

National interest Through News Lens: A Computer-Based Textual Analysis of COVID-19 Vaccine Coverage in China, United Kingdom, and the USA

AFTAB HOSSAIN*

Daffodil International University, Bangladesh

JULIANA ABDUL WAHAB

Universiti Sains Malaysia

MD. SAIDUR RAHMAN KHAN

MUSABBIR HASAN SAMMAK

Daffodil International University, Bangladesh

JANNATUL BAKIA SWEETY

Universiti Sains Malaysia

ABSTRACT

This research is a comparative text analysis on the news of Covid-19 pandemic vaccine invention updates in China Daily, The Guardian, and USA Today. The relevant countries of the origin of these media outlets (China, UK and the USA) were in the race of vaccine solutions for the Covid-19. To find out how they represented their country's updates in comparison to other countries, the study was initiated. Only the text-based news from 1st May to 31st May 2020 was collected from the respective newspapers. The computer-based text analysis using MAXQDA software was used to perform the study based on the theoretical framework of framing. The study found how the news is presented by such globally known national dailies. By analysing their news texts; using word frequencies, word cluster combinations, and semantic associations between the news published during the selected time. A total 105 text-based news from the print edition of the newspapers were listed and 84,295 words were analysed to determine how the Covid-19 vaccine updates were presented by the highest circulated national daily newspapers in China, the UK, and the USA. After the textual analysis, six individual frames were found, and the result indicated three similar frames and three different frames. The similarities and differences such as framing each other's vaccine outcomes, public health issues and the positive updates of their respective country's vaccines were addressed from the base of different framing frameworks. Additionally, the coverage of local and foreign news from the individual newspapers was also taken. It has also addressed the geopolitical and socio-economic factors behind the frames.

Keywords: *Communication studies, mass communication, journalism, media framing, computer-mediated data analysis.*

INTRODUCTION

Since the global pandemic Covid-19 (Sars-Cov-2) first identified in Wuhan, China in December 2019, the Covid-19 started to spread internationally in January 2020 (Liu et al., 2020; Xiang et al., 2020). After the worldwide pandemic breakout, governments of different countries tried to

reduce the viral infection with strict movement control or lockdown and with other strategies. Covid-19 is having a great impact on society, nature, economy, and governance (Qiu et al., 2020; Samuelsson et al., 2020).

According to Business Insider (2020), the most affected business sectors like food, traveling and tourism are facing its decline globally. People from dynamic work backgrounds are suffering from lower-wage payments and job insecurity (Adams-Prassl et al., 2020) while the Binder (2020) thinks that the economic encounter due to Covid-19 is creating a certain fear in the macroeconomics. In this situation, Gates (2020), claimed that there are two possible solutions to overcome this issue; one is to let this situation continue and another is to develop a vaccine at record speed.

The vaccine of Covid-19 is the possible solution to overcome the socio-economic challenges seen by the experts (Gates, 2020; Lurie et al., 2020); while the vaccine race is on since the beginning of the year 2020. According to the World Health Organization (WHO) report, the leading vaccine research organizations are; University of Oxford/AstraZeneca from the UK, CanSino Biological Inc. /Beijing Institute of Biotechnology from China and Moderna/NIAID from the USA (WHO, 2020). As these organizations are in the race of vaccine invention, the media of the country of origin (China, UK, and the USA) of these organizations cannot be overlooked in the current situation.

As the media plays the role of the fourth state (Schultz, 1998; Wheeler, 1999), it is always important how the media is representing current affairs. The international media role in framing the vaccine issues becomes inevitable now. National dailies like China Daily, The Guardian and The USA Today are highly followed news sources in China, the United Kingdom, and the United States of America.

Lewis (2020) mentioned, during the pandemic, the 'disinformation' and 'fake news' rose and local news authorities are dependent on the national news organizations to know the truth. These highly recognized print-based newspapers maintain their online versions with high accuracy and efficiency to determine the news validity. Their online versions, they have been updating their online versions on a regular note. This study focuses the Covid-19 vaccine-related news coverage of these renowned newspapers. The primary observation of these news organizations shows that they are covering the concurrent issues on the Covid-19 and the updates of the vaccine, but indirectly they are framing their own planned agenda by portraying their coverage area and topic angles, as mentioned by Boyle and Mower (2018).

However, the global media coverage and illustration of this lethal disease and transmission is different in the regional context, but China, UK, and the USA are leading the race of finding the prevention of this. Therefore, this study compares the highest published and most reputed Chinese English language-based newspaper – 'China Daily', one of the highest circulated and trustworthy British newspaper 'The Guardian' and most circulated and well believed US-based newspaper 'USA Today' framing this issue through their news.

In many aspects, these newspapers are the most accepted brands in the news platform in their national context. China Daily has been serving since 1981 and the global English version since 1993 with daily 900,000 circulation is the highest in China. The Guardian is in the business for a century since 1921 with its enormous reputation (Wolf & Jenkins, 2018) and the healthy

number of circulations with daily average 3,021,000 printed copies (Guardian, 2020) and online platform 23,466,000 (USA Today, 2020). The orientation and closeness of China Daily, The Guardian, and USA Today is an important fact that is being notified. According to the geopolitical prospect, China, the United Kingdom, and the United States have different perspectives in the latest international politics (Dincecco & Wang, 2018; Guariglia & Mateut, 2016). All these three newspapers have online platforms as additional sources to their print versions for the global audience.

Also, the researchers investigated based on textual statistical data on how news about the COVID-19 vaccination contest is framed in national newspapers in China (China Daily), the UK (The Guardian), and the USA (USA Today). The study specifically examines how these newspapers present their country's advancement in relation to other nations, public health issues arising from the quick development of vaccines, and the advantages of their country's vaccination initiatives (Dongke et al., 2022). Additionally, the study investigates how these media outlets impact public perceptions of the global vaccine race and its national repercussions by looking at framing patterns through a text analysis.

Framing Theory

This research seeks to discover and comprehend how the most widely distributed national dailies, such as China Daily, The Guardian, and USA Today, construct their content. Framing Theory examines how specific events and situations are depicted and explained in the media and news. It also facilitates the construction of news to represent social realities (Wu & Xiao, 2020). The concept of "news frames" was identified by Goffman (1977) as the manner in which the media organizes events. Araújo and Prior (2020) also stated that the media can influence the public and their behaviour towards political events and their attachments by imposing interpretive frameworks.

Media framing is a crucial component in creating meaning while developing media products (Choi, 2018). According to Entman (1993), media professionals structure occurrences or in-action reporting to highlight differences in their quality or levels. These media pieces influence our impression of the environment to varying degrees, thereby contributing to misunderstandings through unbalanced or biased reporting (Saleem, 2007). In their Propaganda Model, Herman and Chomsky (2012) show how cultural, economic, religious, and political forces hinder media workers. The journalistic values of objectivity, neutrality, and honesty are theoretically attainable but appear impractical in practice. When expressing significance in a text, media environment activities also play a role. This combination influences the conveyance of a tale to an audience and the manner in which it shapes reality (Estupinan, 2017).

