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THE ANALYSIS OF THE COVID-19 IMAGE EVOLUTION IN ENGLISH MASS MEDIA DISCOURSE

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Abstract: Starting from January 2020, the whole world and all the people's professional activities are affected by the COVID-19 pandemic. Since the beginning of the pandemic, the phenomenon of COVID has been analyzed from different perspectives. The present study aims to study the evolution of the COVID-19 image in the online mass media discourse on the example of the British Broadcasting Corporation (BBC) news portal. The research employs semantic network analysis to trace the changes in the description of the coronavirus-related articles presented online. Three samples of articles from the period from 2020 to 2022 are randomly collected and subjected to further analysis. As a result, the author concludes, that the image of the COVID pandemic has undergone a significant change from the distant public health-related phenomenon to one of the legal actors and social activities. The present study contributes to the analysis of the coronavirus pandemic domain in the online mass media discourse and diversifies the studies, employing the semantic network analysis approach.

Keywords: COVID-19, semantic network analysis, mass media discourse, VOSviewer software, discourse evolution.

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1. INTRODUCTION

According to the World Health Organization (WHO), COVID-19 is «the disease caused by a new coronavirus called SARS-CoV-2». It was first mentioned on 31 December, 2019, reported as a cluster of cases of “viral pneumonia” in Wuhan, People’s Republic of China [World Health Organization, 2019]. Since COVID-19 was first mentioned, it is an attractive research topic for scholars of different disciplines, including immunology, public health, medicine, language, and communication.

The representation of COVID-19 in mass media falls in the domain of public health media communication. Generally, health media communication aims to affect people’s behavior through

individual-level antecedents to the behavior of concern (such as knowledge, perceptions, and self-efficacy). Abrams and Maibach [2008] proposed a more profound framework to reach the target of public health media communication. Their framework includes people, the environment, and their interaction. It is traditionally believed that people in this case can be referred to at three levels: individual, social network, and community level.

Earlier, it was believed that newspapers possess great power to affect peoples' opinions and perceptions. For example, during World War I, they were thought to be able to shape public opinion easily [Lenart, 1994, p. 11]. Nowadays, the situation has changed, and modern mass media are not about "what to think", but "what to think about" [Cohen, 2000].

However, in the past decades, with the wide spread of the Internet, the information flow distribution has changed dramatically [Abrams & Maibach, 2008, pp. 77-78]. Modern online mass media possess a great number of tools to affect their readers. If traditional mass media operate with the basic tools, online mass media discourse has an opportunity to combine all of them at once. Thus, online mass media discourse includes photos or videos that can be used as a reference or proof of a certain phenomenon, numerous hyperlinks to other sources of information (e.g. *Twitter*), and text itself. The combination of all the above mentioned composites of online mass media discourse makes the latter extremely powerful, being able to reach the potential readers at all the three levels (individual, social network, and community levels).

The analysis of the pandemic representation in mass media and the impact it makes on people is not new. Prior to the COVID-19 pandemic the world population has gone through other dangerous diseases which were then analyzed. Thus, Gilman [2010] draws attention to the phenomenon of a pandemic and people's panic response to it. Influenza and measures on its control and prevention were analyzed by Miko and Miller [2010] and Smallman [2015]. Muzzatti [2005] assesses the representation of Severe Acute Respiratory Syndrome (SARS).

Nowadays, numerous research works are devoted to the analysis of people's reaction to the coronavirus related topics. Guntuku et al. [2021] assess *Twitter* discourse to trace citizens' concerns about COVID vaccination. Khan et al. [2022] refer to the analysis of the social media data to gauge the attitude towards COVID passports. Luo et al. [2021] compare the perception of the vaccination, using data from two social media platforms. Despite the thorough analysis of people's reactions, opinions, and perception of COVID-19 in social media, very little research refers to the cause of this reaction, namely the way COVID-19 is portrayed in mass media. For instance, Thirumaran [2021] assesses the portrayal of COVID-19 in New Zealand and Singapore newspapers. Katermina and Yachenko [2020] show that COVID-19 pandemic can be seen as a disruption of normal life, which finds reflection in the changes to English vocabulary.

The present study aims to analyze the evolution of the COVID-19 image in mass media. It is a well-known fact that mass media play a crucial role in the formation of public opinion on various important matters. Public perception of the situation, reaction, and further actions depend on the way an image of a certain phenomenon is presented.

