

The Impact of Social Media on Covid-19 Information Management System: A Review of Literature

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Abstract

The overwhelming volume of social media content on the novel coronavirus has threatened the global public health information system with millions of harmful texts, pictures, and audio and video clips. With this, social media appears a major source of infodemic around the COVID-19 pandemic. Given the importance of information management in disease prevention and control, the present study conducted a review of the existing literature to analyze the impact of social media on COVID-19 pandemic. The primary objective of this study is to explore the literature to understand factors that are responsible for the mass inclination to social media and how the infodemic it facilitated influences COVID-19 information management system. Thus, this study is poised to reconfigure the object of research agenda on social media and COVID-19 with the understanding that information communication technologies (ICT) and society are in a mutual-shaping relationship.

Keywords: COVID-19 pandemic, expert-knowledge, infodemic, social media

Introduction

Social media has the potential of conveying a sense of solidarity by connecting a large audience (Sterk, 2008). It provides an unequivocal opportunity for communication and social engagement in contemporary society. Various social media platforms such as Facebook, Twitter, Instagram, YouTube, Snapchat, and WhatsApp play a positive role in

disseminating information that promotes public safety during emergencies (Sterk, 2008; Medford, 2020; Richtel, 2020). Interestingly, numerous organizations, including the World Health Organization (WHO) and its Centre for Disease Control (CDC), national CDCs, national health agencies, and private individuals, use social media platforms in disseminating public health

information (Medford, 2020). Such information serves to educate the public on the nature of a disease, its symptoms and cures, and appropriate preventive measures to take (ibid). They can equally compel governments and pharmaceutical companies around the globe to be accountable and transparent in their invention, manufacturing, and distribution of palliatives and drugs, including vaccines.

It is, however, regrettable that these same social media platforms also provide unrestricted access to overwhelming amount of content that can amplify propaganda and questionable information (Cinelli, et al., 2020; Medford, 2020). This very role of social media appears to be a function of infodemic. As a concept developed by the World Health Organization to outline the perils of information management during a disease outbreak, infodemic denotes the spread of a huge amount of information about a disease that can equally obfuscate the solution to the problem (Medford, 2020; United Nations, 2020).

Evidence from the United States shows that infodemic exposes at least one-third of its population to misinformation and disinformation about COVID-19 through social media (Nielsen et al., 2020). Similarly, recent Twitter research on COVID-19-related infodemic found the sampled tweets to contain 25% of misinformation and 18% of unverifiable information (Kouzy et al., 2020). The inherent

danger, however, is that such content often propagates non-scientifically proven facts and figures about the COVID-19 pandemic, which potentially portrays the pandemic as a myth than a real disease (Aiyewumi and Okeke, 2020). And, as such, people tend to treat fake news as nothing but the truth (ibid). This highlights the importance of information management in disease prevention and control.

The importance of information management in disease prevention and control cannot be overemphasized because without accurate information little or nothing will be known about a disease like the contagious coronavirus disease. This appears the primary reason the World Health Organization identifies Information management as one of the most critical aspects of disease prevention and control. And by articulating this objective in the role of the Centre for Disease Control (CDC), it positions the centre as the custodian and sole provider of expert-knowledge on the nature of coronavirus and the most effective ways to mitigate the spread of the disease (WHO, 2020c).

With the scope of COVID-19 information covering the etiology (i.e. causes and origin) of the COVID-19, transmission patterns and symptoms, prophylactics (preventive measures) and cures, and situational updates on the effectiveness of interventions (WHO, 2020a). And some others that address organizational challenges like labour shortages, continuity and disaster recovery planning and

logistics, including monitoring supplies and delivery of personal protective equipment (PPE) (AEHIS Incident Response Committee, 2020). Regardless of the specific knowledge required, it remains the statutory role of the CDC to ensure that information provided is accurate and free from misinformation and disinformation.

