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Social Implications of Infodemic Concurrent with COVID-19

Abstract: The scale of disinformation surrounding the COVID-19 pandemic has been called infodemic. It involved disseminating various messages and theories that had a significant negative impact on limiting the spread of the disease but also exacerbated existing social antagonisms and emboldened and radicalised fringe groups. Infodemic, to a large extent manifested in social media, also fostered the formalisation of denialist circles, who transferred their sometimes very aggressive sentiments from the web to the real world. Negation and contestation of the pandemic were partly born spontaneously but were also created as part of postmodern hybrid activities. Consequently, narratives of infodemic led to difficulties in functioning health services, but above all, to an increase in morbidity and mortality related to COVID-19. The consequences of the infodemic would also include various economic effects, such as increased medical expenses for unvaccinated people or turbulence in the labour market.

Keywords: *infodemic, COVID-19, disinformation, misinformation, malinformation*

Introduction

It seems that the outbreak of a global pandemic in a globalised world was only a matter of time. The awareness of the potential of this threat should result, if only, from the not-too-distant first signals of the possibility of performing such a scenario. The problem, despite its spectacular nature, also present in pop culture, did not appeal successfully enough to the public consciousness as well as to the consciousness of decision-makers. Few believed that, after all, it could come true; or maybe it is a question of repression, conjuring reality, and the delusion that the existing mechanisms, structures and knowledge can prevent a tragedy on a larger scale. Nevertheless, despite the disbelief that it was possible, the pandemic became

a fact and found us unprepared. To date, it has involved nearly 430 million people, of which nearly 6 million have died. Although its end is slowly being announced, it is impossible to say that the world is over it. However, after all, despite the exposure to various shortcomings of all functioning institutions and mechanisms, we should talk about coping with the pandemic in terms of success, not failure.

The „Spanish flu” virus, which, if we want to do historical justice, should be called „American flu”; the virus, contagiousness of which is compared to SARS-CoV-2, and which led to the disease of nearly 500 million people, claimed, according to various estimates, from 50 million even up to 100 million victims. The scale of this tragedy allows us to compare it to the severity of demographic losses caused by world wars. Therefore, it should be recognised that, despite all the imperfections accompanying the struggle with the pandemic, the reduction of the COVID-19 mortality rate is at least several times better than a hundred years ago. It is not 10%, or even more than then, but only about 1.4%.

However, there is no doubt the current pandemic is a traumatic experience. The surprise, disbelief and shock that accompanied it in the first months significantly disturbed the sense of stability and security in many dimensions, but at the same time, caused hunger for information, resulting in the premature publication of unsubstantiated content and rash provision of unverified information. It also prompted people to search for answers concerning the essence of the pandemic, its origins, and methods of treatment. For some, it was also an opportunity to ask questions about its deeper, hidden purpose or meaning.

In an unjustified sense of their own omnipotence, some have made up their minds about the pandemic based on available, as already mentioned, not necessarily reliable information. Some listened to what others had to say and accepted or rejected possible suppositions or assertions.

The author aims to show the social implications of the infodemic concurrent with COVID-19. The analysed issues were presented from an interdisciplinary perspective, taking into account the approach of political science and security science. In the article, there were applied quantitative and qualitative methods. The analysis and description surveys were based on the use of descriptive statistics. There were also analysed documents and communications regarding misinformation, disinformation and malinformation of the pandemic, including the last of these elements, as well as explanation and inference.

Infodemic

Public figures (including politicians, celebrities) played a special role in the distribution of disinformation, as evidenced by, for example, Reuters Institute research. Although their percentage share among those disseminating such information is not dominant (20%), sometimes the undeserved authority of such people makes them considered a reliable source of information, strengthening the range of negative impact (Brenne et al., 2020, pp. 1–2, 5; Marszałek-Kawa & Plecka, 2019).

This phenomenon is also significantly influenced by the fact that some disinformation narratives do not arise spontaneously, as if at the grassroots, as an inept attempt to find answers to questions about the essence of events in difficult times, but are a tool of information warfare. Namely, they are created on behalf of and in the interest of entities trying to achieve their goals through it. In our part of the world, the Russian Federation is the leader in this area (Marcinkowski & Sikorski, 2022; Sikorski, 2021), as it is well-known today.

