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EDITED BY
Cristina Possas,
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REVIEWED BY
Gilbert Fokou,
Swiss Centre for Scientific Research,
Côte d'Ivoire

*CORRESPONDENCE
Catherine Grant
c.grant@ids.ac.uk

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Operationalising transdisciplinary remote methods in epidemic and pandemic preparedness and response in Sub-Saharan Africa

Catherine Grant*

Institute of Development Studies, University of Sussex, Falmer, United Kingdom

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Introduction

Pandemics and epidemics are a form of crisis and crisis alters what society thought to be true and the previously taken for granted status quo, normal practice is suspended and a new set of actors, institutions, activities and discourses come into play (1–5). This is an opportunity and a challenge for social science researchers to be innovative in the methods they use during outbreaks, paying particular attention to how to adapt research to make it operational in these circumstances. A large part of this work often needs to be done remotely due to the nature of pandemic restrictions on human interactions such as lockdowns (6). Part of the process of method design is understanding that pandemics involve a complex interplay of biological, social, economic, and cultural factors (7). No single discipline can fully capture the intricacies of a pandemic and there is a need for transdisciplinarity, a 'multi-actor, community co-production that brings knowledges and values, of disciplines and non-academics, together in the pursuit of common or shared goals' (8). This can ensure methods go beyond interdisciplinarity to include communities and local knowledge (8, 9). A transdisciplinary approach moves beyond the limits of disciplines and generates new ways of organising knowledge and methods of thinking. It is also problem-based and concentrated on practical applications of knowledge in the real world where issues tend to be multifaceted and call for multiple analytical perspectives (10–12).

The contribution of social science

Anthropology and social science can make a big contribution to the process of operationalising transdisciplinary remote methods due to their understandings of how knowledge and power is altered in a crisis context. Part of the work of the discipline is analysing power relations and whose knowledge is utilised during a crisis. Anthropologists also create enduring relationships with communities that could be useful once a crisis hits, whereas most disciplines do not have this opportunity (8). Ethnography gathers local

wisdom, and using a transdisciplinary approach could enable this to brought into policy discussions and operationalised to improve preparedness and response. Taking time to develop these methods can help to prepare for 'Disease X' (an unknown pathogen that could cause a serious international epidemic) and other future outbreaks when they appear, as having these methods ready will enable fast response (13).

Crises

This commentary outlines how remote transdisciplinary methods are evolving at the local and global level and gives examples of remote methods that have been used to overcome obstacles put in place during a crisis, with a particular focus on Africa. These include modelling, social media analysis, community engagement and collating existing knowledge through rapid response helpdesks (6, 9, 13). This research was conducted during a turbulent period, from 2013 through the 2014-16 Ebola outbreak, the declaration of Disease X and concluding at end of the Covid-19 outbreak.

Pandemics are seen as crises under the United Nations definition of humanitarian crisis as 'an event or series of events that represents a critical threat to the health, safety, security, or well-being of a community' (14). However, crisis is a far more nuanced process and there is political decision making around when something is seen as a crisis. For example, some zoonoses outbreaks, especially pre-2014 have been seen as a crisis in the place they are happening, but been largely ignored by the global community. The 2014-16 West Africa Ebola outbreak changed this as the threat to the Global North was recognised (15). Then, COVID-19 was seen as a global crisis, but in some communities in Africa it was simply known as a 'disease of the radio', which was not affecting them (16, 17). Social science can help to understand the powerful politics playing out and ensure methods are designed to suit each crisis.

Change spurred on by crisis calls for examination and rearranging of how we see and understand the world. This can be an opportunity for disruption, innovation, and creativity. Methods, positionality, theoretical groundings, and data collection are altered and innovative approaches are needed (1–3). Whilst most aspects of crisis are negative and challenging for researchers and policy makers, there is potential for new ways of conceptualising societal challenges and disrupting the status quo. However, ensuring that this disruption leads to improved outcomes requires adapting research to make it operational in these circumstances.