2. MATERIALS AND METHODS

The present study aims to analyze the image of COVID-19 in the western mass media using samples from the BBC news portal. To trace the evolution of COVID-19, the study employs semantic network analysis (SNA). SNA employs computerized content analysis, which was first used in the 20th century [Quillian, 1968]. Since then, it has demonstrated itself as a useful tool for the clustering and representation of the knowledge [Helbig, 2006; Danowski, 1993; Doerfel & Barnett,

1999]. This approach provides an opportunity to graphically present the analyzed data by means of nodes and edges [Wassermann & Faust, 1994; Newman et al. 2006; Di Battista, 1999]. The present study adopts the semantic network analysis approach proposed by Drieger [2013]. The approach is advantageous as it does not only allow for linear text perception, but also employs networks of words which can be visualized and analyzed. With the help of SNA the significance of the word and word combinations can be identified in grouped clusters rather than in isolation [Featherstone et al., 2020b; Li et al., 2019; Smith & Parrott, 2012].

To perform the analysis *VOSviewer* software is employed. It provides an opportunity to create and visualize the map based on the network data. When creating the map, the program includes items that represent research interest (in case of the present study, these are semantic elements). The connection between the items is presented by the link that is characterized by the strength of the link between the items. The term “total link strength” is used to speak about “the number of publications in which two keywords occur together” [Guo et al., 2019]. It is generally considered that the more links there are between two items, the stronger the connection is. Items are grouped in clusters.

Within the research framework, three samples of data are randomly collected from the BBC news portal [www.bbc.com]. All of the articles belong to the same topic – “coronavirus pandemic”. The first sample dates to the beginning of the pandemic outbreak in 2020. The second sample is based on the articles published one year later, in 2021. The third sample is collected from the articles from January-February, 2022. Each sample includes ten articles. Then collated samples are grouped and prepared for the analysis.

Prior to the analysis, the texts of the articles underwent specific preparatory procedures. First, all the pictures and hyperlinks were removed from the articles and the text was converted to the plain text to be suitable for the analysis by the software. Second, according to the recommendations, all the stop words and punctuation marks were removed from the analyzed texts [Maier et al., 2018].

3. DATA ANALYSIS

To choose a threshold for the analysis, the minimum number of occurrences of a term is set to 3. The obtained map based on the analysis of the articles from the year 2020 is presented in Figure 1.

The created semantic network that reflects the content of the articles related to the COVID-19 pandemic consists of 85 items which form 13 clusters. There are 367 links in the network, with a total network strength of 693. The biggest Cluster 1, accounting for 15 words and word combinations, is mainly centered on the “China” topic with such words as “Chinese authority”, “Chinese government”, “national health commission”, and “COVID”. The second cluster with 12 words is obviously related to the situation in the neighboring countries and territories, such as Taiwan, Japan, South Korea, and the measures they implement. Cluster 3 accounts for 7 words and is related to the disease with such words as “SarS”, “genetic code”, “new virus”. Cluster 4 contains 7 words and concentrates on the local situation in China, mentioning cities such as Shanghai, Beijing, Wuhan, and Wuhan health commission. Cluster 5 consists of 6 words and is related to the scientific comprehension of the disease. There we can see the surnames of the scientists Guo and prof. Ferguson. Cluster 6 with 6 words follows the situation in China, mentioning major cities and the “new virus”. Cluster 7 with 7 words lists major COVID-19 symptoms. Cluster 8 consists of 6 words and concentrates on the way the disease is understood and explained by scientists, we can see such words as

“expert”, “source”. Cluster 9 combines words related to the protective measures taken against the disease. Cluster 10, related to the ways of transmission, contains 4 words. Clusters 11, 12, 13 with 4, 3 and 2 words, respectively, are related to the source of the outbreak. Table 1 shows the top 20 words based on their occurrence and total link strength.