In meeting this specific objective, however, the CDC provides both information about the COVID-19 with cautions against misinformation and disinformation. While misinformation is basically categorized as false information that is not necessarily targeted at individuals with the intent to mislead, disinformation entails the strategic and intentional dissemination of false or fake information (Jaiswal, 2020). Whatever shape they take, both equally expose people to either emotional, social or physical harm because they propagate non-scientifically proven facts and figures.

For example, misguided information on Covid-19 treatment published in a British tabloid, which prescribed consumption of methanol (a non-scientifically proven solution) as an alternative Covid-19 cure, caused hundreds of deaths in Iran (Forrest, 2020; Karimi, 2020). A similar experience of infodemic from 2014 Ebola outbreak (though, a relatively comparable emergency) in Nigeria caused two fatalities from the use of the salt solution, against a total of three recorded from Ebola disease (itself)

across the country (Griffin, 2014; WHO, 2014). Sadly, the trend in the latter of the two cases might be replicated in the more contagious coronavirus disease given the accounts of social media content that propagate the use of non-scientifically proven cures and prophecies around the globe (Orjinmo, 2020; Bamidele, 2020; Forrest, 2020; Goodman and Giles, 2020; BBC News, 2020).

It, therefore, appears that the global community is not only fighting the COVID-19 pandemic but also the COVID-19 infodemic (Forrest, 2020). As such, this review is required to put social media in perspective as a source of COVID-19 information and provide workable recommendations that can address the infodemic around the pandemic.

COVID-19 INFORMATION MANAGEMENT

In every emergency, accurate and timely information is imperative for responsive interventions. As, June Kaminski, the current curriculum coordinator of a BSN advanced entry nursing program at Kwantlen Polytechnic University and Editor-in-Chief of the online journal of nursing informatics observed, information is essential in coordinating every aspect of COVID-19 interventions (Kaminski, 2020). She maintained that special attention would be needed from informatics specialists (IS) and Information Technologists (IT) to effectively manage COVID-19 information. Such attention, as

captured in her six-point objectives, includes those directed towards mass notification, equipment disinfection, client information, client teaching, system interoperability, and privacy of health data. Regrettably, some of these objectives appear the crust of the controversies surrounding COVID-19 information management. The privacy of health data, for instance, accounts for the growth in the level of distrust in COVID-19 information in most developing countries (Aiyewumi and Okeke, 2020).

Aiyewumi and Okeke (2020), however, observed that citizens' demand for disclosure of the identity of COVID-19 patients can be one probable evidence required to prove the substance of the COVID-19 beyond a reasonable doubt in countries like Nigeria. They pointed out some other issues that stand to compromise COVID-19 information. Among these issues are; the issue of "qualified immunity" for Blacks against coronavirus. This very propaganda was widely speculated that the Blacks, who are mostly of African origin, are totally immune to coronavirus. And secondly, that COVID-19 was a variant of fever or malaria. A case well propagated in most parts of Africa including Nigeria. And thirdly, that coronavirus cannot survive in tropical climates. Although most of these speculations have already been dispelled on so many fronts, (e.g. CDC's record of COVID-19 infections and fatalities among black communities in tropical climate

regions) they remained indelible in the minds of many who adhere to conspiracy theorist propagandas. This could reflect why some people have continued to violate the CDC guideline especially the mask-wearing mandate and social distancing measures designed to curb the spread of the virus. And it might affect the COVID-19 vaccine acceptance rate within the concerned populations.

Cheng, et al. (2020) identified the CDC's inability to provide accurate but timely information about coronavirus as one of the reasons for the COVID-19 infodemic. Given the novel nature of COVID-19, the CDC become very much cautious in releasing information about the pandemic to avoid the same misinformation it seeks to address. Paradoxically, when the release of such information is paramount to appeal for reason, they are usually released in carefully crafted statements in order to maintain accuracy. The delays associated with this approach have resulted in an information vacuum which might render the CDC information system vulnerable to exploitation by social media conspiracy theorists. Having caught up in the question of how infectious the virus was in the early months of the outbreak revealed the CDC's failure in providing accurate but timely information. Situations like this, as Aiyewumi and Okeke (2020) and Medford (2020) argued would not only instil fear and anxiety into the public consciousness but also create a

breeding ground for misinformation and propaganda around the COVID-19 pandemic.

