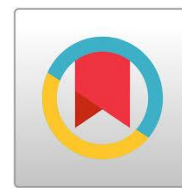


The Communication in Social Media About COVID-19 Vaccine: Mapping and Bibliometrics Analysis




Komunikasi di Media Sosial Tentang Vaksin COVID-19: Pemetaan dan Analisis Bibliometrik

Dimas Subekti¹*

¹ Master of Government Affairs and Administration, Universitas Muhammadiyah Yogyakarta, Indonesia.

¹ Special Regions of Yogyakarta 55183, Indonesia

Corresponding Author: dsubekti05@gmail.com

ARTICLE INFORMATION	
<p>Keywords <i>Communication;</i> <i>Social Media;</i> <i>COVID-19 Vaccine;</i> <i>Bibliometric;</i> <i>Scopus;</i></p>	<p>ABSTRACT COVID-19 emerged at the end of 2019 in China, and has spread to all corners of the world. So many parties are creating vaccines to end the COVID-19 pandemic. Simultaneously in today's digital world, there are many studies discussing the COVID-19 vaccine spread in terms of communication on social media which is the most popular social network today. Therefore, the purpose of this study is to explain global research trends related to the use of social media as a means of spreading COVID-19 vaccines, both positive and negative, from 2020 to 2021. This study uses bibliometric analysis and also uses VOSViewer to map scientific publications. This study also uses the Word frequency feature in NVIVO 12 plus. Findings in this study that the publication of scientific research on communication in social media about the COVID-19 vaccine has increased in the last two years. The mapping covers all countries whose publications are indexed by Scopus, the United States has the most significant contribution to research publications. Journal of Medical Internet Research is the journal that publishes the most research. The University of Pennsylvania is the institution that has the highest contribution. Topics that have good opportunities for future research are interpersonal, vaccination, vaccines, immunology, and COVID-19 vaccines. The narrative of global scientific research publications related to communication in social media about the COVID-19 vaccine is COVID-19, vaccine, and social media.</p>
<p>Kata Kunci <i>Komunikasi;</i> <i>Media Sosial;</i> <i>Vaksin COVID-19;</i> <i>Bibliometrik;</i> <i>Scopus;</i></p>	<p>ABSTRAK COVID-19 muncul di penghujung tahun 2019 di Tiongkok, dan telah menyebar ke seluruh penjuru dunia. Begitu banyak pihak yang menciptakan vaksin untuk mengakhiri pandemi COVID-19. Bersamaan dengan itu di dunia digital saat ini, banyak penelitian yang membahas tentang penyebaran vaksin COVID-19 dari segi komunikasi di media sosial yang merupakan jejaring sosial terpopuler saat ini. Oleh karena itu, tujuan dari penelitian ini adalah untuk menjelaskan tren penelitian global terkait penggunaan media sosial sebagai sarana penyebaran vaksin COVID-19, baik positif maupun negatif, dari tahun 2020 hingga 2021. Penelitian ini menggunakan analisis bibliometrik dan juga menggunakan VOSViewer untuk memetakan publikasi ilmiah. Penelitian ini juga menggunakan fitur frekuensi Word pada NVIVO 12 plus. Temuan dalam penelitian ini bahwa publikasi penelitian ilmiah tentang komunikasi di media sosial tentang vaksin COVID-19 meningkat dalam dua tahun terakhir. Pemetaan mencakup seluruh negara yang publikasinya terindeks scopus, Amerika Serikat memiliki kontribusi paling signifikan untuk publikasi penelitian. Journal of Medical Internet Research merupakan jurnal yang paling banyak menerbitkan penelitian. University of Pennsylvania adalah institusi yang memiliki kontribusi tertinggi. Topik yang memiliki peluang bagus untuk penelitian selanjutnya adalah interpersonal, vaksinasi, vaksin, imunologi, dan vaksin COVID-19. Narasi publikasi penelitian ilmiah global terkait komunikasi di media sosial tentang vaksin COVID-19 adalah COVID-19, vaksin, dan media sosial.</p>
<p>Article History Send 12th March 2022 Review 21th April 2022 Accepted 23th May 2022</p>	<p>Copyright ©2022 <i>Jurnal Aristo (Social, Politic, Humaniora)</i> This is an open access article under the CC-BY-NC-SA license. Akses artikel terbuka dengan model CC-BY-NC-SA sebagai lisensinya.</p> 

Introduction

In December 2019, a pneumonia outbreak of unknown origin was reported in Wuhan, Hubei Province, China. Pneumonia cases were connected to the Huanan Seafood Wholesale Market, according to epidemiological research. SARS-CoV-2 is a subgenus of the Sarbecovirus family of beta coronaviruses. Due to the global spread of SARS-CoV-2 and thousands of deaths caused by coronavirus illness, the World Health Organization declared a pandemic on March 12, 2020. (COVID-19). As a result of this pandemic, the world has paid a high price in terms of human lives lost, economic effects, and increased poverty (Ciotti et al., 2020). The COVID-19 pandemic is a massive challenge to living in the world. From the beginning of its appearance in Wuhan, China, in 2019, until now, in 2021, this pandemic has not seen completion. All countries in the world can not be separated from the impact and spread to make the World Health Organization (WHO) policies for human health (Daniel, 2020). The world is now watching with considerable concern as a new pandemic emerges, bringing massive misery, death, and disruption of regular life. The perception that what we are experiencing is fresh and strange adds to anxiety and fear (Morens, Daszak, Markel, & Taubenberger, 2020).