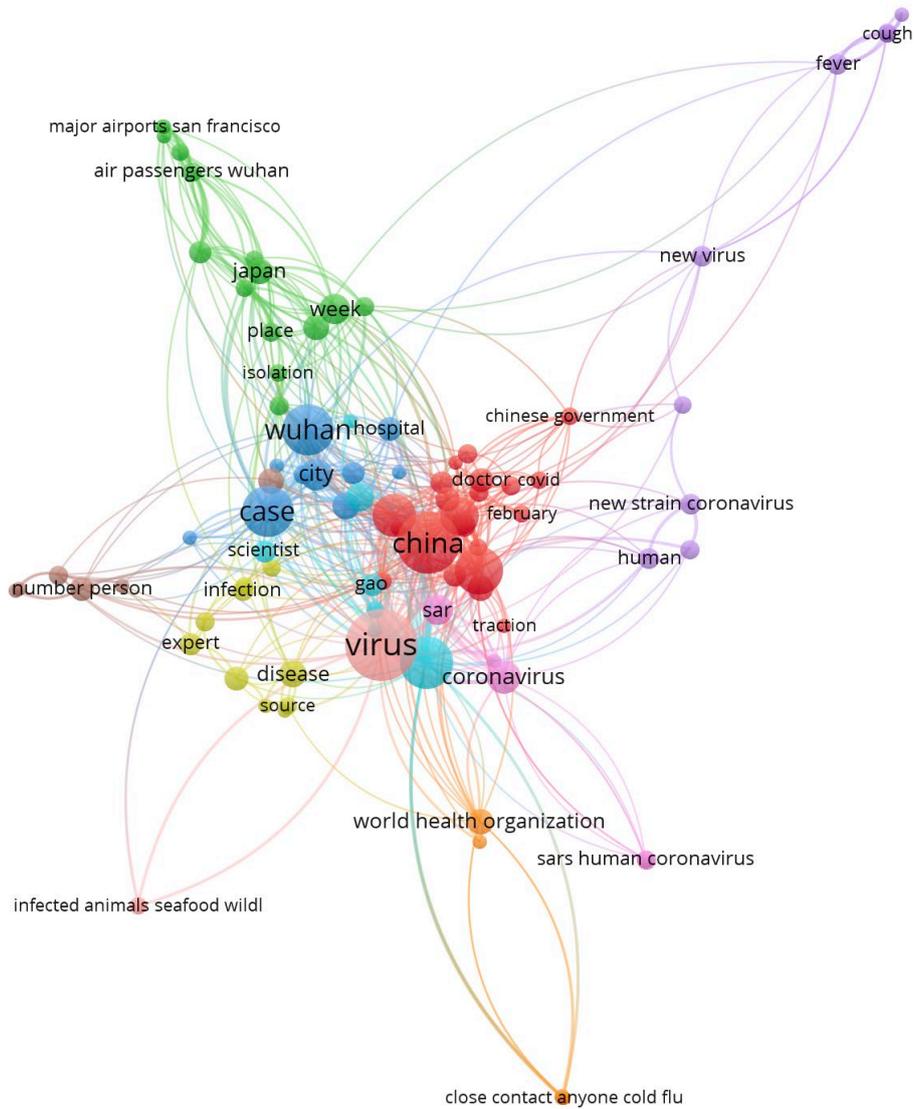


Figure 1. Semantic network 2020
(Source: created by the author in *VOSviewer*)

Table 1. Top 20 popular words and word combinations collected from the 2020 sample

Label	Cluster	Links	Total link strength	Occurrences
virus	12	41	104	64
china	3	38	91	49
wuhan	4	31	71	34
outbreak	1	31	66	30
case	4	24	62	33
january	1	23	39	24
country	3	18	38	18
coronavirus	3	16	36	15
beijing	4	15	29	10

Label	Cluster	Links	Total link strength	Occurrences
Sars	3	13	28	12
japan	2	10	26	9
hong kong	2	14	25	7
air passengers wuhan	2	9	23	5
official	1	12	20	8
number person	6	10	19	8
world health organization	9	14	18	9
authority	2	12	18	9
fever	7	7	18	6
los angeles new york	2	8	18	4
human-human transmission	5	11	16	11

Source: Summarized by the author using VOSviewer.