In their study “COVID-19 infodemic: More retweets for science-based information on coronavirus than for false information”, Redondo-Sama et al. (2020) analyzed how false information and evidence-based information around the COVID-19 pandemic spread on Twitter. They found that false information is more likely to be tweeted than they are retweeted, while evidence-based are more likely to be retweeted than tweeted. Although their finding seems to refute the findings of some studies (e.g. Vosooghi et al., 2018). that suggest that fake news is more likely to be shared in all content categories, but very much consistent with research on the 2014 Ebola outbreak (e.g. Fung et al., 2016) - which shows that after the declaration of the emergency, true information circulated more than false information. What was not known are; the forces that contributed to this trend and whether there can be any geographical variation to it. Their study, however, recommends preventive educational interventions targeted at equipping social media users with the necessary skills required to access evidence-based information and to reject fake news.

PUBLIC ATTITUDE TO SOCIAL MEDIA CONTENT

One field that explained the relationship between social media and COVID-19 information management is

social informatics. Informatics involved various principles and technologies for creating values, defining semantics, and ordering the world through information processing. As Kling (1996) observed, social informatics is a problem-driven study area that emerged with the belief that information and communication technologies (ICTs) and the society in which they operate are in mutual-shaping relationships. And as such, its emphasis is on the relationship between ICTs and the broader social context in which they exist. Sawyer (2000) equally appreciated the importance of informatics in diverse fields such as sociology and anthropology, in explaining ways through which ICTs and the individuals who develop, use and manage them, influence and shape each other in various social contexts.

In their study on the H1N1 pandemic, Lin *et al.* (2014) observed that the adoption of prophylactics (preventive measures) among racial minority communities with a low level of education could depend on their level of trust in information sources. Some other studies (e.g., Ordway, 2020) suggested that community leaders, religious leaders, celebrities, and other personalities could influence individuals’ choice of pandemic information through social media. The current campaign for COVID-19 vaccine acceptance depicts the role this set of influencers plays through their social media handles (Ordway, 2020).

To better assimilate how young adults interact with technology in this time of global information crisis, WHO (2021) reported a collaborative study involving the World Health Organization (WHO), Wunderman Thompson and the University of Melbourne. They investigated how Gen Z and Millennials access COVID pandemic Information. With data collected from approximately 23,500 respondents, aged 18-40 years, in 24 countries across five continents, from late October 2020 to early January 2021, the study revealed that over a half (59.1%) of Gen Z and Millennials studied, admitted having been aware of “fake news” trending around COVID-19 and that they could be able to spot it, with 35.1 % likely to ignore such content. They highlighted the possibility to engage the latter set of respondents actively in countering such content as a challenge. The study, however, revealed that 43.9% of the respondents comprising male and female, reported that they would likely disseminate “scientific” facts and figures on their social media handle. This finding stands to refute a plethora of studies on public attitude to social media which align with the claim that entertaining, funny, and emotional content spread fastest.

In a similar study conducted by Nielsen, et al. (2020) on how people in six selected countries (Argentina, Germany, South Korea, Spain, United States, United Kingdom) access and rate news and information about coronavirus. They used a total of 8,513

samples spread across the six selected countries according to their respective nationally representative sample size. The study found, among other findings, that there were no demographic differences in public attitude to online sources and specifically the social media during the COVID-19 pandemic. They observed, and as it was expected, that younger people use social media as their main source of news while the older population is inclined to broadcast media companies. This could serve to depict the role of age in attitude to information sources as a general trend. While revealing a significant increase in news consumption during the COVID-19 pandemic, they argued that online samples could under represent the consumption rate of non-active online users who are typical of the elderly, indigent population, and those with limited formal education. Unarguably, this population of non-active online users could be relatively higher in developing countries where unemployment, illiteracy, and poverty are on a high scale. And coupled with the level of dependency in developing countries, non-active online users would most likely rely on close relatives and associates who are active online users for news and information.