The spread of the COVID-19 pandemic throughout the world has made various countries try to overcome it. Some developed countries create an antidote to solve it, which is often called a vaccine. Vaccines are biological "weapons" that aid the immune system in combating disease. Vaccines are manufactured from disease-causing microorganisms or agents that have been killed and contain particular proteins (Halloran, Longini, Struchiner, & Longini, 2010). In the context of the COVID-19 vaccine, many COVID-19 vaccine candidates are being developed in several countries. Some of them have obtained permits to be used in emergencies. The efficacy of these vaccines also varies in protecting from the coronavirus. The Covid-19 vaccine is not the only weapon to fight pandemics worldwide, but at least this is one of the efforts to control the virus that continues to mutate and give rise to new variants (Haynes et al., 2020). Several COVID-19 vaccines that have emerged and are used worldwide, namely the Sinovac vaccine and Astrazeneca vaccine, were developed by researchers at the University of Oxford and AstraZeneca. The Sinopharm vaccine was developed by the Beijing BioInstitute Biological Products of China. The CanSino vaccine is another vaccine developed by researchers in China at CanSino Biologics. The Moderna vaccine from the United States was developed using messenger RNA (mRNA) genetic technology. The Pfizer-BioNTech vaccine was developed in the United States in collaboration with the German company BioNTech. The

Janssen vaccine was developed by Johnson & Johnson and the Russian researcher Sputnik V vaccine (Andreadakis et al., 2020).

With the emergence of many COVID-19 vaccines and emergency permits for their use have been issued by many countries. Information to the public about the COVID-19 vaccine is important. Because people will use the vaccine for their immunity. Therefore, the government in a country has a responsibility to communicate to its people. In the digital era like now, social media is one of the facilities used by the government in disseminating the policies that have been decided, including vaccine policies. The term "social media" refers to a collection of web-based apps that build on the conceptual and technological roots of Web 2.0 and allow for the production and exchange of User Generated Content (Kaplan & Haenlein, 2010) (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011). This technology fundamentally changed communication (Wirtz, Daiser, & Mermann, 2017). Social media allows for a quick and transparent manner of disseminating information and the potential to build services that involve public participation and boost the government's positive image (Budiana, H. R., Sjoraida, D. F., Mariana, D., & Priyatna, 2016).

The use of social media to communicate the COVID-19 vaccine in various countries has become an exciting material for world researchers to discuss in more depth (Harris & Moss, 2021). Leaders in politics and public health who are pushing COVID-19 vaccination should determine the most important factors that influence vaccination decisions (Benis, Seidmann, & Ashkenazi, 2021). Online social endorsement for the COVID-19 vaccination campaign in the United Kingdom is emerging as a source of vaccination data and an effective communication tool to encourage immunization. Super searchers will have fantastic resources to share thanks to informative social media efforts (Chadwick et al., 2021). Health and medical information is now widely available on social media. It is vital to understand the link between social media activity and influenza vaccination, as well as other vaccines, such as those against COVID-19 (Benis et al., 2021). New upgrades for the era of COVID-19 and globalized infectious diseases, as well as how to promote COVID-19 immunization on social media (Puri, Coomes, Haghbayan, & Gunaratne, 2020; Raza & Lantos, 2021).

This research is needed because it relates to looking at global research trends during a pandemic, how the movement of vaccine releases in various countries. More than that, seeing the use of social media as a means of communication related to the spread of vaccines is the subject of research by researchers around the world. Because as has been explained regarding the problem that many vaccines have appeared and have received emergency permits for their use in various countries (Cryshna, 2021). Furthermore, that information to the public becomes

important, and the most relevant means to use is social media. Mapping related research becomes very interesting to get topic updates for further research. Therefore, the purpose of this study is to explain global research trends related to the use of social media as a means of spreading COVID-19 vaccines, both positive and negative, from 2020 to 2021. The research uses bibliometrics, VOSviewer and NVIVO 12 plus in presenting and explaining the research topic. This research tries to do a mapping, so the use of bibliometrics, VOSviewer and NVIVO 12 plus is the right way because they have the facilities to answer this.