The concept of 'Framing Theory' is related to 'Agenda Setting Theory' The local news sources obtain their information from national newspapers and television networks, and the frameworks and objectives of these news organizations are reflected in the local news sources (Li, 2018). The primary tenet of framing theory is that the media emphasizes particular occurrences and places them in a major context when reporting on them (University of Twente, 2004). The media selects certain significant themes that garner public interest and influence the audience's thinking in accordance with the media's intentions. It primarily occurs in concurrent social circumstances (Araújo & Prior, 2020). The proprietors of news organizations that choose

the "Agenda Setting" concur on this plan, allowing them to determine the strategic framework. But when journalists implement this agenda shaping (via reporting, editing, and positioning), it is referred to as "Gatekeeping Theory" (Shoemaker & Riccio, 2016). Instead, journalists construct news perspectives that suit the whole picture. This particular news section is actively implemented by the journalists involved. These frames constitute the abstract concept that generates news and organizes its social relevance. Images influence the public's perspective in such a way that people not only discuss this topic, but also how to discuss it in order to implement agenda-setting in practice (Bunea, 2020).

When communicating and analysing information, frame analysis is one of the most important techniques. The conceptual frame, which refers to the integral portion applied to structural elements and transmitting certain perception patterns (Gamson & Modigliani, 1989), provides a framework for understanding how particular portrayals are built and subsequently reveal their fundamental meanings. This goes beyond the notion of positive or negative, pessimistic or hopeful, and emphasizes the role of the news media in identifying difficulties, diagnosing triggers, making moral judgements, and proposing remedies (Entman, 2004, p. 5). Then, frame analysis can reveal the underlying political orientations and hidden assumptions of news content that are not addressed by standard bias analysis (Hackett, 1984).

According to Semetko and Valkenburg (2000), there are five general frame categories. We are categorized as conflict, human interest, economic repercussions, morality, and responsibility. Frame sponsors have a crucial influence in all phases of frame design. These frameworks were simplified by Kanaker et al. (2020) into conflict, human effects, economics, morality, and framing responsibility. In addition, they highlighted how news sponsors play a crucial role in framing. From the news source to the reporter and editor, each plays a significant role in the framing of an issue (Kee et al., 2012). The arguments were presented by Stromback et al. (2008), who brought up the sociopolitical considerations for the framing. To present a viewpoint, news sponsors might alter the angle or slant of the news. The importance of political, social, and economic factors in shaping the news cannot be overstated. Occasionally, the media disregards or disregards issues, sources, and stakeholders for the aforementioned reasons (Cavaca et al., 2016)

Currently, news is more about telling stories than just reporting the facts to readers and audiences (Gamson, 2015). During the narration, the difficulties may appear in frames as both have a correlation (Cormick, 2019). Framing is the method through which journalists explain an event or specialized topic such that the news informs the reader's interpretation (Afzal & Harun, 2020). Additionally, framing is responsible for the messages of news producers, their interpretation of how the media frames the content, and how viewers interpret the message and content (Mason, 2019). The principles of gatekeeping and establishing the agenda are intimately connected to the concept of framing. These ideas relate the framing principle to salience during news selection and publication (Chong & Druckman, 2007; de Vreese, 2005).

This study demonstrates how China Daily, The Guardian, and USA Today frame their stories by revealing what millions of readers of their online and print editions are reading. Consequently, if readers follow their printed or online versions, they will encounter the news that these news companies have framed. This news has the influence to draw the attention of governments and authorities to social, political, and economic problems. In order to comprehend

how national daily's (China Daily, The Guardian, and USA Today) develop their narratives about the COVID-19 vaccination race. A framework for examining how the media presents and interprets events, influencing public opinion, is offered by framing theory. In this study, we looked into how these media outlets focused their news coverage on nationalism linked to vaccines, public health awareness, and how they were disparaging the advancement of vaccines in other nations.

There are two fundamental ways to study framing theory. They are the inductive and deductive approaches (Semetko & Valkenburg, 2000). The inductive method seeks to find all conceivable frames; beginning with larger frame assumptions, it then attempts to classify the frames into sub-frame classes (Gamson, 1992; Semetko & Valkenburg, 2000). The deductive method begins with more explicit hypotheses; it pre-defines specific frames and examines how they emerge in the news (Semetko & Valkenburg, 2000). This study utilized the inductive methodology to enhance test objectivity. Through an inductive approach and a concentration on these particular framing elements, this study attempts to provide a thorough grasp of how national newspapers create stories about the COVID-19 vaccination race. In this study, the analysis doesn't assume any frames ahead of time. Instead, it lets the data (word frequency and word clusters) suggest a possible frame after the data has been collected.

Computer – Based Text Analysis

The analysis of the text is based on the guidance of (Bauer & Gaskell, 2011; Hossain et al., 2022). That refers to the analysis of text from the news content documents. Generally, the Content Analysis deals with written textual material but similar approaches may be applied to images or sounds. There are two types of texts: texts produced during the research procedure, such as interview transcripts and observation processes; and texts already created for another reason, such as newspapers or corporate records. The classical materials of Content Analysis are written texts that have already been used for another purpose. Nonetheless, all those texts can be monitored to respond to the study's questions.

The study of the computer-assisted text is based on the notion of an interpretation of the text. Popping (2000) defined text analysis as 'a research technique for making replicable and valid inferences from text to their context.' Under that same definition, computer-assisted text analysis can be viewed as the software-based research technique; with the computer's essential involvement in replicable and valid from the transcript to the study context (Tian & Stewart, 2005).

Computer-assisted Qualitative Data Analysis Application (CAQDAS) is also known as Content Analysis Software (CAS) to do textual and visual document content analysis (Hamborg et al., 2019). This software helps to review the findings from images, videos, and text formats to reduce a large amount of data review. This software also helps the coders in most cases, to find the word frequency and the list of combined words in the document (Hamborg et al., 2019). The word frequency and cluster items were individually identified from the texts of China Daily, The Guardian, and USA Today in this report.

Computer-based text analysis can be taken as 'more objective' than manual text analysis (Tian & Stewart, 2005). The data analysis of the news from various media did not need to be pre-read with the assistance of the MAXQDA software as well as the researchers did not need to have

pre-specification of data categories, pre-conceptions of ideas and consciously or unknowingly placed presuppositions (Kuckartz & Rädiker, 2019).

Computer-based text analysis is more reliable because of its automatic fixed algorithm. Analyzing data is a very efficient operation, large amounts of data is complicated and time-consuming for any researcher but it can be achieved in minutes using a program (Cypress, 2019). This type of analysis is also useful for framing analysis. Thematic Analysis of the subject text is an assumption that the text produced is intended by the creator of the text through the frequency of the use of the themes in the document.

There are two general types when analyzing content. The conceptual approach, and the relational approach (Chan et al., 2016). The conceptual approach is also known as thematic approach identifies the data and analyzes it by quantifying the numbers and counting where the relational approach is almost identical but goes deep into the sum of the data. Here it focuses on the qualitative analysis of the relationship between words and the semantic and meaningful relationships between words. When no connection occurs between the 'cluster words' then the words are purposely avoided (Busch et al., 1997). The computer-based text analysis is a method of research that has been extended to any area of study that especially studies the area of journalism (Franzosi, 1995). In recent studies, computer-based framing analysis has been effective in evaluating the framing analysis, so this study aims to find out the framing analysis of China Daily, The Guardian, and USA Today using the computer-based content analysis approaches (see: Czibik, Pápay, Szántó, & Toth, 2016; Franzosi, 1995; Greussing & Boomgaarden, 2017; Young, Hermida, & Fulda, 2018).

From the very beginning of the outbreak of Covid-19 pandemic, China was identified as the source of this where the UK and the USA were the countries where victims of this were at the top. Additionally, the aforementioned countries were the first three countries who declared their works on vaccines. Such as China's Sinovac, UK's Oxford–AstraZeneca and USA's Comirnaty by Pfizer-Bio-N-Tech.