Antonucci *et al.* (2017), in their study on social relations and technology: continuity, context, and change, examined the quality of relationships in the use of the various medium of communication. The findings of their study, however,

showed that electronically and digitally facilitated mediums of communication like social media created new opportunities to maintain contacts with significant others (i.e, spouse, children, parents, friends, etc). They attributed the universal adaptation to this medium to the reduced cost of communication. However, given the high cost of digital technologies like iPhone, Android phones, and PCs, there might be some variations in the access to social media in countries with a high level of poverty like Nigeria.

Czaja (2017), Delello and McWhorter (2017), and Leist (2013), all pointed out the pros (positives) and cons (negatives) of social media as a medium of communication. Among the positives, are; inclusiveness with an enhanced opportunity to disseminate good news, manage health conditions, seek job advice, and the pleasure of exchanges with friends and loved ones. On the negatives, there was a consensus that this medium of communication would render people vulnerable to harm and victimization in many different ways. In some instances, opinions shared by close or significant others may not represent their personal opinion but that of others reproduced through social media information sharing systems. This could be a major reason why Antonucci et al. (2017) argued that variations in the use and benefits of technology and new social relations that emerged would influence public health in unique ways.

As Cheng, et al. (2020) observed, there were many uncertainties at the initial stage of the COVID-19 pandemic, and people in the affected regions were most likely to engage social media and other online resources for COVID-19-related information. This they argued, was in an attempt to cope with the anxiety and fears associated with the COVID-19 pandemic. And that some might equally engage social media as a result of COVID-19 preventive measures particularly the lockdowns and stay-at-home orders, which limited access to print media like the dailies. Conflicting results from Nielsen, et al. (2020), suggested no significant shift from traditional media sources to digitalized sources.

INFODEMIC AND EXPERT KNOWLEDGE DIVIDE

As Richtel (2020) observed, infodemic promoted false claims and medical disinformation among those that do not believe in science and some others who leverage miraculous cures. And this kind of misinformation could be widely shared in our contemporary societies through various social media platforms. This could influence the public's knowledge about coronavirus and their response to the pandemic. And as dangerous as it may appear, increases the adverse effects of the pandemic on public health, societal polarization, and public distrust in governments, science, and health professionals (WHO, 2020c).

Addressing this problem in Lin' (2020) opinion, required that media sources including social media outlets exercise their corporate social responsibility by disseminating science-based information to the public. The inherent danger in social media, he maintained, is that it would polarize the public into those that accept and those that either reject or doubt scientific facts and figures about COVID-19 and its recommended preventive measures. This was what Hiraki (2020) identified as an information process that involves the democracy-based exchange of risk. It was in the latter's opinion that the only way to bridge the gap would be through intellectual empowerment that emphasizes the co-creation of scientifically valid information needed for the control of the coronavirus. This could be one reason people who have less knowledge about Covid-19 are most likely to violate the COVID-19 prophylactics protocol. As evident in a national survey, adults in this category would frequently participate in large gatherings of more than 50 persons and move around without masks (Clements, 2020).

In the context of the conflict model, Lin (2020) further maintained that information could provoke long-standing issues by promoting ideological conflicts and public disorderliness through disinformation, misinformation, and conspiracy theories. A position equally supported by Nakamura (2020). Both scholars observed that infodemic could distort

and jeopardize governments' and field experts' efforts to implement a science-based solution during a large-scale emergency. And, as such, could undermine interventions put in place to manage a national crisis, environmental hazard, or natural disaster. In the present Covid-19 crisis, Lin (2020 p.667) also observed that its politicization has destroyed lives as well as livelihoods in countries across the globe. This suffices to suggest that the explosion of political violence witnessed in different parts of the world during the pandemic could be influenced by propaganda and fake news that leverage pre-existing emotions, sentiments, and conviction.