Method

This type of research is qualitative using a literature study approach. The Scopus search database was used to find studies connected to COVID-19 vaccination communication on social media from 2020 to 2021. The data sources from research from 2020 to 2021 are because the COVID-19 pandemic began to spread and the emergence of a vaccine in that year. The Scopus database has become the primary source of studies to evaluate scientific research. Scopus, as one of the world's largest data centers, can index scientific literature to offer reliable information on each scientific article's metadata, such as publishing data, abstracts, references, and other information (Valderrama-Zurián, Aguilar-Moya, Melero-Fuentes, & Aleixandre-Benavent, 2015). This study obtained 99 scientific publication documents from the Scopus database related to communication in social media about the COVID-19 vaccine. This study use bibliometric analysis to compile every article linked to COVID -19 vaccine communication on social media. Documents by affiliation, country or territory, type, topic source, and year are among the data displayed. This study also uses VOSViewer to map related scientific publications on communication in social media about the COVID-19 vaccine. Publication visualization in the form of co-occurrence analysis, this study employs VOSviewer. The graphical representation of bibliometric maps is given considerable attention by VOSviewer. VOSviewer is a program that allows you to create and visualize bibliometric networks (van Eck & Waltman, 2017). The VOSviewer's feature is useful for displaying big bibliometric maps in an easy-to-understand format (van Eck & Waltman, 2010). This study also uses the Word frequency feature in NVIVO 12 plus to display narratives in scientific research publications related to communication on social media about the COVID-19 vaccine. NVIVO 12 Plus is a qualitative data analysis program that makes it easier to collect, categorize, map, analyze, and visualize qualitative data, such as that gathered from papers (memos, reports, legislations, and photographic documents) and interviews (Salahudin, Nurmandi, & Loilatu, 2020).

Figure 1 shows take a data using the Scopus database source, and analysis process using Bibliometrics, NVIVO 12 plus and VOSviewer software as analysis tools.

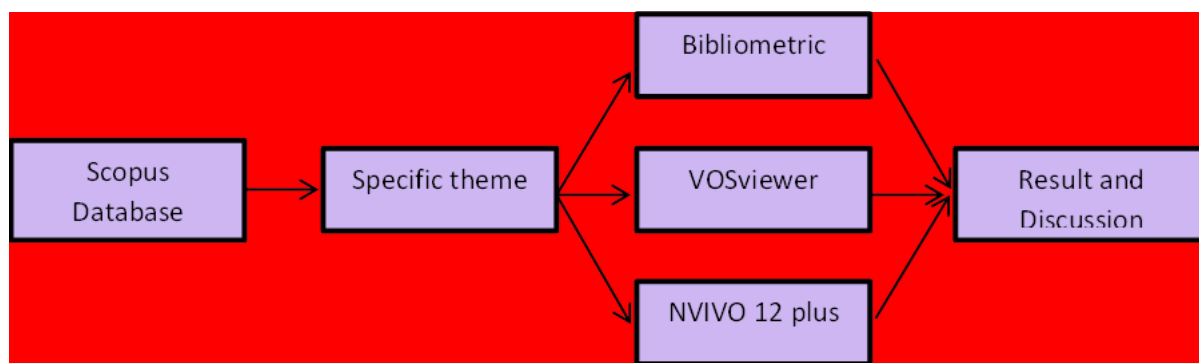


Figure 1. The flow of Data Retrieval and Processing Stages
Source: processed by the author, (2022)

Figure 1 shows the flow of the data retrieval and processing stages. First, look for the theme of The Communication in Social Media About COVID-19 Vaccine in the Scopus database. The second, download the data obtained with the RIS file type. Then to retrieve data bibliometrics from the Scopus chart by opening the analysis menu. Then the RIS file type is entered into the VOSviewer software to analyze the data. Finally, download the data results from the analysis menu on the scope and the results from VOSviewer. Furthermore, the data obtained from the Scopus database is also entered into the NVIVO 12 Plus. The results of the analysis are used to display theme narratives.

Literatur Review

Communication in Social Media

Social media services are a type of website whose primary objective is to create a platform for people with similar interests to connect and share information. The real benefit of social media is that it allows for large-scale connection and communication (Kuźniar & Szopiński, 2016). In the previous decade, people used social media to seek information from the public as an alternative to traditional media. Web 2.0 means that "content and applications are no longer created and published by individuals, but are instead continuously modified by all users in a participatory and collaborative fashion," Social media refers to "Internet-based applications that build on the ideological and technological foundations of Web 2.0." Because of the broad meaning of social media, it can be used for various objectives (Stieglitz, Mirbabaie, Ross, & Neuberger, 2018). Social media allows users to communicate and share information

with one another. Social media services are a type of website whose primary objective is to create a platform for people with similar interests to connect and share information. The real benefit of social media is that it allows for large-scale connection and communication (Kuzniar & Szopiński, 2016).