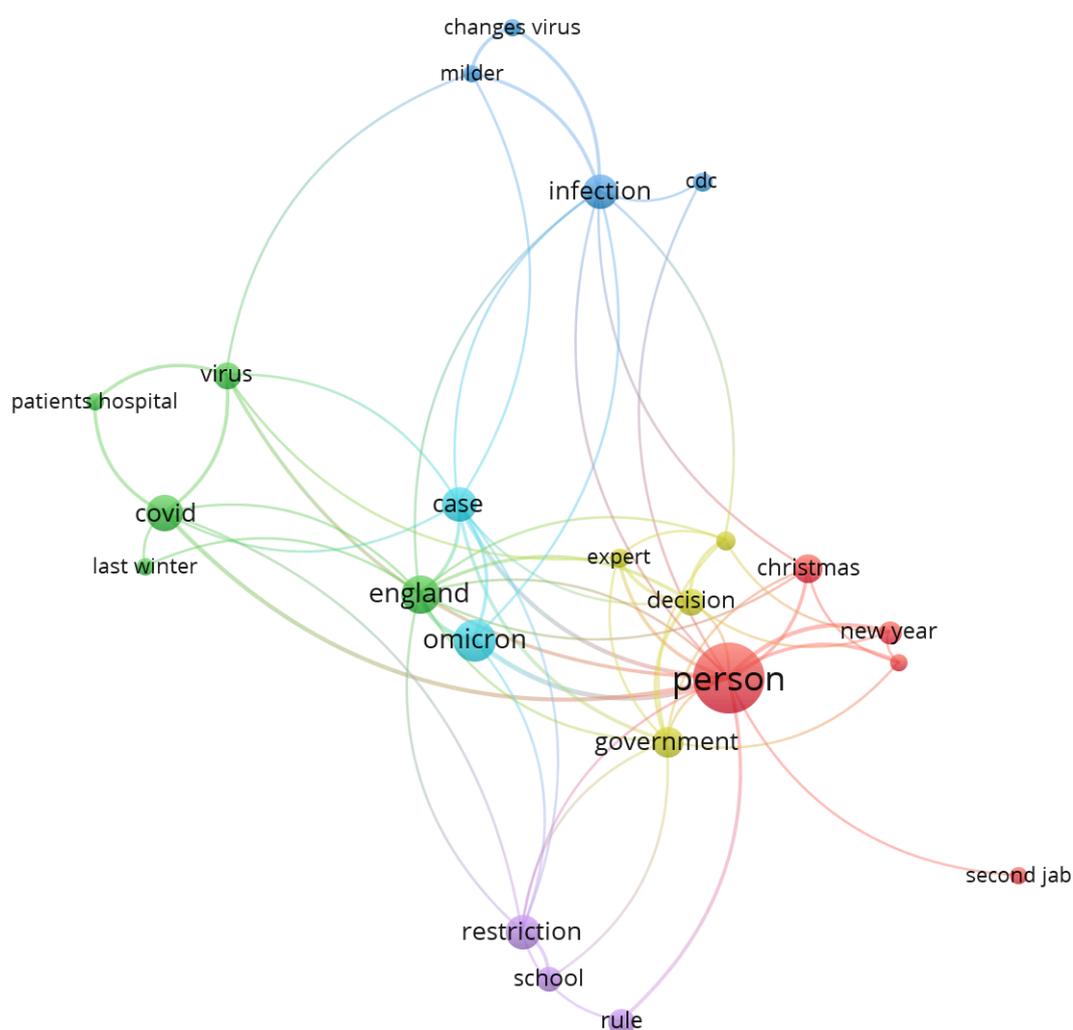


Figure 2. Semantic network sample 2021
 (Source: created by the author using VOSviewer)

As it can be seen from the table above, the news flow was mainly concentrated on the Asian countries, covering virus-related topics, such as symptoms and ways of transmission. Words “China” and “Wuhan” occur 49 and 34 times, respectively.

Next, the sample collected from articles in 2021 on the BBC news portal is assessed. The same parameters were applied for the analysis. As a result, a network with 24 items was obtained. There are 7 clusters with 65 links, and the total link strength accounts for 95. The obtained semantic network is presented in Figure 2.

The first cluster of the second sample consists of 5 words and is obviously related to the holidays in the UK, mentioning Christmas and New year. The second cluster with 5 words as well is related to the COVID-situation in the UK, mentioning the name of the country, hospitals, and the virus. Cluster 3 with 4 words is related to the changes happening to the virus and mentions milder symptoms. Clusters 4 and 5, with 4 and 3 words, are related to the anti-COVID measures, mentioning restrictions and rules. Clusters 6 and 7, with 2 and 1 words, are related to the virus in general. Table 2 demonstrates the list of words, based on their occurrence, and link strength.