Since the purpose of this study is to find out how China Daily, The Guardian, and USA Today frame the SARS Cov-2 vaccine, known as the Covid-19 vaccine invention race, the text analysis is the best possible approach for analysing news content. This study is based on an analysis of the computer-assisted text. The research focuses on the texts contained in the text-based news items from the printed version or e-paper on Covid-19 vaccine news and compares framing produced by China Daily, The Guardian, and USA Today according to the advantages of the inductive approach of textual analysis listed above. The study's research questions are:

RQ1: How did China Daily, The Guardian, and USA Today frame the crisis of Covid-19 on their Facebook page textual news sharing?

RQ2: Are there any similarities and differences between their framing?

METHODOLOGY

Analysis of content is known as the systematic approach of reviewing and categorizing written texts (Chuang et al., 2015). This is one of the commonly recognized basic approaches to research in the humanities and social sciences. Analyzing data using a computer is not a new technique. The advantages of machine analyzing data are word frequency measuring, finding similar words,

and a word combination to assess output. After that, a researcher will have the liberty that can lead to getting the results.

In this section, the sample, data collection, and data processing process is being described. Also, we will explain how the data has been collected from the Newspapers. Then the procedure of data analysis is also clarified here. The researchers have developed the method of using both the conceptual and the relational approach of content analysis (Busch et al., 1997) to analyze the news from these news organizations. The frequency detection of the words represents the conceptual approach (Table: 1) and the word clusters represent the relational approach (Table: 2) of the content analysis (Carley, 1990).

Samples

The sample collection was automated by using 'Python' and 'BeautifulSoup'. Python (Rossum & Drake, 2006) is a general-purpose programming language, whereas BeautifulSoup (Zheng et al., 2015) is a vertical information search technology based on DOM tree structure. BeautifulSoup can retrieve information from both structured and partially structured web pages with over 95% accuracy (Zheng et al., 2015). Webpages of our selected newspapers were highly structured. Therefore, DOM tree-based information retrieval was chosen instead of other statistics or machine learning-based retrieval.

The samples have been tracked from the online edition of China Daily, The Guardian, and USA Today web pages. The news from the respective global newspapers has been monitored, downloaded, and documented with Covid-19/COVID-19/SARS Cov2's keyword linked to 'Vaccines.' The dates were chosen from 1 May to 31 May 2020, when the medicine researchers announced the advancement of the vaccine. China-Based medicine organization 'Sinovac Research and Development Co., Ltd.' was completing their 'Phase 2' of vaccine 'Covid-19Vac'trials' (candidate name: 'Adeno Type 5 Vector') (Sinovac Biotech, 2020). The University of Oxford's Jenner Institute (School of Medicine) from the United Kingdom also completed 'Phase 2' and decided for larger-scale human trials on 'Phase 3' with their vaccine 'AZD1222' (candidate name: 'ChAdOx1-S') (Oxford Vaccine Group, 2020). On the other hand, the United States-based 'Moderna' sponsored by 'Kaiser Permanente Washington Health Research Institute' was also getting positive feedback with their vaccine candidate 'mRNA-1273' (candidate name: as LNP-encapsulated mRNAafter) their 'Phase 2' of human trials with a small-scale participant who took the vaccine voluntarily (Moderna, 2020). The reports were downloaded at this time due to the reasons. The news links were cross-checked again and none of the links were found dead and inactive. Total 105 reports were published from May 1 to May 31, 2020, in China Daily (33 News), The Guardian (33 news), and USA Today (39 news) print version or global version e-newspaper. A total number of 84295 words (China Daily 14781 words, The Guardian 27907 words and USA Today 41607 words) were selected as sample text from 105 news items.

Computer-Based Data Analysis

MAXQDA is a software for analyzing computer-based qualitative data and mixing methods including text and audiovisual data (Chandra et al., 2019; Marjaei et al., 2019). With this program, data from China Daily, The Guardian, and USA Today were analyzed. MAXQDA can show the word frequencies like conventional software as a neutral machine-based program, but it has also

discovered the semantic relationships between textual concepts through the clustering phase of the themes based on texts imported into the program (Kuckartz & Rädiker, 2019). The software can classify the word frequencies and the words most frequently used as word combinations in text analysis.

Operation

MAXQDA program has a system that can deduce meaningless terms like prepositions and 'stop list' verbs. It can change the 'stop list' by adding new words. A final 'stop list' has been finalized for the researchers to develop the study. To exclude from the main file, the name of the days such as 'Sunday' and 'according to' was also added to the stop list. It made the study more concentrated and the researchers could be more interested in focusing on the relevant concepts. To boost the authenticity of the study several terms have been modified in China Daily, The Guardian, and USA Today's initial text files due to their similarity (Tian & Stewart, 2005). Such as:

- *Covid-19, Covid, COVID, Covid-19, , and SARS-CoV-2* were replaced by *Covid-19* as the disease is known as all these names;
- *Inoculation vaccinated, vaccination, vaccinations* were replaced by *Vaccine*, the *public* was replaced by *people*
- *U.S US, United State, United States of America and America* were replaced by the *USA*, *United Kingdom* was replaced by the *UK*, *United Nations* and *UN* were replaced by *UnitedNations* and *World Health Organization* and *WHO* were replaced by *WHORG*, as the word *WHO* and 'who' could be mixed up as the same word. The word 'who' was added to the stop list in the MAXQDA software. *US* was replaced with the *USA* manually because the computer application Microsoft Word may have a mix-up with the 'US' and 'us'. Also while replacing *America* with the *USA* was done manually.
- Terms like the *United Arab Emirates (UAE), Hong Kong (HK)* were also searched but the number of results found was very low.

The program was directed to find the top used words to make a list of word frequency, from where the next instruction was to select the top 30 words from the texts with the highest frequency. The top 30 terms were chosen because the smaller number was 30 and the more delectable choice was 100. For a better understanding, the researchers selected the top 30 terms (Table: 1) as the correct number. Later, the software was asked to locate the 'cluster words' from the three separate text files.

FINDINGS

The MAXQDA showed the most frequently used words in word frequency analysis in individual text files while cluster terms were also listed from the data of China Daily, The Guardian, and USA Today's text lists. The study results are divided into similarities and the differences, which were the most highlighted in the newspapers. The approach and purpose of these news framing and coverage are discussed below and shown in Table 1 (Top 50 word frequency list) and Table 2 (Top 50-word cluster list):

Table 1: List of word frequency (China Daily, The Guardian and USA Today)