Social media is becoming a powerful force in all aspects of life. Various organizations utilize it to enhance their communication tactics. The use of social media and information and communication technologies (ICTs) improves collaboration among many stakeholders, allows for feedback, and encourages citizen participation. By encouraging "transparency, government responsiveness, and citizen participation," innovative technology contributes to democracy. To encourage public participation, government agencies use social media to connect with citizens. The use of social media as a bridge between the government and citizens is possible in various ways (Kumar, Kumar, & Ilavarasan, 2017). Social media is the most recent addition to the multitude of digital communication methods. Government agencies can use Twitter, Facebook, and Google+ to create new communication networks for connecting with residents and stakeholders (Meijer & Torenvlied, 2014). Governments are grasping this chance to improve citizen engagement in political and social affairs by utilizing social media as a crucial avenue of online interactive participation (Haro-de-rosario, Sáez-martín, & Caba-pérez, 2018). It has revolutionized how Internet users engage with one another, social media can play a significant role in connecting government and citizens (Vakeel, 2018). The government is increasingly using social media to communicate and collaborate with individuals on a two-way basis. Many countries use various social media technologies to engage with their population, such as instant messaging, wikis, and so on (Zavattaro & Sementelli, 2014).

The usage of social media in government has had an impact on it. First, in terms of public policy, social media in government has shifted the focus of public policy development and formulation. Second, government usage of social media has reshaped citizen-government relations by enhancing government-citizen involvement and collaboration. Third, the use of social media in e-government has resulted in new e-government processes and variance in municipal websites (Hui Zhang, 2017). The global trend of state agencies and officials using social media requires reasonable control. Usually, all interactions with government officials are formal, with clear rights and obligations that prevent corruption and violations of human rights (Bundin & Martynov, 2016).

Bibliometrics Analysis and Mapping

Bibliometrics is a type of statistical publication analysis that provides quantitative information about academic literature (Benckendorff & Zehrer, 2013). By analyzing the information obtained in the database, such as citations, authors, keywords, or the range of journals examined, bibliometric analysis provides insight into the evolution of literature and the flow of knowledge within a specific subject through time (Leung, Sun, & Bai, 2017). Bibliometric investigations have been used frequently to explore many research fields' evolution, growth, and prominence in academia (Apriliyanti & Alon, 2017). According to Pritchard (1969), Bibliometric analysis uses mathematics and statistics to comprehend nature and evolution in textual communication media. Citation and content analysis are usually the focus of traditional bibliometric methodologies (Zupic & Čater, 2015). To analyze publication patterns within a discipline, bibliometrics employs quantitative analysis of empirical data in published literature. As a result, scholars can use bibliometrics to assess the body of literature in their field of study to find essential themes (Vogel & Güttel, 2013). Bibliometric studies, which use publication records to assess the state and progress of a specific topic, have a long study history and have been used to assess the performance of publications in a variety of fields (Gan & Wang, 2014).

The bibliometric analysis examines the contributions of researchers, journals, institutes, and countries across time and offers information about the trend in research activity. It evaluates publications quantitatively and qualitatively using the literature system and literature metrology features as study objects (Gao et al., 2017) (Cobo, López-Herrera, Herrera-Viedma, & Herrera, 2011). The new bibliometric network study looks at the connections between keywords, countries, research institutes, and authors (Bonilla, Merigó, & Torres-Abad, 2015). Bibliometric indices, such as the most prominent nations, institutions, journals, publications, and authors, are used to assess the significance and prominence of research processes (Van Eck & Waltman, 2014).

In-network mapping, innovative indicators such as co-authorships links, bibliographic coupling links, and co-citation links are utilized to construct a cluster or theme based on bibliometric studies (van Eck & Waltman, 2010). VOSviewer has been widely utilized to conduct bibliometric mapping investigations in various research domains compared to other bibliometric software tools. VOS analysis, which is based on the visualization of similarities-VOS technique, condenses a lot of data into a single graphical figure. As a result, the text-mining routine's map comprises linked terms, forming a cluster or theme (Pan, Yan, Cui, & Hua, 2018). As a result of citation connections, bibliographic coupling, and co-occurrence

analysis, researchers can obtain themes or clusters of nations, institutions, and keywords used in the title and abstract of published articles. These themes use a single color to reflect the closeness of specific keywords, authors, journals, organizations, or nations in distinct research streams, allowing scholars to examine many facets of an underlying study topic (Noor, Guo, Shah, Saqib Nawaz, & Butt, 2020).

Results and Discussion

Analysis of Global Publication

Search results in the Scopus database with specific themes related to research topics get 99 global scientific publications. Bibliometrics analysis yields diverse and varied data. Scientific publications related to communication in social media about the COVID-19 vaccine produced in the last two years, from 2020 to 2021, have various points of view. This study analyzes and classifies data starting from the year of the document. The country that contributes the most to scientific publications, the source of the journal, the type of document, the subject area, the author, the institutions output and the document affiliation.

