilitating social change (e.g., Crisis Commons and Ushahidi), capturing epidemiological trends (e.g., Google Flu; [Bernardo et al., 2013](#)), driving the development of the so-called 'quantified self' (c.f., [Topol, 2012](#)) and transforming the nature of human and animal health systems (e.g., Patients Like Me, I-Cow). In the science of communication and information, however, there remain many unanswered questions about how and whether new communication technologies can be useful for influencing outcomes such as facilitated decision-making, innovation diffusion, and behavioral adaptation. Researchers are examining the characteristics of the users of new communication media to inform health communication practice (e.g., [Chou et al., 2009](#)) and are striving to determine

the ways in which the nature of the content and sources of information work with the features of the technology to drive behavior change and adoption patterns. At the root of all communication technologies, however, is human action and interaction. Our understanding of how and why humans make decisions and take action is fundamental to questions of the ways in which communication technologies function in societies.

The current paper has been inspired by the work of [Hesse et al. \(2010\)](#) in their article *Social Participation in Health 2.0* and [Topol's \(2013\)](#) *The Creative Destruction of Medicine*, which set the stage for research on the role of communication technologies in the human health domain. Our focus is the integration of human, animal, and ecosystem health as a context for thinking about innovative research on communication technology and human behavior from a range of perspectives. Given the fast pace of change in technological innovation and research, as well as the complex nature of One Health issues, addressing these questions demands the attention of integrated teams of scholars in diverse fields to determine where research efforts should be focused. The concept of One Health provides a context for formulating a research agenda because it is inclusive across a broad range of disciplines as well as timely; for example, United States Centers for Disease Control and Prevention (CDCP), World Health Organization, World Bank, Food and Agricultural Organization of the United Nations (FAO), World Organization for Animal Health (OIE) and others have begun to

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shape policy and practice in this area (CDCP, 2013; World Bank, 2010, 2012).

At its simplest form, One Health is the idea that human, animal, and ecosystem health are interdependent. Although the concept of One Health is not novel, there is a pressing need for renewed focus on interdisciplinary efforts in this arena in order to improve health. Despite the recognition that human communication processes and behaviors are critical in this realm, social scientists have not played a central role in the One Health conversation (Choffnes et al., 2012). Recommendations from previous One Health meetings, held by the CDC (Centers for Disease Control and Prevention, 2013), National Academies of Sciences (Choffnes et al., 2012), and others (see, Hueston et al., 2013), recognized that communication, in particular using new technologies and the knowledge base about human behavior change and decision-making, is critical to achieving 'One Health' goals. Yet, there is a paucity of research regarding efficacious approaches. Further, in order for One Health approaches to be adopted, it must be clear that there are added benefits to pursuing an intervention integrated across human animal and ecosystem health. Adoption of One Health approaches will not (and should not) be adopted without a clear sign of added value (Zinsstag et al., 2012a). As such, this paper reports on a nascent effort to craft several broad directions for social science research in the One Health realm.

2. Communication technology, human behavior, and the value of social science

Communication technology continues to change the nature of human interaction in key ways; yet fundamentally, human behavior is at the root of all technology questions. As such, social science, in all its forms, contributes to understanding how technologies form and function in society. We recognize the breadth and tremendous diversity of disciplines and perspectives encompassed by the term *social science* and do not claim to represent its breadth here. We use this term simply to mean researchers who study humans. With this said, understanding how communication technology changes human experience (and the experience of other animals and ecologies) drives much of our thinking. Recognizing the concept of the 'digital divide,' our premise is that the ideas presented here regarding communication technologies (existing and emergent) and human behavior are globally focused; revolutions in the ways in which communication technologies are leveraged are occurring all over the world. There are several aspects of communication technologies that we highlight here as an overarching framing for the paper: the concept of constant connection, enabling access to large-scale information and human connections, and the potential for contextualized decision-making and behavior.

Many people across the globe now have the ability to be constantly connected: across time, space, and place (Vorderer and Kohring, 2013), and this ability serves as a disrupting and facilitating force in people's lives (Misra and Stokols, 2012). This means that there is potential for almost limitless access to information about everything from market prices of goods being sold in a faraway city (e.g. Abraham, 2006; Fafchamps and Minten, 2012) to pandemic disease outbreak maps; from what one's mother (who lives 1000 miles away) thinks about what you ate for dinner last night to how many steps you walked yesterday. One can connect with another person at any time and almost any place. This information and connectivity cuts across contexts; it can influence the way people live their lives including the breadth and depth of interpersonal connections with others (Ellison et al., 2011) and the nature of people–environment relations (Misra and Stokols, 2012).

Along with facilitating interpersonal communication among single individuals, emerging communication technologies have enabled communication among groups of people; revolutionizing how people engage in decision-making, team work, and collaboration. This has the potential to change the ways in which individuals, groups, communities, and societies function. Forte and Lampe (2013), for example, have discussed the concept of open collaboration and technology-enabled innovation spaces (e.g., Wikipedia, the most widely known) enabling things such as disaster response, open mapping, aggregation of news and information, and crowd-sourcing of democratic processes. It also has the potential to change the ways in which we think about others as influential in our lives; making the study of group dynamics and group processes more important and more complicated than ever.

The potential for ubiquitous connection to individuals and groups, along with the access to large-scale and innovative forms of information (about the self as well as about other entities) allows for contextualized decision-making in a form never seen in the history of human-kind. That is, for any one decision, a person or group may access massive amounts of information ranging from system-level factors to individual opinions. This elevates the need to understand issues such as critical evaluation of information and information processing, the role of group norms and networks, and information/data visualization, integration, and management; points we will return to below. Social scientists, both those who's focus has been in information science and those who have not, contribute to our understanding of these issues through their research on decision-making and communication related to health and the environment, the ways in which innovations disrupt the social environment and promote change (Misra and Stokols, 2012), and how interventions like those seen in the realm of health behavior can influence behavioral decisions and ultimately human, animal, and ecological health outcomes. Communication technology and the information and connections it affords increasingly plays a role in decision-making about health and environmental behaviors and is being leveraged to influence that process.

Working under the assumption that a diversity of viewpoints can facilitate solving the challenges faced by the application of technology to questions of decision-making and behavior change in the context of One Health, this paper brings together the perspectives of a broad cadre of social science researchers with scientists in human, animal, and ecosystem health to determine key research questions for using new and emerging communication technologies for understanding and facilitating behaviors that might impact One Health challenges. With support from the National Institutes of Health, this group (Appendix; Link to Figure) has convened in a series of meetings at Michigan State University over the last two years to begin to form collaborative teams and forge a research agenda in this space. For this paper, our goal is modest; to identify several broad issues that can generate additional thinking about the role of social science in One Health questions. As such, we focus the scope of this inquiry to places we see as value-added by the possibility of social scientific research to answer broad questions in order to move science and practice forward. Ultimately, our agenda is more ambitious: to craft an integrated framework for interdisciplinary research that allows for testing of basic research questions in various social, biological and physical science disciplines; gaining insight into practical application of the research findings, and true integration of research projects across traditional disciplinary boundaries. Ideally, it is hoped that integrated research projects that are of substantive interest for researchers in the biological, physical and social sciences can be developed as a result of these efforts and produce real impact on One Health-related challenges.

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