SL.	China Daily Word Frequency			Guardian Word Frequency			USA Today Word Frequency		
	Word	Frequency	%	Word	Frequency	%	Word	Frequency	%
1	vaccine	317	4.46	vaccine	396	3.08	vaccine	416	2.17
2	Covid-19	239	3.36	Covid-19	320	2.49	Covid-19	407	2.12
3	china	93	1.31	people	118	0.92	health	146	0.76
4	usa	93	1.31	usa	114	0.89	people	120	0.63
5	people	76	1.07	global	74	0.58	trump	92	0.48
6	trials	59	0.83	health	57	0.44	testing	77	0.40
7	health	50	0.70	pandemic	57	0.44	disease	72	0.38
8	research	49	0.69	trials	54	0.42	work	72	0.38
9	development	46	0.65	world	50	0.39	public	70	0.37
10	global	40	0.56	research	48	0.37	usa	66	0.34
11	world	40	0.56	trump	46	0.36	home	64	0.33
12	clinical	39	0.55	uk	42	0.33	president	61	0.32
13	pandemic	39	0.55	whorg	39	0.30	trials	60	0.31
14	trump	34	0.48	china	35	0.27	pandemic	56	0.29
15	phase	33	0.46	scientists	34	0.26	americans	54	0.28
16	whorg	32	0.45	work	34	0.26		53	0.28
17	developed	28	0.39	development	33	0.26	state	52	0.27
18	government	28	0.39	government	32	0.25	clinical	51	0.27
19	human	28	0.39	cases	30	0.23	news	49	0.26
20	national	28	0.39	companies	29	0.23	government	48	0.25
21	canada	27	0.38	infection	29	0.23	dr	46	0.24
22	candidates	25	0.35	state	29	0.23	school	46	0.24
23	chinese	23	0.32	effective	27	0.21	house	45	0.23
24	international	23	0.32	challenge	26	0.20	national	45	0.23
25	medical	23	0.32	oxford	26	0.20	phase	45	0.23
26	president	21	0.30	national	24	0.19	safe	44	0.23
27	data	19	0.27	president	24	0.19	world	44	0.23
28	response	19	0.27	risk	24	0.19	speed	43	0.22
29	antibodies	18	0.25	european	23	0.18	tests	42	0.22
30	candidate	18	0.25	lockdown	23	0.18	cases	41	0.21

Table: 2 List of word combinations (China Daily, The Guardian and USA Today)

SL.	China Daily Word Combinations			Guardian Word Combinations			USA Today Word Combinations		
	Word combination	Frequency	%	Word combination	Frequency	%	Word combination	Frequency	%
1	Covid-19 vaccine	48	1.28	Covid-19 vaccine	42	0.65	Covid-19 vaccine	60	0.60
2	clinical trials	26	0.70	clinical trials	16	0.25	public health	39	0.39
3	vaccine candidates	16	0.43	challenge trials	15	0.23	clinical trials	30	0.30
4	ad5 ncov	11	0.29	infectious Covid-19	14	0.22	warp speed	30	0.30
5	people health	10	0.27	prime minister	13	0.20	white house	30	0.30
6	vaccine candidate	10	0.27	white house	13	0.20	social distancing	28	0.28
7	vaccine development	10	0.27	Covid-19 pandemic	12	0.19	operation warp	26	0.26
8	cansino biologics	9	0.24	Covid-19 cases	10	0.15	president donald	25	0.25
9	oxford vaccine	9	0.24	donald trump	10	0.15	donald trump	24	0.24
10	Covid-19 pandemic	8	0.21	vaccine development	10	0.15	johns hopkins	23	0.23
11	human trials	8	0.21	conspiracy theories	9	0.14	operation warp speed	23	0.23
12	USA government	8	0.21	pharmaceutical companies	9	0.14	president donald trump	22	0.22
13	flu vaccine	7	0.19	death toll	8	0.12	contact tracing	20	0.20
14	global people	7	0.19	european commission	8	0.12	Covid-19 pandemic	20	0.20
15	human clinical	7	0.19	long term	8	0.12	candidate vaccine	18	0.18
16	human clinical trials	7	0.19	people health	8	0.12	drug administration	16	0.16
17	national research	7	0.19	social distancing	8	0.12	human services	16	0.16
18	national research council	7	0.19	south korea	8	0.12	task force	16	0.16
19	phase ii	7	0.19	world leaders	8	0.12	infectious disease	14	0.14
20	potential vaccine	7	0.19	boris johnson	7	0.11	vaccine candidates	14	0.14
21	research council	7	0.19	candidate vaccine	7	0.11	disease control	13	0.13
22	candidate vaccine	6	0.16	global health	7	0.11	infectious diseases	13	0.13

23	confirmed cases	6	0.16	human challenge	7	0.11	los angeles	13	0.13
24	director general	6	0.16	human challenge trials	7	0.11	health care	12	0.12
25	donald trump	6	0.16	vaccine candidates	7	0.11	home orders	12	0.12
26	international community	6	0.16	chief executive	6	0.09	national institute	12	0.12
27	president donald	6	0.16	conspiracy theorists	6	0.09	anthony fauci	11	0.11
28	president donald trump	6	0.16	epidemic preparedness	6	0.09	Covid-19 cases	11	0.11
29	USA politicians	6	0.16	epidemic preparedness innovations	6	0.09	death toll	11	0.11
30	adverse effects	5	0.13	immune response	6	0.09	health officials	11	0.11

Similarities

The main themes of China Daily, The Guardian, and USA Today were similar in the following ways:

a) The Vaccine of Covid-19 Was the Highest Priority

All the newspapers published news on the COVID-19 vaccine issue on a regular note. They have published more than news daily on average. When we analyzed the texts, 'vaccine' was the highest used word in the word frequency list. Among the entire word's list from China Daily, the word 'vaccine' was used 317 times, which is equal to 4.46% of the entire news. Similarly, The Guardian used the word 'vaccine' 396 times which is 3.08% and the USA today used 416 (2.96%) times from the entire texts of their news items related to the Covid-19 vaccine.

All newspapers used the term 'Covid-19 Vaccine' most when the analysis of the word cluster came out. According to the analysis, China Daily used this word cluster as the highest used cluster of the word as high as 1.28% among the entire text of their news collection. The Guardian also used the cluster 0.65% which was highest among their list of word clusters and USA Today used the term 0.60% which was also the highest word cluster among their list of word clusters.

b) Framing the Covid-19 Clinical Trials

The second-highest word frequency was 'Covid-19'. China Daily used the word 239 times (3.36%), The Guardian used it 320 times (2.49%) and USA Today used it 407 times (2.12%) by. Supporting that data, the word cluster list showed, the cluster word 'Covid-19 Pandemic' was used by all the three newspapers often. China Daily used the term 8 times which is 0.21% of the entire word clusters, The Guardian used it 12 times (0.19%) and USA Today wrote about the 'Covid-19 Pandemic' 20 times that counts 0.20%.

In the word frequency list, China Daily was shown as the highest user of the word 'trials' 0.83% (59 times), where The Guardian used the same term 54 times (0.42%). Comparatively, USA Today used the term 'trials' less than 60 times (0.31%) among their entire words used in news. Interestingly, the list of word combinations revealed that all the three newspapers 'clinical trials'

as their top three-word cluster. China Daily and The Guardian used the word cluster 'clinical trials' as the second most used word cluster among the entire word combinations where it took third place on the list of USA Today. China Daily used the term 26 times (0.70%), The Guardian used it 16 times (0.25%) and USA Today 30 times (0.30%). While it took the third position in the word combination list of USA Today, the second position of the word combinations in the newspaper was occupied by the term 'public health'.

c) Framing Public Health

According to the analysis, the term 'people' was used by China Daily 76 (1.07%) times, which was the fifth-highest used word in their word frequency list, in the list of The Guardian, with 118 (0.92) times taking third most used word and 120 (0.63%) times in the list of USA Today which was fourth in the list of their word frequency. The analysis also revealed from the word cluster list that, 'Public Health' (people health) was also highly used in the China Daily with 10 (0.27%) times, The Guardian eight (0.12%) times and USA Today used it more than the other two 39 (0.39%) times.

Dissimilarities

a) Framing each other:

China Daily framed their national issues but they have also used the term 'USA'. Both the terms 'China' and 'USA' were found 93 times (1.31%) while the UK or their research and Oxford University could not make it to the list. Interestingly, The Guardian used their country's nameless than the United States. They have used the term 'USA' (114 times, 0.89%) more than the 'UK' (42 times, 0.33%). They are the only news organization that tried to cover both the 'USA' and 'China'. The term 'China' was used 35 times and 0.27% among the word frequency list of The Guardian. On the other hand, USA Today was more focused on their own as they have covered 'USA' 0.34% (66 times) in between their entire text. But none of the other two countries (China and the UK) were able to have a mark on the top 50-word frequency list of USA Today.