There is no doubt that the messages and narratives related to the pandemic have dominated the infosphere for a while. The infosphere, which, as a consequence of technological development over the last few decades, has significantly changed its structure, and due to the scale and pace of news distribution, also creates much greater opportunities for abuse.

This information boom concerning COVID generated such an oversupply of information at the beginning of the pandemic that it was referred to as an infodemic. Although the excess is an unfavourable phenomenon, a much more severe threat, in this case, was the frighteningly large share of faulty or outright erroneous or false information.

Meanwhile, a comprehensive analysis of the infodemic seems impossible, which is a natural consequence of the complexity of the infosphere in which it takes place. However, it is undoubtedly dominated by the so-called new media and, above all, social media, the share of which, according to research conducted at the beginning of the pandemic, accounts for about 90% (Brenne et al., 2020, pp. 1–2, 4), and in which traffic, as it turns out, is largely generated by bots. It is confirmed by the analyses made via the “COVID-19 Infodemic Observatory” platform. They show, among other things, that among the 1.6 billion tweets related to the pandemic published on Twitter alone, about 40% are shared by them (Gruzd et al., 2021, p. 13). Moreover, there is already scientific evidence that disinformation campaigns are coordinated and that content published through low-credibility accounts is disseminated more intensively than content from highly reliable sources. The research also shows that Twitter (32%) more often publishes low-credibility content than Facebook (21%) (Yang et al., 2021, p. 1). Nevertheless, as comes from these findings, making a certain generalisation, it should be said that about one-fifth to one-third of the content distributed on social media is information of questionable quality. The only verified untrue facts about the virus in just over a year of the pandemic, the “Google Fact-Check Tools” recorded more than 7,000 (Gruzd et al., 2021, p. 2). Only false facts, let us emphasise!

In August 2020, an international team of researchers led by Md Saiful Islam published its research in “The American Journal of Tropical Medicine and Hygiene” entitled *COVID-19 – Related Infodemic and Its Impact on Public Health: A Global Social Media Analysis*. The authors tracked pandemic reports published in 25 languages in 87 countries that circulated on online platforms and social media. The research covered the first quarter of the year. Out of nearly 2,300 reports they examined, 82% were found to be false (Islam et al., 2020, p. 1621).

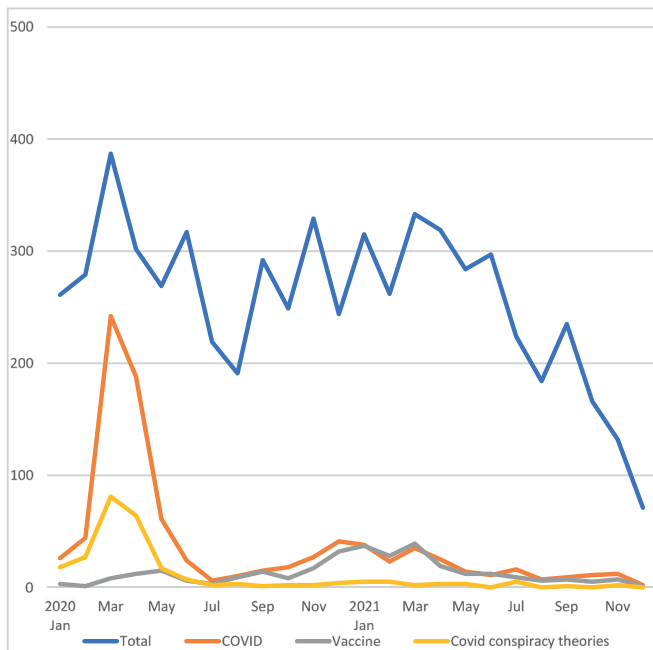
A slightly different perspective on the scale of the infodemic is provided by the analysis of the publicly available database of disinformation reports conducted by the East StratCom Task Force, which is part of the European External Action Service. There, first of all, false

information is noted, the issuers of which are internet portals. The multilingual versions of Sputnik News dominate among them.