The Global Publication years, scientific publications of research related to communication in social media about COVID-19 vaccine from 2020 to 2021 in the Scopus database as many as 99 publications. The emergence of this research cannot be separated from the emergence of the COVID-19 pandemic that hit the world. More than that, in some countries, even the COVID-19 pandemic has not yet ended its spread. The COVID-19 vaccine is one of the efforts that scientists have put forward to overcome this pandemic. Then, the initial form of government in various countries disseminating information and communication to their citizens so that they know about vaccines is by using social media.

However, several studies take their respective perspectives in using social media for the COVID-19 vaccine. From a positive point of view and a social media point of view, it is used to reject vaccines because they are considered dangerous. A social media movement aimed at undermining vaccine credibility and persuading people to disregard government and health agency immunization recommendations. The antivaccine movement and its principles heavily influence the COVID-19 negationist movement. In the fight against disinformation, a new topic in social media about COVID-19 vaccination hoaxes must be against (Herrera-Peco et al., 2021). From 2020 to 2021, there has been a significant increase in the publication of scientific research related to communication in social media about vaccines. In 2020 there were 23 scientific research publications, while in 2021, it increased to 76 scientific research publications. This can be seen from the emergence and continued information related to the COVID-19 vaccine at the

end of 2020. Several vaccines currently used in various countries began to be used in late 2020 and early 2021. The use of COVID-19 vaccines is indeed intensively informed to the public, aim for all want to use it.

In the case of Indonesia, the government's public communication management has proven ineffective due to the diversified and uneven broadcast of public information. At the same time, the government should provide consistent and accurate information to the public. This can be done by monitoring and supervising the mass media, electronics and using social media and online media to provide accurate information and disseminate positive and educational content(Herman, 2021). The use of social media is indeed quite significant in this day and age. This is inextricably linked to the introduction and quick growth of social media platforms such as Twitter, Facebook, and others around the world. Social media has grown increasingly significant for individuals in a variety of industries, including business, education, and everyday life, in recent years. Evidence is mounting that social media is fundamentally altering how people connect, consume, and collaborate(Gan & Wang, 2015).

Especially in Indonesia, taking data from We Are Social and the Association of Indonesian Internet Service Providers that the number of internet users in Indonesia reaches more than 200 million people or about 73.7% of the total population and active social media users are 191.4 million (Kemp, 2022). So that in the context of the spread of health communication about vaccines in Indonesia, its use is very important. Because the majority of Indonesian people use the internet or the digital world especially social media to access everything, including health information of course.

Contributions of countries, with ten countries contributing the most to the global scientific publications related to communication in social media about the COVID-19 vaccine from 2020 to 2021. Figure 2 shows in detail these countries.

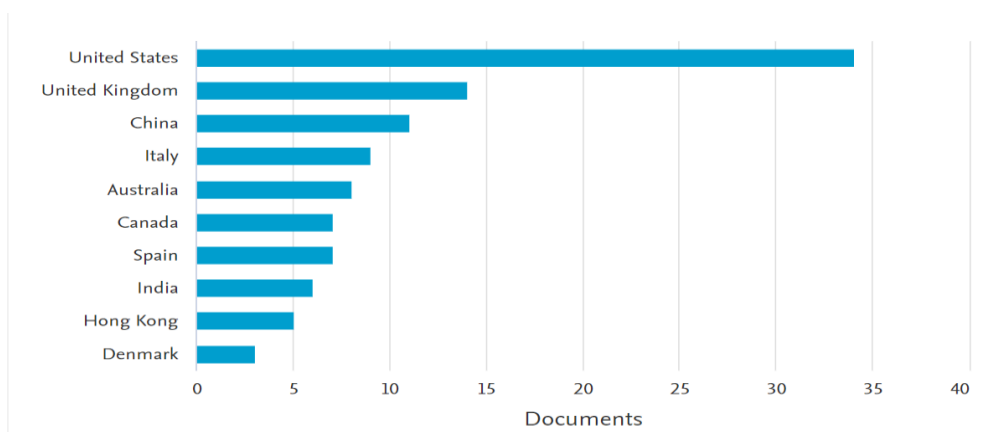


Figure 2. The document by country

Source: Scopus Database

Figure 2 shows the top 10 countries that contribute to research publications related to communication in social media about the COVID-19 vaccine. The United States became the country that contributed the most by having 34 documents. Followed by the United Kingdom, which has 14 documents, then China with 11 documents, and Italy with nine documents. Furthermore, Australia has eight documents. Canada and Spain each contributed seven documents. India with six documents, Hong Kong with five documents, and Denmark with three documents.