During pandemics it can be difficult to continue with traditional research methods, as movement restrictions stop social interactions, altering normal behaviour patterns and the ability to conduct research with people. Additionally, power relations change as does whose knowledge is used in policy making and why. Remote social science methods can play an important role in gathering data and understanding the different contexts and narratives. These have evolved significantly over the last decade, driven largely by advancements in technology and increasing recognition of community engagement in pandemic preparedness (6, 9). There are challenges to conducting effective remote research on Africa using technology including varying access to social media and the Internet, ensuring representative sampling, linguistic diversity, and the need for nuanced understanding of local cultural contexts (18).

Policymakers acting within a crisis make fast decisions based on the information available. Therefore, research which is relevant, accurate and operationalisable is key. Anthropological and social science (and past knowledge gathered from these disciplines) becomes increasingly important to explore the complexities of the relationships between power and knowledge, different perspectives and the unexpected outcomes these may generate.

Modelling

Models are useful in preparation for and during outbreaks as they provide predictions to advance knowledge, and evidence to inform policy (9, 19–22). However, models also reproduce and are constructed based on disciplinary boundaries (23). Different models highlight different issues and are based on different assumptions, world views and sources of information, leading to different conclusions about disease risk and the appropriate actions and policy decisions to take. Transdisciplinary modelling can use participatory research and community knowledge in conjunction with traditional modelling methods to potentially improve disease management. It embraces multiple sources of evidence, including anthropological information which is already known, when research cannot be done in a traditional way during crises. Whilst models often decontextualise knowledge and therefore can provide responses that do not fit with the local sociocultural reality, trandisciplinary modelling aims to add knowledge based on specific local contexts and stakeholders.

Grant et al. provide detailed information on this approach, and one example is that participatory research can help to remove irrelevant information from models such as human movements to market when no vectors of disease have ever been encountered going to market (9). Prior participatory research can also highlight neglected information. For example, a theoretical model for Rift Valley fever included the temporal dynamics of water bodies, which initially was assumed to be driven solely by the environment (seasonal rainfall and evaporation), while anthropogenic activities were not considered relevant. However, participatory research revealed that these patterns can also be driven and altered by irrigation during the dry season, thus making the model more accurate (9).

Technology and social media

Technology and social media were used on a vast scale to keep people informed, productive, and connected during the COVID-19 pandemic and can provide understanding of public sentiment and behaviour. Whilst it was widespread during previous outbreaks, for example, Ebola and Zika, the lack of human contact during the COVID-19 lockdowns made it an even more important source of social connection, and it is especially important for research when it

is impossible to use traditional methods (24–26). As a transdisciplinary method it allows for nuanced understandings of social and behavioural issues and integrating insights from various disciplines enhances the effectiveness of interventions.

Social media data can also be used to complement traditional epidemiological surveillance by providing quick and efficient real-time insights into public concerns (6, 13, 27). It can contribute to the development of early warning systems by identifying regional disease trends, anomalies and emerging symptoms. Geotagging also allows for spatial analysis to identify hotspots of discussion or areas where there are specific challenges. This can help anticipate and respond to emerging issues and allocate resources to vulnerable populations.

It can also be used for context specific risk communication and public engagement to understand how information is disseminated and received, identifying sources of anxiety or misinformation and when people are not coping as a result of disease mitigation strategies such as lockdown (27–29). This information is crucial for authorities to counter false narratives and address concerns promptly and can inform behavioural interventions and public health campaigns. Social scientists can contribute to the interpretation of these behavioural insights and this can assist policymakers about public concerns and help maintain public trust.

One example of this type of research is using social listening to examine narratives around the lockdowns in Africa to investigate how people balanced concerns about preventing the spread of COVID-19 with other priorities (6). In Africa the threat of the pandemic was less than in other parts of the world, and the consequences of lockdowns for people's lives and livelihoods were greater. Pandemic preparedness and response are not neutral, technical endeavours, but are subject to inherent imbalances of power in policy contexts in terms of which voices and narratives are heard in policy-making. The range of narratives is reflective of the blindness to inequality and social difference of much decision-making by policymakers.