As Nakamura (2020) noted, the immediate past president of the United States, Donald Trump's labeling of Covid-19 the "Chinese Virus" – or "Kung Flu" was to energize his campaign for re-election run, using the long-standing conflict between the USA and China. But his "stop the testing now" vibes also exposed his limited knowledge of science because sample collection and testing would be a precursor to any meaningful solution to the COVID-19 pandemic. This implies that most of his fans would adhere to his ideologies over the pandemic, including "rejection" of mask-wearing mandate, acceptance of hydroxychloroquine and injection of disinfectant as alternative cure for coronavirus, even as he admitted having a limited medical background (Goodman and Giles, 2020; BBC News, 2020). Experiences like this,

however, wouldn't be peculiar to President Trump and the United States but could be very much diffused in other countries across the globe.

Orjinmo (2020) and Bamidele (2020), reported some accounts of misinformation in the form of miracle COVID-19 cures and prophecies in some African countries. These sources revealed that the so-called "men of God" from mostly Africa professed to have the power of curing disease through laying of hands on forehead of the infected persons. An example of this set of "miracle workers" is the Cameroonian pastor Franklin Ndifor who died of the virus himself. Among those that leveraged "divine prophecy" were the likes of the popular Nigerian pastor T.B. Joshua (also late) who once claimed divinity of inspiration in predicting the end of COVID-19 by 27th of March, 2020. Some others, like Pastor Chris Oyakhilome of the Christ Embassy church, constructed conspiracy theories around the nature and the causes of the disease. Through his conspiracy theory, Pastor Chris, linked the coronavirus to the 5G network expansion project purportedly as a deliberate attempt to create a new world order (Orjinmo, 2020).

In the absence of expert-knowledge, all these, while grossly unfounded, would be geared towards establishing and sustaining spiritual powers and political office positions than providing a real solution to the pandemic.

CONCLUSION AND RECOMMENDATION

Blaming social media for the ills of infodemic is like blaming a bucket for containing contaminated water. This paper has revealed that social media has been both effective and efficient in the dissemination of information, misinformation, and disinformation in the post-COVID-19 era. Literature reviewed has shown that individuals, regardless of their age, gender, educational background, and their economic status, would incline to only information sources and content that were appealing to their pre-existing emotions, sentiments and convictions. As such, both political and religious leaders would exploit such vulnerabilities in construction of conspiracy theories which usually promote non-scientifically proven cures and preventive measures. As the paper further revealed, the infodemic around COVID-19, could account for the incessant violation of COVID-19 protocol, polarisation of the society, rejection of scientifically proven cures and vaccines, and increased number of fatalities during the pandemic.

This paper, therefore, recommends as follow:

- Sensitization of the general public on implication of the use of non-scientifically proven cures and preventive measures for disease prevention and control.
- Development of public health programmes to promote public

trust in global health information system.

- A clear-cut separation of religion and politics from public health issues.

REFERENCES

- Aiyewumi, O., and Okeke, M. I. (2020). The myth that Nigerians are immune to SARS-CoV-2 and that COVID-19 is a hoax are putting lives at risk. *Journal of Global Health*. <http://www.jogh.org/document/issue202002/jogh-10-020375.htm>.
- Antonucci, T. C., and Ajrouch, K. J., and Manalel, J. A. (2017). Social relations and technology: continuity, context, and change: *Innovation in Aging*, 2017, Vol. 1(3), 1–9 doi:10.1093/geroni/igx029.
- Bamidele, M. (2020). Pastor Who Claimed He Could Cure Coronavirus Dies After Contracting The Virus. *Guardian News Nigeria*. <https://guardian.ng/life/pastor-who-claimed-he-could-cure-coronavirus-dies-after-contracting-the-virus/>.
- BBC News. (2020). Coronavirus: Outcry after Trump suggests injecting disinfectant as treatment. *British Broadcasting Cooperation*. <https://www.bbc.com/news/world-us-canada-52407177>.
- Bukhari, W. (2020). Role of Social Media in COVID-19 pandemic: *International Journal of Frontier Sciences*, Vol. 4(2), 59-60. Doi: 37978/tijfs.v4i2.144.
- Brennen, J. S., Simon, F. M., Howard, P. N., & Nielsen, R. K. (2020). Types, sources, and claims of COVID-19 misinformation. *Reuters Institute*. <https://reutersinstitute.politics.ox.ac.uk/types-sourcesand-claims-covid-19-misinformation>.
- Cheng, C., Ebrahimi, O. V., and Lau, Y. (2020). Maladaptive coping with the infodemic and sleep disturbance in the COVID-19 pandemic. *Wiley Public Health Emergency Collection*. e13235. PMC7744904. Doi: 10.1111/jsr.13235
- Cinelli, M., Quattrocioni, W., Galeazzi, A., Valensise, M. C., Brugnoli, E., Schmidt, A. L., Zola, P., Zollo, F., and Scala, A. (2020). The COVID-19 social media: *Science Report*, Article 10, 16598. Doi: <https://doi.org/10.1038/s41598-020-73510-5>.
- Czaja, S. J. (2017). The potential role of technology in supporting older adults. *Public Policy and Aging Report*, 27, 44–48. doi:10.1093/ppar/prx006.
- Delello, J. A., & McWhorter, R. R. (2017). Reducing the digital divide: Connecting older adults to ipad technology. *Journal of Applied Gerontology: The Official Journal of the Southern Gerontological Society*, 36, 3–