Over the last two years (2020–2021), the number of all verified false facts recorded was approximately 6,160. The vast majority of them (3,339) were included in the database in the first year of the pandemic. Also, the largest number of reports on COVID-19 was recorded – over 700. In the following year, there were just over 200. Clear disproportions. It would seem that the infodemic is losing strength, and in fact, it is so. However, it should be remembered that these data refer only to published disinforming reports. Their service life, resulting from dissemination using various tools in the network, is much longer, and the range is even incomparably greater¹.

The analysis of the collected data allows concluding that, by far, the most infodemic disinformation narratives were introduced to the infosphere at the beginning of the pandemic, in March and April 2020. The levels from those months were not reached even once in the following time. The decline in total disinformation reports in the declining period of 2021 should be carefully interpreted. Perhaps this is due to the time-consuming preparation of credible comments by the East StratCom team.

Figure 1. Overall disinformation reports on COVID-19, vaccines, and pandemic-related conspiracy theories recorded on East StratCom in 2020–2021



Source: own study based on the data available in the euvdisinfo.eu database on February 16, 2022.

¹ All the data come from the database available at euvdisinfo.eu on 14 February 2022.

The general tendency in disinformation narratives about the pandemic is reflected in the overall level of disinformation. Reports classified as conspiracy theories, including those on the pandemic, also increased proportionally at that time. In the last quarter of 2020, the number of false reports about vaccines, not only those immunising against COVID-19, increased. The upward trend in this regard collapsed in March 2021.

Based on the database available on the euvdisinfo.eu portal, we can assume that the share of “disinfodemic”, because we should probably use this term in this context, in all false reports recorded, accounts for less than 16% of the total. I do not analyse the infodemic narratives in more detail. Numerous examples can be found in journalistic analyses and the scientific literature on the subject, for example, in the interesting book by prof. Agnieszka Demczuk (2021).

It is worth noting, however, that the quoted values, to some extent, allow us to describe the phenomenon of infodemic but do not define the actual scale of the phenomenon. And yet, as shown by many different analyses, the “disinformation potential” of such false messages can be measured in hundreds, thousands or even millions of views or further publishing.

Implications

We can use various proposals relating to its components for a detailed description and analysis of the infodemic. Using Claire Wardle’s model of information disorders, we could present its structure through misinformation, disinformation, and malinformation (Demczuk, 2021, pp. 45–46). This proposal sometimes extends to two additional categories: fake news and conspiratorial thinking (including conspiracy thinking and conspiracy theories). It does seem, however, to be somewhat debatable (Duplaga, 2020, p. 7818). From the perspective of the infodemic’s harmfulness or social consequences, it seems enough to structure it as follows: rumours, slander, conspiracy theories and stigmatising information². Based on these categories, I try to present the consequences of COVID disinformation.

Rumours are promulgated messages that have not been verified and, at the same time, are the result of a search for simple answers to complex questions. In the infodemic, to a large extent, they referred to unproven information on disease transmission, mortality rate, possible treatments, their effectiveness, and actual and potential infection reduction and control measures. If they did not deny the pandemic, they often contained allegedly scientifically proven prescriptions for fighting it or contested recommended conservation measures, disregarding scientific evidence.

Some of these reports did not directly threaten health or life. For example, the alleged medicinal properties of milk, garlic, zinc, antimalarial drugs, vitamins C and D, and recommendations not to eat raw meat or avoid contact with animals. However, they built misconceptions about the source of infections and the acquisition of effective immunity, giving the illusion of improved safety. That by itself could already pose a threat.

² The presented classification is an extension of the suggestions of S. Islam and the team.

However, the rumours about immune-boosting and virus-neutralising liquid preparations, or even chemicals, popular in the first phase of the pandemic in various parts of the world, were far more fateful. For example, in Iran, the most severely affected by the pandemic among the Middle East countries, fear of disease, lack of reliable official information and false rumours about the healing properties of various drugs made over 5,000 people poisoned with methanol in an attempt to prevent the disease. About a hundred of them have lost or damaged their eyesight. 728 people did not survive the ingestion of the poison. The percentage of those victims of the infodemic, in relation to COVID deaths at the same time, was about 11-12% (Delirradl & Mohammadi, 2020, p. 347; Al Jazeera, 2020). In South Korea, in one of the churches, the belief that salt water would save the faithful from infection led to the poisoning of over a hundred participants in the liturgy. Similar practices have also been observed in other churches around the world (Islam et al., 2020, p. 1621).