Table 2. Top 20 popular words and word combinations collected from the 2021 sample

Label	Cluster	Links	Total link strength	Occurrences
person	1	16	30	48
omicron	6	5	11	18
england	2	11	15	15
covid	2	7	11	13
infection	3	9	11	12
restriction	5	8	9	12
case	6	10	15	12
government	4	10	12	10
christmas	1	5	6	8
virus	2	6	9	7
decision	4	7	11	7
rule	5	2	3	7
school	5	2	3	6
new year	1	4	6	5
expert	4	5	7	4
measure	4	6	7	4
ms keegan	1	4	5	3
second jab	1	1	1	3
last winter	2	2	2	3
patients hospital	2	2	4	3
changes virus	3	2	4	3
milder	3	4	6	3
vaccines booster	7	0	0	3

Source: Summarized by the author using *VOSviewer*.

As shown in Table 2, the situation has changed dramatically over a year. If in 2020 the most popular words had Chinese-related thematics, in 2021, the news is covering the local situation. It is obvious that the idea of rules and restrictions became more relevant. The information about the symptoms of the disease disappeared, while in 2020, it was one of the important topics. We do not see the word “outbreak”. However, the mass media are informing us about the change of the virus and milder symptoms, which makes readers believe COVID is not dangerous anymore.

Figure 3 represents the semantic network that was created based on the sample of the articles collected in the first two months of 2022. The network consists of 41 items grouped in seven clusters. There are 144 links observed, with the total link strength accounting to 198.

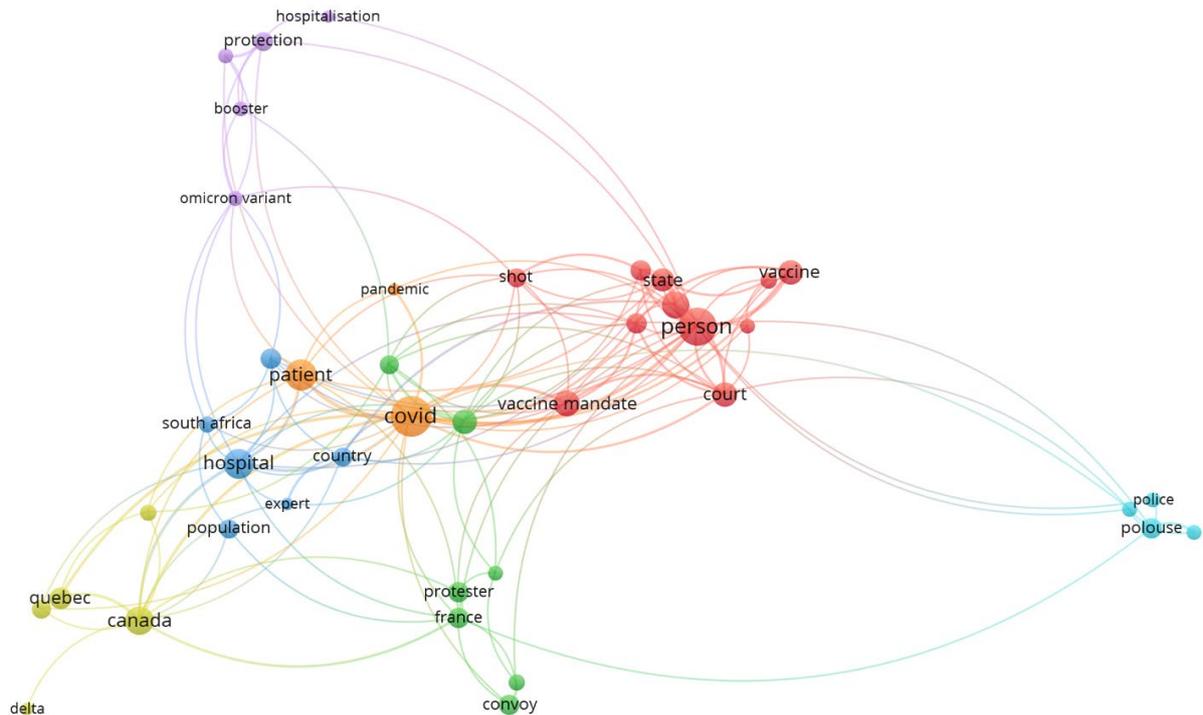


Figure 3. Semantic network sample 2021
 (Source: created by the author using VOSviewer)

The first cluster of the network, which consists of 11 words, combines the words related to the governmental COVID prevention and control measures. There such words as “court”, “decision”, “rule”, and “vaccine mandate” can be seen. The second cluster with 7 words is related to the description of public reaction to the measures imposed by the government. Such words as “demonstrator”, “convoy”, and “protestor” are common. The third cluster is linked to the Omicron type of the virus. The cluster accounts for 6 words. The fourth cluster is related to the Delta variant of the coronavirus disease, with 5 words in the cluster. Five words in cluster five are linked to the Omicron variant of the coronavirus disease, with such words as “omicron variant”, “severe disease”, and “hospitalization”. The sixth cluster represents some governmental measures or reactions. It includes such words as “police” and “law”. The seventh cluster mentions “covid”, “pandemic”, and “patients”. The summary of the top 20 words in the sample are presented in Table 3.