28. Doi: 10.1177/0733464815589985.
- Eysenbach, G. (2020). How to Fight an Infodemic: The Four Pillars of Infodemic Management *Journal of Medical Internet Research*, Vol. 22(6):e21820 URL: <https://www.jmir.org/2020/6/e21820>. DOI: 10.2196/21820.
- Fernández-Torres, M. J., Almansa-Martínez, A., and Chamizo-Sánchez, R. (2021). Infodemic and Fake News in Spain during the COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, 18, 1781. <https://doi.org/10.3390/ijerph18041781>
- Fung IC-H, Fu K-W, Chan C-H et al. (2016) Social media's initial reaction to information and misinformation on Ebola, August 2014: Facts and rumors. *Public Health Reports* 131(3): 461–473.
- Goodman, J., and Giles, C. (2020). Coronavirus and hydroxychloroquine: What do we know? *British Broadcasting Cooperation*. <https://www.bbc.com/news/51980731>.
- Griffin, A. (2014). Ebola outbreak: Millionaire preacher TB Joshua 'sends 4,000 bottles of holy water to Sierra Leone as cure. *Independent News UK*. <https://www.independent.co.uk/news/world/millionaire-preacher-sends-4-000-bottles-holy-water-ebola-cure-9674136.html>.
- Hagiya, M. (2015). Defining informatics across Bun-kei and Ri-kei. *Journal of Information Processing*, Vol. 23(4), 525-530. Doi: 10.2197/ijip.23.525.
- Hiraki, T. (2020). The COVID-19 infodemic and intellectual empowerment. *Journal of Civilization*, Vol. 27 (Special Issue of COVID-19), 7-17.
- Jaiswal, J., LoSchiavo, C., and Perlman, D. C. (2020). Disinformation, misinformation and inequality-driven mistrust in the time of covid-19: lessons unlearned from aids denialism. *Nature Health Emergency Collection. AIDS Behav.* 1–5. doi: 10.1007/s10461-020-02925-y. PMID: 32440972.
- Kling, R. (1996). *Computerization and controversy; Value conflicts and social choices* (2nd ed.). San Diego, CA: Academic Press.
- Kouzy, R., Abi Jaoude, J., Kraitem, A., El Alam, M. B., Karam, B., Adib, E., Zarka, J., Traboulsi, C., Akl, E., & Baddour, K. (2020). Coronavirus goes viral: Quantifying the COVID-19 misinformation epidemic on Twitter. *Cureus*, 12, e7255 10.7759/cureus.7255 [PMC free article] [PubMed] [CrossRef] [Google Scholar]
- Leist, A. K. (2013). Social media use of older adults: A mini-review. *Gerontology*, 59, 378–384. doi:10.1159/000346818.