Based on the data in figure 2, it also shows that there are three countries from Asia that have the highest contribution to Scopus indexed scientific publications, namely China, India and Hong Kong. The reasons for the emergence of these three countries in the list are quite reasonable. China is the country of origin of COVID-19, so discussions about all kinds of things related to this virus are very intense. China's positive confirmed cases of COVID-19 as of April 2, 2022 from JHU CSSE COVID-19 Data and Our World in Data stated that as many as 693 thousand and 4,655 cases died. Even China is also making COVID-19 vaccines, namely Sinovac, Sinopharm, and CanSino (CNNIndonesia, 2020). Therefore, scientific research published in various Scopus indexed journals related to the topic of using social media as a means of spreading COVID-19 is quite high compared to other Asian countries. Then, the country of India is also struggling in the fight against the COVID-19 pandemic in the midst of its economy which is no better than Indonesia. According to data from Worldometers, Thursday (21/4/2022), India has reported 43 million cases of COVID-19 with more than 500 thousand deaths since the start of the pandemic (Miranti, 2022). This shows that India is struggling to overcome the COVID-19 pandemic. So that research related to vaccines is very rational to do, as well as those related to the use of social media as a means of spreading communication.

Likewise with the country of Hong Kong which is battling COVID-19. Research on the spread of vaccines through social media as a fairly massive means of communication can be seen at least from the Scopus indexed data. shows that Hong Kong is working to resolve the COVID-19 pandemic in its country. Hong Kong is a country in Asia that is quite concerned about COVID 19, because this country has close relations with China. Hong Kong is also known as mainland China. Moreover, positive confirmed cases of COVID 19 in Hong Kong are also very high. data from JHU CSSE COVID-19 states that positive confirmation of Hong Kong from the beginning of the pandemic until April 2, 2022 reached 1.2 million and 9186 cases died (Arbar, 2022). These data have shown that Hong Kong is one of the Asian countries that has been severely affected by COVID-19.

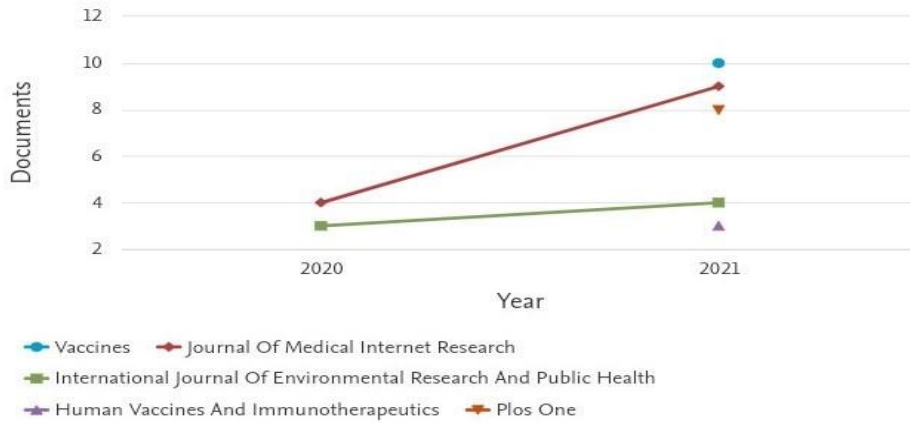


Figure 3. The document by source

Source: Scopus Database

Figure 3 shows several sources of scientific research publications related to the theme of communication in social media about the COVID-19 vaccine. Of course, the source of this scientific publication is the Scopus index, which then publishes and discusses a lot about the theme. Journal of Medical Internet Research became the source of the most publications with thirteen documents, followed by Vaccines which had ten documents. Followed by Plos One with eight documents, the International Journal of Environmental Research and Public Health has seven documents. Then, Human Vaccines And Immunotherapeutics with three documents, Jmir Public Health And Surveillance with three documents. The vaccine has three documents, and finally, BMC Public Health has three scientific research publication documents related to the theme of communication in social media about the COVID-19 vaccine. Author analysis, publications of scientific research from the Scopus database related to communication in social media about the COVID-19 vaccine as many as 99 documents were written by many researchers. Herrera-pecco I. and Jimenez-Gomez, B. is the author who has the highest contribution, with each having three documents. Then, Alperstein, n has two documents, Ashkenazi, S. as many as two documents, Barnett, D.J. a total of two documents. Furthermore, Benis A. has two documents, Benitez De Gracia, E. two documents, Goldberg, B. two documents, Guntuku, S.C. as many as two documents, and Hughes, C. as many as two documents.