It is hardly surprising, however, that ordinary people succumb to unverified information since even politicians are influenced by them, including the president of one of the most powerful countries, spreading information about the supposedly beneficial effect of intravenous disinfectants.

Another category of infodemic narratives is slander. These are false reports intended to discredit, humiliate or ridicule a person. Mostly, the names of well-known people who are attributed to various mischiefs are dominant, often binding them into larger conspiratorial structures. These, in turn, being most often unreal or not very realistic scenarios, create and demonise the enemy but also weave catastrophic visions of the future, which fall on fertile ground in the face of the crisis.

Confidence in these types of narratives is surprisingly common. According to research conducted in various countries, it is about half the population. However, those who believe in such narratives become especially radicalised when belief in them creates a group identity (Önnerfors, 2021, p. 17). We should not evaluate all conspiratorial concepts in an unambiguously negative way. However, a significant part of them seems to pose a severe threat on many levels. First of all, they lead to the rejection or misinterpretation of expert medical knowledge and distrust of various public entities and their intentions. They deepen and accelerate social polarisation and, thus, radicalisation. The growing distrust of power fuelled by irrational theories may also lead to an escalation of extremism. An example of this can be the Danish “Men in Black” movement, which considers itself a group of conscious people. A movement that actively defends specifically understood civil liberties, including the unconscious part of society. It does so by fighting in the streets with the support of football hooligans.

Movements of this type have succeeded in transferring online protest to activity in classic street demonstrations. It was the case in many cities, such as Berlin, London, Copenhagen and Stockholm, where the limitations related to the pandemic were contested. The possibility of protesting out into the streets is the statutory right to freedom of speech, but such actions have seriously radicalised during the pandemic. An example is an anti-COVID demonstration in Berlin at the end of August 2020. The protest, organised as a European one, gathered

around 40,000 people, including extremists of various origins, also neo-Nazis. As we know, it ended with an assault on the Reichstag (Wprost, 2020). A few months later, dramatic events, fuelled by anti-COVID contestation, also took place at the US Capitol (Wprost, 2020, p. 18). The tragic incident in Germany, where a gas station customer shot a salesman after a mask-wearing-related brawl, showed how strong the emotions accompany infodemic rumours and conspiracy theories and how deadly they can be (Avaaz, 2021, p. 2).

Doctors active in the media on the front of the fight against the infodemic were also unable to feel safe. According to a study published in October 2021, 3% of them have experienced physical attacks, 15% have faced death threats, and 22% have faced physical or sexual violence threats. One-third of these doctors considered that this greatly impacted their willingness to perform in public (Nogrady, 2021, pp. 4–5).

It should be noted that at least a few international conspiracist associations were created during the pandemic and the infodemic, including the World Freedom Alliance (WFA) promoting alternative knowledge concerning disease and vaccines, as well as coordinating anti-coronavirus protests and bringing together frustrated and unfulfilled scientists and ex-doctors. This organisation works closely with a few months older World Doctors Alliance (WDA), whose leader recently published a book entitled *Game over*. He combined the attacks of September 11, 2001 with the pandemic (McGreevy, 2021; Chequeado, 2021; Heiko Schöning, 2022).

It should also not be forgotten that such disintegrating actions can and are also an element of the information war of foreign powers. Proof of this may be the involvement in distributing narratives of this type of extreme right-wing and populist websites and blogs, whose not-always hidden connections direct us towards Russia (Propagandaschau, 2022). But it was also noticeable that local RT TV branches supported them. So they pose a threat to democracy. It is worth noting that the rejection of scientific logic is a characteristic component of populism. Hence, countries ruled by populists who listen to conspiracy concepts, such as Brazil or the US at one time, were late in fighting the pandemic.