Word combinations also reflect the same. In the text of China Daily, terms like 'Oxford Vaccine' (9 times, 0.24%) and 'USA Government' (8 times, 0.21%) was found as a prominent term, but USA Today didn't show any significant role to cover China and UK and relevant terms in the list of word combinations. While the Guardian framed USA president 'Donald Trump' (10 times, 0.15%) and 'White House' (13 times, 0.20%) with possible highest priority while their own UK's Prime Minister 'Boris Johnson' got comparatively less attention (7 times, 0.11%). It is noticeable that anything related to China and Chinese vaccine development was not found in the list of top word combinations in the Guardian newspaper.

On the other side, China Daily has mentioned their vaccine candidate's name 'Adeno Type 5 Vector' on a very high number (11 times, 0.29%) in word cluster list (4th among the word cluster list of China Daily) that The Guardian and USA Today newspaper didn't do with the vaccines from the United Kingdom and the United States.

b) National and Global Perspectives

China Daily used the terms like 'Global' and 'International' on a regular note, The Guardian's 'Global' perspective was in the top five words whereas, USA Today used global issues regarding Covid-19 vaccine on limited times comparatively. The dataset shows that, in China Daily's word frequency list, words like 'Global' (40 times and 0.56%) and 'International' (40 times and 0.56%) had the tenth and eleventh position among the entire texts of China Daily. It was noted that The Guardian has given the importance of 'Global' issues with the highest priority (5th position, 74 frequency, and 0.58%). But when it came to revealing the dataset of USA Today, the usage of local issues like 'home', 'Trump', 'Americans', 'government' were significant and frequently found in the top word's list before the word 'Global' (27th position, 44 times and 0.23%). Only The Guardian had UK, USA, and China in their top ten words list as well as they had European Union in the top half on the word's list.

c) Framing the World Health Organization (WHO)

According to the previous studies during global health crisis like SARS (Tian & Stewart, 2005), World Health Organization (WHO) was mentioned as one of the top words in the word's list of BBC and CNN (No study found on Al Jazeera) also Luther and Zhou (2005) found the relevance of the USA and Chinese Media with World Health Organization in their study, where the coverage of WHO in the British media was also found (Wallis & Nerlich, 2005). WHO was found in the word lists of China Daily (32 times, 0.45%), The Guardian (39 times, 0.30%). It is noticeable that WHO did not appear in the top 50-word list of USA Today. Also, the United Nations (UN) could not make the list of top fifty words in any of the newspaper's text.

DISCUSSION

China, the United Kingdom, and the United States have a political history among them (Breslin, 2016). From the historical point of view after World War II, the United Kingdom and the USA are still on the same footing (Oliver & Williams, 2016). China has been yet another world power using geopolitics and diplomacy since the beginning of the new millennium. In a previous study, it has been shown that China is becoming a threat to world leaders such as the United Kingdom and America, especially after the post-cold war period (Fels, 2016; Oliver & Williams, 2016; Pan & Lo, 2017). Media have always played an influential role in bringing up this issue (Stockmann & Gallagher, 2011; Zhou, 2008). Interestingly, China Daily and The Guardian showed updates of the vaccine progress of the USA while they had a race among themselves on the invention of the Covid-19 vaccine issue but USA Today was busy on their issues related to the vaccine. In this circumstance, the conflict frame among these newspapers was seen from the point of political perspective when USA Today was less interested in showing the progress of the UK and China. Rejecting news and updates related to other countries were also framed by the USA Today that connects the rejection frame.

China Daily and The Guardian thought World Health Organization (WHO) has a news value for their news but USA Today framed-out the World Health Organization (WHO) with the least interest using the rejection method of framing. It is just opposite to the framing analysis during the Severe Acute Respiratory Syndrome (SARS) outbreak studied by Tian and Stewart (2005). In a global disease or pandemic issue or epidemic issues, where WHO and their guiding principle,

strategic plans or comments are important, here the case was quite the opposite in the case of USA Today. We assume that, as the USA has halted the funding of WHO after the Covid-19 global transmission, USA Today has rejected their news slant regarding the WHO (See: BBC News, 2020; Beaumont & Boseley, 2020)

The expectation and the hope for the vaccine of Covid-19 are on the edge. Due to the global economy and public health support the whole world is looking for the vaccine of Covid-19 with an urge (Ibrahim & Siddiqui, 2020; CGTN Africa, 2020; Thanh Le et al., 2020). Misleading and disinformation has been spread by the miscellaneous sources especially the social media (Cinelli et al., 2020). To clarify this disinformation, mainstream media has to come forward (Benkler et al., 2018). These national daily newspapers play the role of global information leaders to disseminate the facts on the Covid-19 related issues. In this case, the newspapers played the role of responsibility to inform the authorities.

All the newspapers were trying to connect with the people. The study found that a news angle for all of these newspapers were 'people' and 'public health'. They threatened the global health system and only a few countries were prepared to address the pandemic where most nations are battling with their best efforts. Thus, 'people' and 'public' were the news slant where those national dailies were trying to focus. This presentation engaged people to the highest possible extent and enabled readers to have a large number of readings from individuals and public health. Interestingly, when the governments were fighting battles with public health issues, fatality, and economic challenges, all these newspapers portrayed the state of the governments' public health. They were closely observing the local government or national governments, and the systems to being responsible for the concurrent problems. In our findings, all these major themes, including 'rejection frame', 'conflict frame', 'public interest', and 'economic frame', were found in the news published by these news outlets (Ju et al., 2023). News angles such as the economic issues due to the virus, how the public got affected, and publicizing the effectiveness of their local vaccine for COVID-19 were strongly framed by them. By analyzing both single-word statistics and word cluster statistics, it was visible.

It's the local news that matters to residents of the nation within a boundary. According to Witschge et al. (2016), it's vital to the local community, but for some, it may not be so. National news also means that when the news media cover the news that is important for their state of origin and that matters most to nationals, but may also be important to international readers and the public (Fletcher & Nielsen, 2017). Whereas, the idea of free news flow began with the international press. Historically, international news was characterized by authors such as Kim and Barnett (1996) with Shoemaker (2006). Here, international news means that the coverage is related to international political issues or paces of crisis for the international public (Grasland, 2020). In this context, these national dailies are focusing on local news and international news. Here, according to the findings, we assume that the United States of America is focused only on their local issues related to the updates of the Covid-19 vaccine where the Guardian and China Daily focus on the global perspectives. The rejection frame of international matters was identified by USA Today according to our assumption.

CONCLUSION

In conclusion, it can be said that China Daily, The Guardian, and USA Today are the mainstream newspapers, followed by about 4 million readers of print versions and millions (to date) of online readers. So, it is significant to study their news framing. The analysis of these newspapers revealed their framing strategies associated with geopolitics, socioeconomics, and public attention. Such frames were found where they were trying to use the responsibility frames to draw authority attention as well as trying to connect the people. Additionally, rejection and inclusion framing was also seen through this study as the World Health Organization (WHO) was rejected by the USA Today newspaper.

This study shows that while we live in a world of global knowledge sharing due to the development of communication technology, the media structures are still in a trend of publishing cross-border reporting of news. The country of origin for news reports is also a purporting consideration for the news media outlets. This type of findings shows the impact and multidimensional representation of news stories in the specific.