- Lin, C. A. (2020). A Year like No Other: A Call to Curb the Infodemic and Depoliticize a Pandemic Crisis. *Journal of Broadcasting & Electronic Media*, 64:5, 661-671, DOI: 10.1080/08838151.2020.1871185.
- Lin, L., Savoia, E., Agboola, F., & Viswanath, K. (2014). What have we learned about communication inequalities during the H1N1 pandemic: A systematic review of the literature. *BMC Public Health*, 14(1), 484. <https://doi.org/10.1186/1471-2458-14-484>.
- Nielsen, R. S., Fletcher, R., Newman, N., Brennen, J., & Howard, P. N. (2020). Navigating the infodemic: How people in six countries access and rate news and information about coronavirus. Reuters Institute for the Study of Journalism. <https://www.politico.eu/wp-content/uploads/2020/04/Navigating-theCoronavirus-infodemic.pdf>.
- Medford, R. J., Saleh, S. N., Sumarsono, A., Perl, T. M., and Lehmann, C. U. (2020) An “Infodemic”: Leveraging High-Volume Twitter Data to Understand Early Public Sentiment for the Coronavirus Disease 2019 Outbreak: *Open Forum Infectious Diseases*, Volume 7, Issue 7, July 2020, ofaa258, <https://doi.org/10.1093/ofid/ofaa258>.
- Ordway, D.M. (2020, April 28). How we can improve public health messaging about COVID-19. The Harvard Kennedy School (HKS), Journalist’s Resource. <https://journalistsresource.org/studies/society/public-health/public-healthmessaging-coronavirus/>.
- Orjinmo, M. (2020). Coronavirus: Nigeria's mega churches adjust to empty auditoriums. BBC News, Lagos. <https://www.bbc.com/news/world-africa-52189785>.
- Pulido, C. M., Villarejo-Carballido, B., Redondo-Sama, G., and Aitor, G. (2020). COVID-19 infodemic: More retweets for science-based information on coronavirus than for false information. *International Sociology*, Vol. 35(4) 377–392.
- Richtel, M. (2020). W.H.O. Fights a pandemic besides coronavirus: An ‘infodemic’, *The New York Times*. <https://www.nytimes.com/2020/02/06/health/coronavirus-misinformation-social-media.html>.
- Sawyer, S. (2000). Social informatics in the information sciences: Current activities and emerging directions. *Information Science Research Journal*, Vol. 3(2), 89-95.
- Sterk, E (2008). Filovirus haemorrhagic fever guideline.

- Barcelona: Médecins Sans Frontières, p. 39-48.
- Forrest, A. (2020, 28 April). Coronavirus: 700 dead in Iran after drinking toxic methanol alcohol to 'cure Covid-19'. Independent News UK. <https://www.independent.co.uk/news/world/middle-east/coronavirus-iran-deaths-toxic-methanol-alcohol-fake-news-rumours-a9487801.html>
- United Nations. (2020). UN tackles 'infodemic' of misinformation and cybercrime in COVID-19 drisis. <https://www.un.org/en/un-coronavirus-communications-team/un-tackling-%E2%80%98infodemic%E2%80%99-misinformation-andcybercrime-covid-19>.
- Vosoughi S, Roy D and Aral S (2018) The spread of true and false news online. *Science* 359(6380): 1146–1151.
- WHO. (2014). Ebola: Experimental therapies and rumoured remedies. Ebola situation assessment. World Health Organization. <https://www.who.int/mediacentre/news/ebola/15-august-2014/en/>
- WHO. (2020a, April 15). Coronavirus disease 2019 (COVID-19) situation report – 85. World Health Organization. https://www.who.int/docs/default-source/coronavir use/situation-reports/20200415-sitrep-86-covid-19.pdf?sfvrsn=c615ea20_2.
- WHO. (2020c, December 11). Call for action: Managing the infodemic. World Health Organization: <https://www.who.int/news/item/11-12-2020-call-for-actionmanaging-the-infodemic>.
- WHO. (2021). Social media & COVID-19: A global study of digital crisis interaction among Gen Z and Millennials. World Health Organisation. <https://www.who.int/news-room/feature-stories/detail/social-media-covid-19-a-global-study-digital-crisis-interaction-among-gen-z-and-millennials>.