Table 3. Top 20 popular words and word combinations collected from the 2022 sample

Label	Cluster	Links	Total link strength	Occurrences
covid	7	25	45	28
person	1	21	32	24
patient	7	11	17	16
hospital	3	13	19	15
rule	1	7	15	13
vaccine mandate	1	8	12	11
court	1	12	18	10
vaccine	1	6	12	10
mandate	2	11	12	10
state	1	9	12	9
convoy	2	3	4	7

Label	Cluster	Links	Total link strength	Occurrences
convoy	2	3	4	7
protester	2	4	4	7
omicron	3	8	8	7
shot	1	10	11	6
administration	2	9	10	6
population	3	3	3	6
case	4	4	4	6
protection	5	6	8	6
mask	1	5	6	5
demonstrator	2	4	5	5

Source: Summarized by the author using *VOSviewer*.

As it can be seen from Table 3, the domain of the COVID-related information has changed its direction greatly since 2020 and even 2021. The word “COVID” still remains in top 5 words in terms of occurrence and total link strength. However, more attention is concentrated on the governmental control, prevention measures and people’s reaction to these measures. Such words as “protester” and “demonstrator” prove this observation. We can also see governmental response to peoples’ reaction. Such words as “rule”, “court”, “police”, “convoy” signify the seriousness of the governmental response.

4. DISCUSSION AND CONCLUSION

The present study adheres to the idea presented by Nordlund [2003] that “language is not value-free”. The words people use in their daily life as well as those used by mass media are linked with some particular concepts. The way we perceive the information from mass media is consciously or subconsciously affected by those concepts. Thus, according to Beard [2008], language is not only a means of communication but also a reflection of the ideas it expresses. The usage of the language is determined by the idea it delivers. As it has been mentioned earlier, a lot of research is conducted concerning people’s responses to COVID-19. However, the role of mass media in this response is ignored. Therefore, it is essential to analyze the cause in the first place.

The present study aimed to assess the evolution of the COVID image representation in the British mass media from the beginning of the pandemic in January 2020 to the present, February 2022. Semantic network analysis has been employed to perform the assessment.

Within the course of the research, it has been found that the image of the COVID pandemic has changed greatly over the past two years. At the beginning of the pandemic the British press clearly draws a picture of the virus which breaks out far away from the United Kingdom. Mostly Asian countries are mentioned, which helps to distance the phenomenon from the local UK readers. In the first year of the pandemic, attention is paid to the symptoms of the disease, reflected in cluster 7 of the analyzed 2020 sample. However, in the articles of 2020 sample, the words related to the danger of the virus as well as to the protective measures taken, are not so frequent. All the words with high occurrence and total link strength in the articles analyzed are neutral. No word «death», or words describing the danger of the phenomenon appears in the sample. Meanwhile, according to the statistics 2488780 people in the UK got infected and 73512 deaths were registered by the end of 2020.

Later, in the articles from the years 2021 and 2022 the information about the symptoms of the disease becomes less ubiquitous. Starting from 2021 the words “vaccine” and “vaccination mandate” start to appear in the semantic networks, unlike in the sample of 2020. Moreover, a lot of attention both in 2021 and at the beginning of 2022 is concentrated on the governmental anti-COVID

measures implemented in different countries. People's reaction to the situation plays an important role in the coronavirus image representation in the online mass media discourse. The high occurrence of such words as “restrictions”, “rule”, “measure”, “government”, “demonstrators”, “protesters”, “court”, “police” demonstrates a clear shift of the COVID image from the public health domain to the domain of legal actors and social activities.

Overall, the study contributes to the analysis of the COVID-19 image in online mass media discourse. The study can be further extended by addressing the specific concepts within the coronavirus domain, and such concepts as governmental measures, prevention and control activities and vaccination can be analyzed. Further, a comparative study can be performed for the mass media of different countries.

Conflict of interest

The author declares there is no conflict of interest.

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