The study reveals that the national news media are urgently and effectively covering news about the Covid-19 pandemic. The amount of news and follow-ups on Covid-19's vaccine is significant because of the readers' news interest. Consequently, national vaccine development news reporting is a high priority. The slant on U.S. vaccine updates was provided by China Daily and the Guardian, but USA Today only presented national issues with priority. The World Health Organization (WHO) did not appear with precedence in the case of USA Today, either. A strong reason might be the split-mass view of the WHO as the US government has chosen to cut the WHO budget despite being the highest donor (Moncus & Connaughton, 2020).

The limitations of this research are, it is focused on the frequency analysis of the content (Table: 1) and the analysis of the word cluster (Table: 2). The content of the China Daily, The Guardian, and USA Today's texts were only observed and evaluated from the tables (Table: 1 and Table: 2). Much more sophisticated and specialized techniques and methods could be drawn into the future study. Multidimensional scaling and analysis of neural networks could be analyzed for the relations between main literature concepts to find more coherent frames.

Despite the limitations, this study also indicates that the manual text analysis may be pre-assumed when evaluating the data but the researchers do not have the bias of pre-assumptions in the computer-assisted text analysis. For this purpose, the machine-based text analysis was chosen to obtain the results. The research was possible because of the new technologies such as the internet, social networking sites such as Facebook and computer-assisted text analysis. With some big advantages of machine-based study, this study shows with opportunistic hope possible future studies.

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BIODATA

Aftab Hossain is an Assistant Professor and Head of the Department of Journalism, Media and Communication, Daffodil International University. Also, he is a PhD candidate at the School of Communication, Universiti Sains Malaysia. His research interests include social media, media framing, online harassment and bullying, media biases and cinema.

Email: aftab.hossain@gmail.com ; aftab.jmc@diu.edu.bd

Dr. Juliana Abdul Wahab is an Associate Professor at the School of Communication, Universiti Sains Malaysia. Her research areas include media studies, specifically television and radio, audience studies, popular culture, gender studies, script writing, documentary, and public service announcement production. Email: julia@usm.my

Mr. Md. Saidur Rahman Khan is a Doctoral candidate at Yeungnam University, South Korea. Prior to his tenure as a Lecturer in the Department of Journalism, Media, and Communication, Daffodil International University, His diverse research interests encompass Politics and International Relations, Big Data, AI and Machine Learning, Film Studies, and Gender Studies, underscoring a multidisciplinary approach to contemporary academic inquiry. Email: srkhan647@gmail.com

Musabbir Hasan Sammak is a Lecturer in the Department of Software Engineering at Daffodil International University. His research explores the intersections of data science with interdisciplinary fields like biology and sociology. Email: musabbirhasansammak@gmail.com ; musabbir.swe@diu.edu.bd

Jannatul Bakia Sweety holds a Master of Science in Sustainable Cities and Communities from Universiti Sains Malaysia. She currently works as a Research Executive at a consulting firm. Her research interests focus on community development, waste management, media and gender biases, and climate change. Email: jannatulbakia5555@gmail.com

REFERENCES

- Adams-Prassl, A., Boneva, T., Golin, M., & Rauh, C. (2020). *Inequality in the impact of the Covid-19 shock: New survey evidence for the UK* [Working paper, University of Cambridge]. <https://doi.org/10.17863/CAM.52477>
- Afzal, N., & Harun, M. (2020). News framing of the Arab Spring conflict from the lens of newspaper editorials. *International Journal of English Linguistics*, 10(1), 352-363. <https://doi.org/10.5539/ijel.v10n1p352>
- Araújo, B., & Prior, H. (2020). Framing political populism: The role of media in framing the election of Jair Bolsonaro. *Journalism Practice*, 15(2), 226-242. <https://doi.org/gmtkmm>
- Bauer, M., & Gaskell, G. (2011). Qualitative researching with text, image and sound. In, *Qualitative researching with text, image and sound*. SAGE. <https://doi.org/dk73h2>
- BBC News. (2020, April 15). Coronavirus: US to halt funding to WHO, says Trump. <https://www.bbc.com/news/world-us-canada-52289056>
- Beaumont, P., & Boseley, S. (2020). What does the WHO do, and why has Trump stopped supporting it? *The Guardian*. <https://www.theguardian.com/world/2020/apr/15/world-health-organization-why-has-trump-suspended-funding>
- Benkler, Y., Faris, R., & Roberts, H. (2018). *Network propaganda: Manipulation, disinformation, and radicalization in American politics*. Oxford University Press. <https://doi.org/dgx3>
- Binder, C. (2020). Coronavirus fears and macroeconomic expectations. *The Review of Economics and Statistics*, 102(4): 721–730. https://doi.org/10.1162/rest_a_00931
- Boyle, K., & Mower, J. (2018). Framing terror: A content analysis of media frames used in covering ISIS. *Newspaper Research Journal*, 39(2), 205–219. <https://doi.org/gdj76q>
- Breslin, S. (2016). China and the global political economy. *Asian Business & Management*, 9, 285–288. <https://doi.org/10.1057/abm.2010.10>
- Bunea, A. (2020). Understanding the European commission's use of politicisation in the negotiation of interinstitutional agreements: The role of consultations and issue framing. *Journal of European Public Policy*, 27(3), 439–459. <https://doi.org/ngwf>
- Busch, C., Maret, P. S. De, Flynn, T., Kellum, R., Le, S., Meyers, B., Saunders, M., White, R., & Palmquist, M. (1997). Content Analysis. Writing@CSU. Colorado State University. <https://writing.colostate.edu/guides/guide.cfm?guideid=61>
- Business Insider. (2020). *Coronavirus: Business & economy. COVID-19 business & economic impact tracker*. <https://www.businessinsider.com/Covid-19-business-impact?IR=T>
- Carley, K. (1990). Content analysis. *The Encyclopaedia of Language and Linguistics*, 2, 725-730. Edinburgh: Pergamon Press. http://www.casos.cs.cmu.edu/publications/papers/carley_1990_contentanalysis.PDF
- Cavaca, A. G., Emerich, T. B., Vasconcellos-Silva, P. R., Santos-Neto, E. T. dos, & Oliveira, A. E. (2016). Diseases neglected by the media in Espírito Santo, Brazil in 2011–2012. *PLoS Neglected Tropical Diseases*, 10(4), e0004662. <https://doi.org/f8xd8t>
- CGTN Africa. (2020, June 26). WHO chief urges COVID-19 vaccine development at “unprecedented speed”.
- Chan, H. K., Wang, X., Lacka, E., & Zhang, M. (2016). A mixed-method approach to extracting the value of social media data. *Production and Operations Management*, 25(3), 568–583. <https://doi.org/10.1111/poms.12390>

