**Social science approaches to infodemiology: understanding the social, political, and economic context of information**

Abstract

Embedded within the COVID-19 pandemic is the spread of a new pandemic of information – some accurate, some not – that can challenge the public health response. This has been termed an ‘infodemic’ and infodemic management is now a major feature of the World Health Organization’s work on health emergencies. This commentary highlights political, social, and economic aspects of infodemics and posits social science as critical to mitigating the current infodemic and preventing future ones. Infodemic managers should address the wider context of infodemics if we are to understand narratives, help to craft positive ones, and confront the root causes of misinformation rather than just the symptoms.

INTRODUCTION

Social scientists have long examined the political, social, and cultural contexts in which information circulates (1). During a disease outbreak, particularly of a new disease such as COVID-19, individuals will seek to understand the threat through diverse interpersonal and official communications and types of media (2). Information should be reliable, factually correct and appropriate for the context. High-quality information can spread faster than disease, encouraging early adoption of protective behaviours and building trust in reliable sources, as long as it answers people’s questions and concerns (3,4). As the pandemic continues, an embedded pandemic of information – some accurate, some not – related to COVID-19 has spread but amongst this vast flow of information, not all information is equal, not all is equally accurate (5). Misinformation (12,13) – low-quality information spread in ignorance – and disinformation, which is deliberately misleading (6) may have different intent behind them but their content and impact may be the same. Furthermore, in spite of the volume, there are still often information gaps that are vulnerable to rumour and mal-actors (7). Data voids (lack of information that is needed or expected (7), creates information voids that rumour, speculation, mis- and disinformation can fill, posing a challenge to public health responses. Proactive prevention of rumours and misinformation that can emerge due to information voids is therefore at least as important as reactive removal or rebuttal.

During the COVID-19 pandemic, a number of challenging explanations of the disease have emerged, some with a basis in misunderstandings (e.g. that vaccines could affect women’s fertility) (8), driven by reports that vaccination might temporarily disruption the menstrual cycle (8,9) others are incredible theories, including that 5G wireless technology caused and spread COVID-19 (10) or that the disease was intentionally released by global elites (11).

Sometimes these theories develop to fill a vacuum when something has gone wrong with public communications, but sometimes they are based on valid grievances (12): people communicate low(er)-quality information for a variety of reasons, not all of them nefarious. They may find such information amusing, or mistakenly believe it to be true. They may consider it bizarre, curious or surprising. They may make a guess when information is sparse that later turns out to be wrong, or because nothing else is available and they are left with the best on offer (11). Often, inadvertently, it becomes a problem when that information is amplified or is circulated further by those who do have nefarious motives (13) or by algorithms that programmed to maximise profit regardless of accuracy. Crucially, social science can help to understand *why* information has spread, as well as *how.*

“Infodemic managements” has become an increasing focus of the World Health Organization’s work on building preparedness for health emergencies (14). Infodemiology is the study of *infodemics,* while infodemic management is the practice of managing them. We contend that to truly manage infodemics, social science must be an integrated pillar of this effort, bringing understanding of the subtleties of communicative ecology and information ecosystems. The role of social science in infodemiology is more than just risk communication and community engagement (RCCE) and can be wider than Integrated Outbreak Analytics (22). Social science methodologies and conceptual framings can be applied to ‘bigger’ digital and online data in a variety of ways, for example by using actor network theory (15) to help understand the role of algorithms in pushing social media content, or by deepening the understanding of digital intimacy (16) in community dynamics.

WHAT WE’VE LEARNED FROM PAST CRISES

In order to manage infodemics, it is important to understand the context of information. Social science research has documented the context of misinformation during epidemics (1). While misinformation is everywhere, not everyone finds it credible. One common explanation is that some find misinformation plausible because of cognitive biases like confirmation bias (17). However, we all find meaningful patterns in the world around us and make causal inferences based on them. Historical and political experiences of neglect, discrimination, or abuse provide fertile ground for misinformation to gain traction and become ‘plausible’ (18). During the 2014-16 West Africa Ebola epidemic, communication and social mobilization strategies often failed because of their focus on changing ‘risky behaviour’ related to ‘misinformation’ (19). As Chandler and colleagues pointed out, these strategies did not take history and context into account (19). Vaccination is another useful case in point, as vaccine misinformation often proliferates from the very outset of vaccination programmes, built on legacies of structural violence and discrimination (8). Recently in Northern Nigeria, Muslim leaders interpreted polio vaccination as a way of sterilising Muslims and linked this to experiences of repression by the central government (20). In Nigeria, there had been both political turmoil and some Nigerian families were suing Pfizer at the time for unethical treatment during vaccine trials (20). While public health practitioners may not agree with the misinformation, it is important to take communities’ concerns seriously and demonstrate good faith efforts to do so. Ultimately all efforts should aim to improve trust between public health response and communities.

