

Global health crises are also information crises: A call to action

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3.1 Our reflections on these challenges have led us to the following recommendations:

1. Misinformation/disinformation particularly during global health crises

In rapidly developing situations, misinformation due to inaccurate descriptions or interpretations of the situation and deliberately falsified disinformation are easily generated and spread quickly. As disinformation/misinformation has become a hot topic and is studied in a wide range of disciplines and fields, we urge information scientists to examine: (a) how information science might assist the use of trustworthy social media information while avoiding misinformation/disinformation, (b) systematic ways to automatically detect and stop the spread of misinformation/disinformation on mass media and social media, and (c) strategies to help authoritative organizations in using social media to communicate with individuals and intervene when health misinformation/disinformation spreads.

2. Health literacy—including eHealth literacy

Much research is needed to understand individuals' information behaviors in global health crises, including their abilities to discern good versus bad information from various information sources (traditional mass media, digital, interpersonal, etc.). Based on such an understanding, we can then develop interventions to improve individuals' health literacy, which must include eHealth literacy in today's world (Norman & Skinner,), that is, the ability to access, assess, and use digital health information to make informed decisions. This is important in global health crises where information flow via social media is especially overwhelming and rapidly evolving.

3. Information behavior during lock downs

In global health crises, an entire city (of over 10 million population) may be locked down for an extended time period. In such a situation, cellphones may become the most likely (and, in many cases, only) means to obtain essential information. Much research is needed to understand the abilities of individuals (including residents, local government officials, and community leaders) to use mobile applications (apps) to obtain information, app features that might be most needed, and the types of interface design most applicable in these situations. Furthermore, a user may use multiple mobile apps, platforms, and online groups simultaneously. Coordination and interoperability across online platforms will be critical.

4. Vulnerable populations—a case for accessible and usable solutions

In any crises, people who are most likely to suffer, and are in most need of help, are often those who are already in vulnerable positions. When much of the information and resources are disseminated digitally, individuals who are on the wrong side of the digital divide, for example, older adults, will continue to be ignored. Such a disadvantage may put older adults in double jeopardy: Older adults are more likely to be infected by the virus and have worse recovery; however, they are also vulnerable because they may not know how to obtain information about food and supplies online. Information scientists should work with government agencies, for-profit and nonprofit organizations, and community volunteers to reach vulnerable populations, including ensuring the accessibility and usability of (high-tech and low-tech) solutions.

5. Information dissemination, sharing, and integration among multiple forms of digital data

Information dissemination mechanisms and infrastructure should be established by information professionals and organizations (e.g., public libraries, national health organizations, professional associations) to deliver timely high-quality information during global health crises. In COVID-19, we have seen many cases where desperate clinicians (and patients alike) cry out via social media begging for protective supplies and other essentials (Buckley, Wee, & Qin,). Information science can contribute to the distribution of credible information between hospitals, clinicians, and patients and their families and connect their needs with volunteers and organizations who are willing and able to help. Social media plays an important role in crises, but typically, there are multiple social media platforms—for example, WhatsApp, WeChat, Facebook, and Twitter (Stephens et al.,). The interaction and interoperability among different social media platforms and their role in global health crises is worth studying. Any sensible modeling, interpretation, and prediction using social media data need to consider these factors holistically to yield better insights and improve decision making at all levels.

6. eHealth tools

Telemedicine has been used to consult, often in real-time via video, with a healthcare provider for individual-level clinical care. Recently, eHealth and mobile health (mHealth) have been adopted, including using a smartphone or tablet-based technology tools to facilitate individual- or population-level care (e.g., clinical decision support, sharing of information, and creation of dashboards or other population-level data sharing). In global health crises involving contagions, eHealth tools' major advantage is that they allow people to connect without personal contact. This makes it an ideal approach to help screen, track, and care for individuals who may not need to go to a hospital (where they might become infected by other patients) but still need care during the crisis. Information science can contribute to the design, implementation, and adoption of eHealth tools for use in global health crises.

7. Predictive methods

Emerging retrospective research suggests that results from mining social media data could have accurately predicted the H1N1 swine flu pandemic in 2009 up to 2 weeks before the U.S. Centers for Disease Control and Prevention (CDC) was able to confirm it (Signorini, Segre, & Polgreen,). Real-time tracking and mapping have been increasingly used (Yasinski,). Still, much work is needed: Research in social media mining should be further developed to predict the onset of a future global health crisis. It is also important to develop measures to avoid “false alarms.” In countries where social media activities are censored, special methods (e.g., machine learning algorithms, digital preservation, and archiving methods) may be needed to document and analyze the data.

8. Digital archiving

In global health crises, comparing the current crisis with previous ones with similar characteristics can yield valuable insights on the origin, development, and consequences. As such, timely, comprehensive, and accurate storage of digital information is critical. However, it appears that there is no specific website or official information system dedicated to storing information about Severe Acute Respiratory Syndrome (SARS), the closest comparison one might think of to COVID-19. Information science should lead the effort in archiving and storing digital information, especially social media information generated by the public, as an important part of our history—that may be of use in the prevention and management of future crises.

9. Ethical considerations

While we understand the need to disclose personal information in global health crises, we also urge information scientists to help protect the privacy of patients, suspected patients, and close contacts to the extent possible. It is useful to think about where to draw the line between transparency and privacy and how to integrate it into the design of information systems and interfaces. Information science should also contribute to the fight, globally, against negative stereotypes and hostile behaviors toward innocent people who may not even have anything to do with the spread of the virus (e.g., hostile behaviors against immigrant Chinese people as we have seen in COVID-19; D'Urbino, ; Iqbal,).