Community engagement at the local level

There has been a growing recognition of the importance of involving communities in pandemic preparedness efforts. Remote social science methods have enabled researchers and practitioners to engage with communities more effectively, even in remote areas, and to incorporate local knowledge and perspectives into pandemic preparedness strategies. Trust and long term relationships need to be established for remote methods to work during an outbreak, therefore anthropologists are well placed to carry out these methods as the groundwork has been done to establish this prior to the crisis. Mobile technology, such as text and mobile applications, have also been increasingly used for data collection and communication with communities. This has improved access to and participation in research and interventions.

Additionally, interviews, workshops and other social science research can be done remotely to understand the narratives around policy which exist in different communities and social science research can be operationalised and integrated into other disciplines (30–32). This can allow understanding of viewpoints of different actors on how to respond, for example a study on Trypanosomiasis showed that diverse framings are held by key actors looking from, variously, the perspectives of wildlife and environmental protection, agricultural development, poverty alleviation, and veterinary and public health. Within these narratives there are also conflicting views on the best control methods to use and different reasoning behind the pathways of response. These are based on apparently incompatible priorities of people, land, animals, the economy and the environment and unpicking and understanding this can ensure a transdisciplinary policy response considering all perspectives can be realised (31).

Collating existing knowledge at the moment of crisis

Producing rapid operationalisable research which can be done remotely and is available at the moment of crisis or in time for key policy decisions to be made has been successfully used during epidemics. There have been several rapid response social science helpdesks utilised during epidemics and pandemics[1] (33–36). This is important for transdisciplinarity as it focuses on practical real world issues.

Rapid response helpdesks can provide timely advice, for example the Ebola Response Anthropology Platform and the Social Science in Humanitarian Action Platform included anthropologists providing advice on how to engage with crucial socio-cultural and political dimensions and build locally-appropriate interventions. There are many examples of these being used by policymakers at the then Department for International Development, the British Army and practitioners, for example UNICEF; "*on the ground I'm one of the ones who appreciates it the most … They have supported all kinds of discussions in an open and sharing way … I don't know that I've ever felt so supported in a response by people I've never met before*!" and from the CDC; "*They provide the mechanism to coordinate [and] generate social science evidence that can feed rapidly into responses to disease outbreaks such as Ebola*" (37). HEART, HDRC and K4D were other similar helpdesks providing policy advice. Abramowitz recognised their usefulness; '*early collaborative anthropological documents … used anthropological knowledge about local funerary beliefs and health practices to critique the global failure to seek behaviour change as a primary response strategy. Such reports challenge conventional wisdom by arguing that international experts' misconceptions about West Africans' responses to the epidemic were an important factor impeding the effectiveness of the response*' (38).

1 DFID Human Development Resource Centre (HDRC) ,DFID High-Quality Technical Assistance for Results (HEART), FCDO K4D, the Ebola Response Anthropology Platform, Social Science and Humanitarian Action Platform, the Covid Collective and the People's Agenda for Pandemic Preparedness).

Anthropologists advised that preventive behaviour change would be supported if they were seen as reasonable and implementable by communities, particularly if they involved minimal threats to livelihoods and culture but during a crisis sometimes even radical cultural change is needed. An example of this adaptation was short-term changes to local burial practices during the 2014-16 West Africa Ebola outbreak (38–40).

Conclusion

Remote social science methods have facilitated greater collaboration between different disciplines and transdisciplinary approaches can generate more comprehensive and effective pandemic preparedness strategies. To operationalise the use of remote transdisciplinary methods for pandemic preparedness in Africa, there needs to be a wider understanding of the benefits of these approaches and an understanding that pandemics are not just biomedical issues, but social ones as well (7, 41). Building partnerships with local communities and stakeholders is key so that when crises emerge existing relationships can be utilised to allow remote methods to be more successful and anthropology and social science are uniquely placed to facilitate this.

Author contributions

CG: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

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Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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