INFODEMIC MANAGEMENT AND COVID-19

Previous studies have documented the proliferation of information in disease outbreaks, including social media content, academic papers, case trackers and data to inform public health action. The use and range of social media to keep people informed, to exchange information and experiences, and maintain connections continues to expand (21). The technology that enables these connections and sharing of information is also facilitating the amplification of misinformation. This is exacerbated when world leaders make specific claims about COVID-19, including former US President Trump’s comment on the injection of bleach to prevent COVID-19 (22) or Tanzanian President Magufuli’s warning against the use of COVID-19 vaccines (23). These claims can be laden with political strategy, as is the case in Brazil where misinformation has been used by President Bolsonaro as a ‘political weapon.’ His office coordinates the spread of disinformation, both on COVID-19 and to defame public health experts, scientists, and opposition leaders (24). The use of social science approaches to understanding and mitigating epidemics can lay bare the political-economic context of the information ecosystem and may enable us to tackle root causes rather than the misinformation itself.

WHAT WE RECOMMEND FOR INFODEMIC MANAGEMENT

While mitigating or resolving longstanding issues related to neglect, discrimination, or abuse may take a long time, there are short-term actions that can help to build trust and address the context in which misinformation and information voids can more easily arise.

These actions can inform the practice of infodemic management by integrating social science research findings or working directly with social scientists in-country (25).

1. Use social science and social scientists to understand the socio-economic, political and historical context in which information is circulating, the specific communicative ecologies in which individuals communicate (26) and the format, timing and context of both the medium and the message. Local contexts and cultural framings can shape meanings and influence how information is received, interpreted and shared, and determine which voices are most trusted. Recognising this context will help to identify key influencers and platforms, common ground, potential allies and main challenges who can aid the public health response. This should be part of a multi-disciplinary effort in which evidence from different sources is compiled and analysed together (including from the health system, epidemiologists, communities, the economy etc.). It should involve engagement from the people who will also use those data across *all* pillars of emergency response (22).
2. Adapt communications, health system response and service delivery to respond to the concerns of different groups of people, using trusted sources and platforms in a timely and consistent manner (27). While many affected communities face common challenges, they each also have unique needs. It is important to adapt messages to reflect the diversity of audiences – offline and online. Use language, rationales and justifications that appeal directly to target groups. Consider how different meanings could be attributed to particular phrases or images and what feelings these might evoke. Test all communications outputs (videos, posters, messages) with intended audiences – keeping evaluation and implementation at the centre of thinking. Focus on understanding the role of local news media, advertising platforms, artistic representations and community platforms as well as online media.
3. Establish dialogue and create feedback systems. At a basic level, people need to be able to express their views, opinions and concerns and freely ask questions that will be answered by people they trust (28). Appropriate suggestions should be incorporated into response and future plans to ensure people feel included and heard. It is critical to ensure engagement is ongoing to track and understand shifts in people’s perceptions as events unfold, and to identify barriers and enablers of positive health behaviours. Behavioural change is more likely to be successful and sustainable if the community has full ownership in developing solutions from the earliest stages (29).
4. Include diverse groups and listen with an open mind. Engagement should be empathetic rather than judgemental or patronising. Infodemic management needs to engage with multiple stakeholders, including media agencies and platforms through which messages will be disseminated, particularly where these may be pushed by artificial intelligence. Consultations should include representatives of vulnerable and marginalised groups who understand the practical challenges faced by their communities, and the origins of concerns and barriers (30). Place them at the centre of efforts to engage communities and build relationships based on pre-established trust.
5. Be transparent, consistent and open, particularly about uncertainty, controversy and mistakes (31). Be honest about what is being done in response to the epidemic. Be open about what is known and unknown and where there is uncertainty; prepare audiences for the likelihood that advice may change. Be clear about how decisions have been made and transparent about who played a role in decision-making (e.g., pharmaceutical companies, private outsourcing, the role of decentralised authorities, representatives of minorities, etc.). If new information suggests that mistakes have been made, be honest about this and explain what is being done to address them.
6. Offer compelling narratives that build a sense of capability and motivation to act. Develop engagement strategies that explain the truth clearly rather than only dismissing misinformation and debunking myths. The same information reaches different audiences: understand who these audiences are and what their distinct, and potentially competing concerns may be. Recognise where concerns originate and identify what messages are more likely to generate positive emotional response and a sense of togetherness and solidarity. Social scientists can support infodemic management to engage local communities, build trust and co-create solutions and messages that are more likely to lead to effective responses.

CONCLUSION

COVID-19 will not be the last pandemic. We can work to understand the networks of information and how and why people communicate the way they do. We can also work to make public health responses like infodemic management more contextually adapted. These should involve building in assessment of evolving communicative ecologies as a basis for understanding the relationships between social interactions and the technology and media environment in which narrative themes develop. Social science perspectives and approaches – from its more traditional methods of data collection and analysis approaches (e.g., ethnography, interviews), to those which can offer new perspectives on the ‘big’ data element of infodemiology (e.g. digital geography and actor network theory) can support greater understanding and unpacking of these evolving communicative ecologies. Ultimately, addressing root causes of misinformation and information voids can help ensure we will be better prepared to manage the next infodemic.

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