The first research document written by Herrera-Pecco I. is entitled "Antivaccine Movement and COVID-19 Negationism: A Content Analysis of Spanish-Written Messages on Twitter". This study was published in the Scopus indexed journal Vaccines. This research examines a COVID-19 anti-vaccination message campaign on Twitter that employs Spanish as its major language in order to determine the most important aspects of their communication

approach (Cobo et al., 2011). The second research title Healthcare Professionals' Role in Social Media Public Health Campaigns: Analysis of the Spanish Pro Vaccination Campaign on Twitter. This research was published in the journal Healthcare. His research examines the role that healthcare professionals play on Twitter in supporting public-sector vaccination campaigns against COVID-19 (Herrera-Peco et al., 2021).

Institution output, several institutions that contribute to the publication of scientific research come from various corners of the world. Figure 4 shows several institutions in various parts of the world that contribute to scientific research on social media communication about the COVID-19 vaccine.

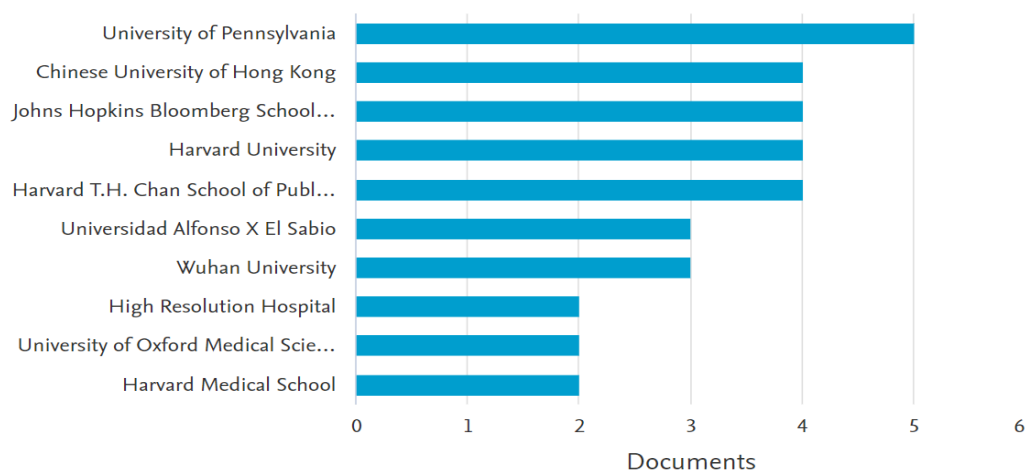


Figure 4. The document by institution

Source: Scopus Database

Figure 4 shows the top ten institutions contributing to scientific research related to communication in social media about the COVID-19 vaccine. The University of Pennsylvania was the most contributing by having five documents. Then, the Chinese University of Hong Kong, John Hopkins Bloomberg School, Harvard University, and Harvard T.H. Chan School of Publication have four documents each. Furthermore, Universidad Alfonso X El Sabio and Wuhan University each have three documents. Finally, Hight Resolution Hospital, University of Oxford Medial Science, and Harvard Medical School have two documents.

Mapping: Co-occurrences and Narrative Analysis

The co-occurrence analysis is used to identify research directions and popular themes, and it has proven to help track the progress of research programs and science(Gao et al., 2017). This study used the minimum number of keyword occurrences five times in all included research

publications analyzed using the VOSViewer. Figure 5 shows 104 identified keywords that can be classified into five clusters.

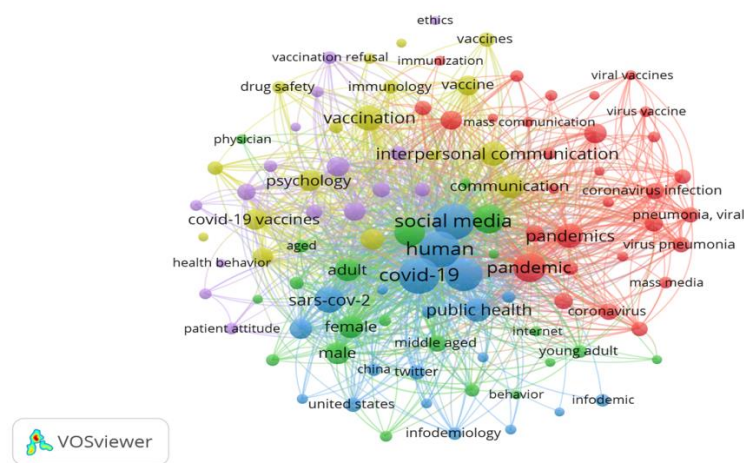


Figure 5. Co-occurrence of keywords

Source: Processed by the author with VOSviewer Software

Colors indicate clusters, whereas figure labels show keywords or terms that appear frequently. Clustering is used to acquire insight or description of bibliometric grouping, whereas image mapping is used to get a thorough picture of a bibliometric network (Prastya, Misran, & Nurmandi, 2021). Cluster 1: Anti-vaccination movement, betacoronavirus, coronavirus, coronavirus infection, COVID-19 vaccine, demography, economic aspect, epidemic, health care personnel, health communication, health education, health literacy, immunization, mass communication, mass media, mass medium, medical information, misinformation, pandemic, vaccine hesitancy, viral vaccines, virus, pneumonia, virus vaccine.