- Chandra, Y., Shang, L., Chandra, Y., & Shang, L. (2019). Computer-assisted qualitative research: an overview. In, *Qualitative research using R: A systematic approach* (pp. 21–31). Springer Singapore. https://doi.org/10.1007/978-981-13-3170-1_2
- Choi, J. (2018). National image of North Korea in South Korean news media. *Journal of Public Affairs*, 18(4), e1710. <https://doi.org/10.1002/pa.1710>
- Chong, D., & Druckman, J. N. (2007). Framing theory. *Annual Review of Political Science*, 10(1), 103–126. <https://doi.org/10.1146/annurev.polisci.10.072805.103054>
- Chuang, J., Wilkerson, J. D., Stewart, B. M., & Roberts, M. E. (2015). Computer-assisted content analysis: Topic models for exploring multiple subjective interpretations. *NIPS Workshop on Human-Propelled Machine Learnin*, 1–9.
- Cinelli, M., Quattrociochi, W., Galeazzi, A., Valensise, C. M., Brugnoti, E., Schmidt, A. L., Zola, P., Zollo, F., & Scala, A. (2020). *The COVID-19 social media infodemic*. <https://doi.org/ngws>
- Cormick, C. (2019). Who doesn't love a good story? - What neuroscience tells about how we respond to narratives. *Journal of Science Communication*, 18(5), Y01. <https://doi.org/10.22323/2.18050401>
- Cypress, B. S. (2019). Data analysis software in qualitative research: Preconceptions, expectations, and adoption. *Dimensions of Critical Care Nursing*, 38(4), 213–220. <https://doi.org/10.1097/DCC.0000000000000363>
- Czibik, Á., Pápay, B., Szántó, Z., & Tóth, I. J. (2016). *Computer assisted content analysis of the print press coverage of corruption in Hungary*. Project Report ANTICORRP.
- de Vreese, C. H. (2005). News framing: Theory and typology. *Information Design Journal*, 13(1), 51–62. <https://doi.org/10.1075/idjdd.13.1.06vre>
- Dincecco, M., & Wang, Y. (2018). Violent conflict and political development over the long run: China versus Europe. *Annual Review of Political Science*, 21(1), 341–358. <https://doi.org/10.1146/annurev-polisci-050317-064428>
- Dongke, P., Sannusi, S. N., & Mustaffa, N. (2022). Covering Covid-19 pandemic on short video platforms in China: A content analysis of Douyin accounts of People's Daily and China Daily. *Jurnal Komunikasi: Malaysian Journal of Communication*, 38(4), 163-80.
- Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication*, 43(4), 51–58. <https://doi.org/10.1111/j.1460-2466.1993.tb01304.x>
- Entman, R. M. (2004). *Projections of power: Framing news, public opinion, and U.S. foreign policy*. University of Chicago Press.
- Estupinan, J. D. O. (2017). The coverage of China in the Latin American press: Media framing study. *Cogent Arts and Humanities*, 4(1), 1287319. <https://doi.org/ngwt>
- Fels, E. (2016). Shifting power in Asia-Pacific? The rise of China, Sino-US competition and regional middle power allegiance. *Springer*. <https://doi.org/10.1007/978-3-319-45689-8>
- Fletcher, R., & Nielsen, R. K. (2017). Are news audiences increasingly fragmented? A cross-national comparative analysis of cross-platform news audience fragmentation and duplication. *Journal of Communication*, 67(4), 476–498. <https://doi.org/gbr4c4>
- Franzosi, R. (1995). Computer-assisted content analysis of newspapers - Can we make an expensive research tool more efficient? *Quality & Quantity*, 29(2), 157–172. <https://doi.org/10.1007/BF01101896>

- Gamson, W. A., & Modigliani, A. (1989). The changing culture of affirmative action. *Research in Political Sociology*, 3, 137-177.
- Gamson, W. A. (1992). *Talking politics*. Cambridge University Press.
- Gamson, W. A. (2015). News as framing: "Comments on Garbner". *Mercian Behavioral Scientist*, 33, 157–161. <http://repositorio.unan.edu.ni/2986/1/5624.pdf>
- Gates, B. (2020). Responding to Covid-19 - A once-in-a-century pandemic? *New England Journal of Medicine*, 382(18), 1677–1679. <https://doi.org/10.1056/NEJMp2003762>
- Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. Harvard University Press.
- Grasland, C. (2020). International news flow theory revisited through a space–time interaction model: Application to a sample of 320,000 international news stories published through RSS flows by 31 daily newspapers in 2015. *International Communication Gazette*, 82(3), 231–259. <https://doi.org/10.1177/1748048518825091>
- Greussing, E., & Boomgaarden, H. G. (2021). Promises and pitfalls: Taking a closer look at how interactive infographics affect learning from news. *International Journal of Communication*, 15, 3336–3357.
- Guariglia, A., & Mateut, S. (2016). External finance and trade credit extension in China: does political affiliation make a difference? *European Journal of Finance*, 22(4–6), 319–344. <https://doi.org/10.1080/1351847X.2012.762030>
- Hackett, R. A. (1984). Decline of a paradigm? Bias and objectivity in news media studies. *Critical Studies in Mass Communication*, 1(3), 229–259. <https://doi.org/b6tjm5>
- Hamborg, F., Donnay, K., & Gipp, B. (2019). Automated identification of media bias in news articles: an interdisciplinary literature review. *International Journal on Digital Libraries*, 20(4), 391–415. <https://doi.org/10.1007/s00799-018-0261-y>
- Herman, E. S., & Chomsky, N. (2012). Manufacturing consent: The political economy of the mass media. In E. King, & J. Chapman (Eds.), *Key readings in journalism* (pp. 380–397). Routledge.
- Hossain, A., Wahab, J. A., & Khan, M. S. R. (2022). A computer-based text analysis of Al Jazeera, BBC, and CNN news shares on Facebook: Framing analysis on Covid-19 issues. *Sage Open*, 12(1), 21582440211068497.
- Ibrahim, A., & Siddiqui, U. (2020). WHO urges countries to 'wake up' and halt coronavirus: Live. *Al Jazeera*. <https://www.aljazeera.com/news/2020/07/reversal-texas-orders-face-masks-public-Covid-19-live-200703002449561.html>
- Ju, W., Sannusi, S. N., & Mohamad, E. (2023). "Public goods" or "diplomatic tools": A framing research on Chinese and American media reports regarding Chinese COVID-19 vaccine. *Media Asia*, 50(1), 43-81.
- Kanaker, O., Abughazlih, M. O., & Kasmani, M. F. (2020). Media framing of minorities' crisis: A study on Aljazeera and BBC news coverage of the Rohingya. *Jurnal Komunikasi: Malaysian Journal of Communication*, 36(2), 1–16. <https://doi.org/10.17576/JKMJC-2020-3602-01>
- Kee, C. P., Ibrahim, F., Ahmad, F., & Khiang, C. C. (2012). Frame contention between news sources and news media: Framing the dispute of teaching mathematics and science in English. *Asian Social Science*, 8(5), 16–28. <https://doi.org/10.5539/ass.v8n5p16>