EUvsDisinfo analyses unequivocally indicate that the infodemic in Europe, which is a series of antagonising narratives, is, to a large extent, a Russian campaign of influence, allegedly revealing weakness and prophesying the imminent collapse of the EU. The expression of that was supposed to be the numerous published arguments about its incompetence in the crisis, undermining the so-called traditional values and suggestions that the EU was a continuation of the Third Reich. Effect? The collapse of confidence in the EU institutions. In Italy, at the very beginning of the pandemic, in a period particularly difficult for this country, the drop was from 42 to 27% (De Palo, 2020).

It should be added that the dissemination of some conspiracy theories, e.g., concerning 5G technology and its participation in the transmission of the virus, led to acts of vandalism and abuse in at least a few countries. In turn, those concerning the alleged harmfulness of vaccinations or their use to control society led to the development of herd immunity to COVID-19 has been significantly slowed down in many countries (Fildes et al., 2020).

Narratives, often conspiratorial concerning all kinds of vaccines, have also been used as an instrument of disinformation for a long time. For some time in Poland, there has been a growing disregard for statutory obligations in this respect. Nevertheless, just before the pandemic outbreak, as many as 93% of Poles believed that vaccination was the most effective protection against disease (*Stosunek do szczepień*, 2019, p. 1). Three years later, only 51% of compatriots are fully vaccinated against the virus (Czystowski, 2022), which caused the greatest pandemic in a century.

Another harmful form of infodemic narratives is stigmatisation, a phenomenon of social stigma with a pejorative connotation. It is associated with social condemnation and often also rejection. In the context of the pandemic, it expressed a negative attitude and discrimination against people who were directly or indirectly affected by the disease, were particularly vulnerable to falling ill because of their profession, travelled from regions with high incidence or were simply of Chinese origin.

Homeowners and neighbours have been intimidating, insulting, or discriminating against healthcare workers in at least a few countries. They were denounced or blocked from accessing houses and flats (Islam et al., 2020, p. 1621).

Hostility towards the health service was also manifested in attacks on its property. It was the case in Abidjan, where a COVID-19 research facility suspected of spreading the disease was devastated. There was an attack by Sierra Leone fishermen on the health centre and police station after limiting the number of boats that could go fishing. There was also the case of the taxi drivers' strike in Guinea due to the restrictions on the use of taxis, followed a few weeks later by demonstrations against the travel restrictions, during which several protesters were killed by the police (Seytre, 2020, p. 587).

Ethnic stigmatisation, racist stigmatisation, was favoured by social moods formed at the grassroots resulting from fears and fuelled by the irresponsible statements of some politicians. They referred to the virus as „Chinese” or „Wuhan virus”. Shameful publications in the press also favoured it, sometimes widely read, such as a column published in the “Wall Street Journal” by prof. Walter Russell Mead, entitled *China Is the Real Sick Man of Asia* (Mead, 2020; Graham-Harrison & Kuo, 2020). The Chinese experienced stigmatisation in various regions of the world by doctors, children, and other people evacuated from Wuhan, e.g., to Ukraine. This hatred was previously fuelled by social media (Islam et al., 2020, p. 1623).

No wonder the social ostracism that sometimes accompanies the disease led some infected to try to hide this fact from healthcare professionals and avoid screening. It contributed to the transmission of the disease.

Attention should be paid to how the infodemic has changed the role of the media, in which the sources of searching for medical information have now become social media, including Facebook or websites such as YouTube. The interest in sometimes-absurd concepts presented in them aroused surprisingly high interest. The accounts of so-called Russian trolls, as well as those largely stimulating Internet traffic, the so-called bots, played a significant role in disseminating this content (Jarynowski et al., 2020, pp. 8, 10, 12–13).

The influence of traditional online media cannot be forgotten either. It may be surprising that the leading among them was private media, and until recently, it should be disturbing that the widely recognised media was surpassed by Sputnik Polska, leaving behind such media offices as Wprost, Onet, Gazeta Prawna, and Gazeta.pl (Jarynowski et al., 2020, p. 10).