Cluster 2: Adolescent, adult, aged, behavior, behavior change, controlled study, coronavirus disease 2019, infection risk, internet, middle age, average human, physician, social distancing, virology. Cluster 3: China, COVID-19, epidemiology, government, health care policy, human, infodemic, infodemiology, infoveillance, isolation and purifications, natural language process, politics, public health, public opinion, quarantine, sars-cov-2, social media, Twitter, united states. Cluster 4: Communication, COVID-19 Vaccines, decision making, disinformation, education, immunology, interpersonal communication, psychology, sars-cov-2 vaccine, trust, vaccination, vaccines. Cluster 5: Attitude to health, health behavioral, health knowledge, influenza vaccine, information dissemination, vaccination refusal.

Cluster 3 keywords have a high number of occurrences and a high total link strength. Human said there were 75 occurrences, COVID-19 had 76 occurrences, and social media had

Figure 6 shows the level of saturation indicated by the many keywords that often appear in red surrounding the labels pandemics, misinformation, and viral pneumonia. Then, the blue color surrounding the labels social media, human, COVID-19, and public health. This area is a topic that has been widely researched. It is different from the topics covered in yellow, such as interpersonal communication, vaccination, vaccine, immunology, and COVID-19 vaccines. It shows this latter topic has not been researched much. Therefore, the opportunity to research the latter topic is still comprehensive.

In addition to VOSViewer, the NVIVO 12 Plus software was used to analyze 99 document publications. On the NVIVO 12 plus in analyzing using the word frequency analysis feature. It aims to display the narrative built-in scientific research publications related to communication in social media about vaccines from 2020 to 2021. Figure 7 displays narratives that often appear in 99 research documents related to communication in social media about COVID-19 vaccines.



Figure 7. Narrative global research related communication in social media about COVID-19 vaccine.

Source: Processed by the author with NVIVO 12 Plus Software

Figure 7 shows that 99 scientific research publication documents related to communication in social media about the COVID-19 vaccine discuss COVID-19 and vaccines. This can be seen from the emergence of the words COVID-19, health, vaccine, Vaccines, Vaccination, pandemic. One of his research that discusses COVID-19 and vaccines is a study entitled "COVID-19 Vaccination Hesitancy in the United States: A Rapid National Assessment". In this study, a community-based sample of the adult population in the United States is used to conduct a complete and systematic nationwide assessment of COVID-19

vaccination reluctance (Khubchandani et al., 2021). Another study entitled "COVID-19: vaccination in a developing country". This study explains that the responsibility is not only owned by the government in communicating vaccines to the public. But also the role of all parties, both doctors and medical students, who are reliable in this field. Of course, with the right communication strategy, this aims to reduce doubts about the COVID-19 (Gutiérrez-Zevallos & Espiritu-Martínez, 2021).

Ninety-nine scientific research publications about communication in social media about vaccines also discuss social media used as a means of communication and information. This can be seen in the emergence of social media, information, communication, Twitter, and others. Based on this, it shows that 99 scientific research publication documents link the COVID-19 vaccine with the use of social media both as an introduction to information and as a means of communication. More than that, it is natural that this topic will be discussed in the communication in social media research about the COVID-19 vaccine from 2020 to 2021.

Conclusion

This study concludes that the global research trends related to the use of social media as a means of distributing COVID-19 vaccines, both positive and negative, from 2020 to 2021 are increasing in interest. This is inseparable from the fact that the COVID-19 vaccine is a new thing all over the world. The country that contributes the most to scientific publications on related topics is the United States. This answers the mapping that it is not the country of origin of COVID-19 that contributes the most in scientific publications, but other countries that in fact have competition in all fields. Likewise, it is strengthened by the institution that has the most high contribution in scientific publications, namely The University of Pennsylvania which incidentally is in the United States. The bibliometrics analysis also found that the Journal of Medical Internet Research is the journal that publishes the most research related to communication on social media about the COVID-19 vaccine.

Furthermore, mapping related to the theme of communication on social media about the COVID-19 vaccine cannot be separated from discussions about humans, COVID-19, and social media. more than that, answers related to research topics that have the opportunity to be investigated further are interpersonal, vaccination, vaccines, immunology, and COVID-19 vaccines. This is because there is still little research that takes the theme of the discussion. The narrative of global scientific research publications related to communication in social media about the COVID-19 vaccine is COVID-19, vaccine, and social media. Although this study succeeded in explaining global research trends related to communication in social media about

the COVID-19 vaccine, this study has limitations in terms of data sources. This is because the data source used only comes from the Scopus database. Therefore, recommendations for further research need to use data sources from the web of science as a source of other global research databases.

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