- Kim, K., & Barnett, G. A. (1996). The determinants of international news flow: A network analysis. *Communication Research*, 23(3), 323–352. <https://doi.org/bhw2rs>
- Kuckartz, U., & Rädiker, S. (2019). *Analyzing qualitative data with MAXQDA: Text, audio, and video*. Springer.
- Lewis, S. C. (2020). The objects and objectives of journalism research during the Coronavirus pandemic and beyond. *Digital Journalism*, 8(5), 681–689. <https://doi.org/gg2tfg>
- Li, M. (2018). Intermedia attribute agenda setting in the context of issue-focused media events: Caitlyn Jenner and transgender reporting. *Journalism Practice*, 12(1), 56–75. <https://doi.org/10.1080/17512786.2016.1273078>
- Liu, S., Yang, L., Zhang, C., Xiang, Y. T., Liu, Z., Hu, S., & Zhang, B. (2020). Online mental health services in China during the COVID-19 outbreak. *The Lancet Psychiatry*, 7(4), e17–e18). Elsevier Ltd. [https://doi.org/10.1016/S2215-0366\(20\)30077-8](https://doi.org/10.1016/S2215-0366(20)30077-8)
- Lurie, N., Saville, M., Hatchett, R., & Halton, J. (2020). Developing COVID-19 vaccines at pandemic speed. *The New England Journal of Medicine*, 382(21), 1969–1973. <https://doi.org/ggq8bc>
- Luther, C. A., & Zhou, X. (2005). Within the boundaries of politics: News framing of SARS in China and the United States. *Journalism and Mass Communication Quarterly*, 82(4), 857–872. <https://doi.org/10.1177/107769900508200407>
- Marjaei, S., Yazdi, F. A., & Chandrashekara, M. (2019). MAXQDA and its application to LIS research. *Library Philosophy and Practice (e-journal)*. University of Nebraska Lincoln. <https://digitalcommons.unl.edu/libphilprac/2325/>
- Mason, A. (2019). Media frames and crisis events: Understanding the impact on corporate reputations, responsibility attributions, and negative affect. *International Journal of Business Communication*, 56(3), 414–431. <https://doi.org/10.1177/2329488416648951>
- Moderna. (2020). Moderna's work on a COVID-19 vaccine candidate.
- Moncus, J. J., & Connaughton, A. (2020). Americans' views on World Health Organization split along partisan lines as Trump calls for U.S. to withdraw. *Pew Research Center*. <https://www.pewresearch.org/fact-tank/2020/06/11/americans-views-on-world-health-organization-split-along-partisan-lines-as-trump-calls-for-u-s-to-withdraw/>
- Oliver, T., & Williams, M. J. (2016). Special relationships in flux: Brexit and the future of the US-EU and US-UK relationships. *International Affairs*, 92(3), 547–567. <https://doi.org/gcjqdb>
- Oxford Vaccine Group. (2020, May 18). Funding and manufacturing boost for UK vaccine programme. <https://www.ovg.ox.ac.uk/news/funding-and-manufacturing-boost-for-uk-vaccine-programme>
- Pan, S. Y., & Lo, J. T. Y. (2017). Re-conceptualizing China's rise as a global power: a neo-tributary perspective. *Pacific Review*, 30(1), 1–25. <https://doi.org/gnvvqg>
- Popping, R. (2000). *Computer-assisted text analysis*. Sage.
- Qiu, Y., Chen, X., & Shi, W. (2020). Impacts of social and economic factors on the transmission of Covid-19 disease 2019 (COVID-19) in China. *Journal of Population Economics*, 33, 1127–1172. <https://doi.org/10.1007/s00148-020-00778-2>
- Rossum, G. Van, & Drake, F. L. (2006). *Python reference manual*. PythonLabs.
- Saleem, N. (2007). US media framing of foreign countries image: An analytical perspective. *Canadian Journal of Media Studies*, 2(1), 130–162.

- Samuelsson, K., Barthel, S., Colding, J., Macassa, G., & Giusti, M. (2020). Urban nature as a source of resilience during social distancing amidst the Covid-19 pandemic. *OSFPreprints*. <https://doi.org/10.31219/osf.io/3wx5a>
- Schultz, J. (1998). *Reviving the fourth estate: Democracy, accountability and the media*. Cambridge University Press.
- Semetko, H. A., & Valkenburg, P. M. (2000). Framing European politics: A content analysis of press and television news. *Journal of Communication*, 50(2), 93–109. <https://doi.org/cg494k>
- Shoemaker, P. J. (2006). News and newsworthiness: A commentary. *Communications*, 31(1), 105–111. <https://doi.org/10.1515/COMMUN.2006.007>
- Shoemaker, P. J., & Riccio, J. R. (2016). Gatekeeping. In G. Mazzoleni (Ed.), *The international encyclopedia of political communication* (pp. 1–5). Wiley. <https://doi.org/ngw3>
- Sinovac Biotech. (2020). Sinovac reports. http://www.sinovac.com/?optionid=754&auto_id=906
- Stockmann, D., & Gallagher, M. E. (2011). Remote control: How the media sustain authoritarian rule in China. *Comparative Political Studies*, 44(4), 436–467. <https://doi.org/b5cmdt>
- Strömbäck, J., Shehata, A., & Dimitrova, D. V. (2008). Framing the Mohammad cartoons issue: A cross-cultural comparison of Swedish and US press. *Global Media and Communication*, 4(2), 117–138. <https://doi.org/10.1177/1742766508091516>
- Thanh Le, T., Andreadakis, Z., Kumar, A., Gómez Román, R., Tollefsen, S., Saville, M., & Mayhew, S. (2020). The COVID-19 vaccine development landscape. *Nature Reviews Drug Discovery*, 19, 305–306. <https://doi.org/10.1038/d41573-020-00073-5>
- The Guardian*. (2020). Guardian media group. <https://www.theguardian.com/international>
- Tian, Y., & Stewart, C. M. (2005). Framing the sars crisis: A computer-assisted text analysis of CNN and BBC online news reports of sars. *Asian Journal of Communication*, 15(3), 289–301. <https://doi.org/10.1080/01292980500261605>
- University of Twente. (2004). *Communication theories sorted by category*. <https://www.utwente.nl/en/com/com-theories/>
- USA TODAY. (2020). Gannett Company. <https://www.usatoday.com/>
- Wallis, P., & Nerlich, B. (2005). Disease metaphors in new epidemics: The UK media framing of the 2003 SARS epidemic. *Social Science and Medicine*, 60(11), 2629–2639. <https://doi.org/10.1016/j.socscimed.2004.11.031>
- Wheeler, R. S. (1999). *The workings of language: From prescriptions to perspectives* (R. S. Wheeler, Ed.). Greenwood Publishing.
- WHO. (2020, April 23). Draft landscape of COVID-19 candidate vaccines. <https://www.who.int/docs/default-source/blue-print/draft-landscape-of-covid-19-candidate-vaccines.pdf>
- Witschge, T., Anderson, C. W., Domingo, D., & Hermida, A. (2016). *The SAGE handbook of digital journalism*. SAGE.
- Wolf, A., & Jenkins, A. (2018). What's in a name? The impact of reputation and rankings on the teaching income of English universities. *Higher Education Quarterly*, 72(4), 286–303. <https://doi.org/10.1111/hequ.12162>
- Wu, C., & Xiao, J. (2020). Evolving frames: British newspaper coverage of repression and resistance in China over Time, 1949–2009. *Journalism Practice*, 15(4), 544–565. <https://doi.org/10.1080/17512786.2020.1730222>

- Xiang, Y. T., Yang, Y., Li, W., Zhang, L., Zhang, Q., Cheung, T., & Ng, C. H. (2020). Timely mental health care for the 2019 Covid-19 outbreak is urgently needed. *The Lancet Psychiatry*, 7(3), 228–229. [https://doi.org/10.1016/S2215-0366\(20\)30046-8](https://doi.org/10.1016/S2215-0366(20)30046-8)
- Young, M. L., Hermida, A., & Fulda, J. (2018). What makes for great data journalism? A content analysis of data journalism awards finalists 2012–2015. *Journalism Practice*, 12(1), 115–135.
- Zheng, C., He, G., & Peng, Z. (2015). A study of web information extraction technology based on beautiful soup. *Journal of Computers*, 10(6), 381–387. <https://doi.org/ghdz22>
- Zhou, X. (2008). Cultural dimensions and framing the internet in China: A cross-cultural study of newspapers' coverage in Hong Kong, Singapore, the US and the UK. *International Communication Gazette*, 70(2), 117–136. <https://doi.org/10.1177/1748048507086908>