Conclusion

It should be stated that an infodemic threatens the individual and society on at least several levels. On the one hand, social frustration and emotions conduce to increased susceptibility to unverified information in times of crisis. Despite widespread access to reliable knowledge, some societies accept and acknowledge as their own the views opposed to scientific rationalism. Ignoring them, they underestimate the seriousness of the situation and pose a threat to their own health and life, but also their relatives and bystanders. It complicates effective crisis management to restrain and combat the pandemic and undermines authorities' interpersonal and social trust. Historically, we have had the opportunity to observe the effects of disorientation in societies in the face of spreading disease. It was the case with both the Ebola and HIV epidemics. In South Africa, denial of antiretroviral therapy led to at least 343,000 deaths (Bateman, 2007, pp. 912–914).

In addition, the infodemic antagonised and radicalised opponents through brutalising extremism. It is becoming a threat to public health and democracy. It is used for internal political struggle but also to prepare the ground for the activity of hostile state centres, for which disinformation is an element of postmodern hybrid activities.

Finally, measurable effects of the infodemic are excessive burdens on health care, which could be avoided, at least in part, by following the medical community's recommendations regarding prophylaxis, including vaccinations. It increases the number of deaths from COVID, but it also contributes directly and indirectly to the increase in mortality from other causes. It makes it difficult and slows the fight against the pandemic by undermining trust in medics. It also has real economic consequences, hitting the labour market, through not only the deaths of people in productive age but also due to sickness absences or later complications, also associated with a decrease in physical or mental capacity.

Moreover, it seems that the scale of the infodemic finally made the problem of disinformation publicly recognised. Studies on the scope of its impact have been intensified, but also on the effectiveness of the so-called strategic communication. The latest research proves that fact-checking effectively lowers faith in disinformation by nearly 12%, which gives hope for the future (Porter & Wood, 2021, pp. 4–6).

Infodemic also made us aware that the activities undertaken by the so-called Big Tech, in terms of its limitation, have been insufficient, and the fact that the attitudes of the majority of the companies are driven by the need to generate profits, which necessitates the introduction of new legal acts regulating the functioning of this market.

References:

- AVAAZ. (2021, January 21). *Scientists under Attack. How health experts became targets on Facebook & Co.*
- Bateman, C. (2007). Paying the price for AIDS denialism. *South African Medical Journal*, 97.
- Brenne, J. S., Simon, F., Howard, Ph. N., & Nielsen, R. K. (2020). *Types, sources, and claims of COVID-19 misinformation*. <https://reutersinstitute.politics.ox.ac.uk/types-sources-and-claims-covid-19-misinformation>
- Centrum Badań Opinii Społecznej. (2019). *Komunikat z badań nr 9/2019, Stosunek do szczepień ochronnych dzieci*.
- Czystowski, R. (2022, March 28). *Ile osób zaszczepiono na COVID-19 w Polsce*. <https://300gospodarka.pl/live/ile-zaszczepiono-na-covid-polska>
- De Palo, F. (2020). *W la Cina! Il sondaggio Swg che non ti aspetti. Parla Pier Ferdinando Casini*. <https://formiche.net/2020/04/cina-usa-sondaggio-swg-casini-ventura>
- Delirradl, M., & Mohammadi, A. B. (2020). New Methanol Poisoning Outbreaks in Iran Following COVID-19 Pandemic. *Alcohol and Alcoholism*, 55(4).
- Demczuk, A. (2021). *SARS-CoV-2 i COVID-19. Plotki, dezinformacje i narracje spiskowe w polskim dyskursie publicznych*.
- Duplaga, M. (2020). The Determinants of Conspiracy Beliefs Related to the COVID-19 Pandemic in a Nationally Representative Sample of Internet Users. *International Journal of Environmental Research and Public Health*, 17(21).
- Fildes, N., Di Stefano, M., & Murphy, H. (2020, April 16). How a 5G coronavirus conspiracy spread across Europe. *Financial Times*.
- Graham-Harrison, E., & Kuo, L. (2020, February 19). China to expel WSJ journalists over ‘malicious’ coronavirus column. *The Guardian*.
- Gruzd, A., de Domenico, M., Sacco, P. L., & Briand, S. (2021). Studying the COVID-19 infodemic at scale. *Biga Data & Society*, 1–6.
- Heiko Schöning. (n.d.). https://www.psiram.com/de/index.php/Heiko_Schöning
- Iran: Over 700 dead after drinking alcohol to cure coronavirus*. (2020, April 27). <https://www.aljazeera.com/news/2020/4/27/iran-over-700-dead-after-drinking-alcohol-to-cure-coronavirus>
- Islam, M. S., Sarkar, T., Khan, S. H., Kamal, A.-H. M., Hasan, S. M. M., Kabir, A., Yeasmin, D., Ariful Islam, M., Chowdhury, K. I. A., Anwar, K. S., Chughtai, A. A., & Seale, H. (2020). COVID-19–Related Infodemic and Its Impact on Public Health: A Global Social Media Analysis. *The American Journal of Tropical Medicine and Hygiene*, 103(4).
- Jarynowski, A., Wójta-Kempa, M., & Belik, V. (2020). Percepcja „koronawirusa” w polskim internecie do czasu potwierdzenia pierwszego przypadku zakażenia SARS-CoV-2 w Polsce. *Pielęgniarstwo i Zdrowie Publiczne*, 10(2).
- Koronasceptycy próbowali wtargnąć do Reichstagu. W proteście w Berlinie uczestniczył Grzegorz Braun (2020, August 13). *Wprost*.
- Marcinkowski, T., & Sikorski, J. (2022). The Europeans Unions Policy Towards the COVID-19 Crisis and the Russian Contribution to Infodemic. In N. Moch, W. Wereda, & J. Stańczyk (Eds.), *Information, Security and Society in the COVID-19 Pandemic*.
- Marszałek-Kawa, J., & Plecka, D. (Eds.) (2019). *The Dictionary of Political Knowledge*. Wydawnictwo Adam Marszałek.
- McGreevy, R. (2022, March 22). UCD academic Dolores Cahill resigns as chair of the Irish Freedom Party.

- The Irish Times*. <https://www.irishtimes.com/news/ireland/irish-news/ucd-academic-dolores-cahill-resigns-as-chair-of-irish-freedom-party-1.4517109>
- Mead, W. R. (2020, February 3). China Is the Real Sick Man of Asia. *The Wall Street Journal*.
- Nogrady, B. (2021). Scientists under attack. *Natur*, 598, 250–253. <https://media.nature.com/original/magazine-assets/d41586-021-02741-x/19756934>
- Önnerfors, A. (2021). Conspiracy theories and COVID-19: The mechanisms behind a rapidly growing societal challenge. *The Swedish Civil Contingencies Agency*.
- Porter, E., & Wood, T. J. (2021). The global effectiveness of fact-checking: Evidence from simultaneous experiments in Argentina, Nigeria, South Africa, and the United Kingdom. *The Proceedings of the National Academy of Sciences*, 118(37).
- Propagandaschau. (n.d.). <https://www.psiram.com/de/index.php/Propagandaschau>
- Seytre, B. (2020). Perspective Piece Erroneous Communication Messages on COVID-19 in Africa. *The American Journal of Tropical Medicine and Hygiene*, 103(2).
- Sikorski, J. (2021). Infodemia jako czynnik społecznego zagrożenia. *Studia Wschodnioeuropejskie*, 15.
- The International Scheme of “Doctors for the Truth”: A Denialist Trademark Registered by Natalia Prego*. (2021, May 10). <https://chequeado.com/investigaciones/the-international-scheme-of-doctors-for-the-truth-a-denialist-trademark-registered-by-natalia-prego>
- Tracy, M. (2020, February 22). Inside the Wall Street Journal, Tensions Rise over ‘Sick Man’ China Headline. *The New York Times*.
- Yang, K.-Ch., Pierri, F., Hui, P.-M., Axelrod, D., Torres-Lugo, Ch., Bryden, J., & Menczer, F. (2021). The COVID-19 Infodemic: Twitter versus Facebook. *Biga Data & Society*, 1–6.