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The Work Place Initiative: Health, Safety and Wellbeing Regarding COVID-19

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THE 3rd SRIWIJAYA INTERNATIONAL CONFERENCE ON PUBLIC HEALTH

The Work Place Initiative: Health, Safety and Wellbeing Regarding COVID-19

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PREFACE

On behalf of the organizing committee, I am delighted to welcome you to the 3nd Sriwijaya International Conference on public Health (SICPH 2021) during 21th october 2021 at Palembang South Sumatera, Indonesia. The SICPH 2021 is international conference organized by Faculty of Public Health, Sriwijaya University (UNSRI). I would like to extend my warmest welcome to all the participant of The SICPH 2021 under the theme ***"The Impact of Climate Change on Infectious Disease Transmission".***

The SICPH 2021 consists of keynote sessions from well known expert speakers in the field of public health, and academic paper sessions (oral presentations) who are coming from several region. This conference seeks to bring together academics, public health professionals, researchers, scientists, students and health stakeholders from a wide range of disciplines to present their latest research experience and further development in all areas of public health. We hoped that this conference will be usefull platform for researchers to present their finding in the areas on multidisciplinary realted to public health and health system issues.

This conference will provide opportunities to exchange ideas, knowledge, and development of the latest research among the participants. We will publish the paper as output from the SICPH 2021 in proceeding book with ISBN and selected paper will be published in Jurnal ilmu kesehatan masyarakat- SINTA 3 (a nationally-accredited journal). The SICPH 2021 is being attended by about 50 participants. I hope you enjoy the conference.

With regard to considerable conference agenda, we greatly appreciate any support and sponshorship derived from any govermental as well as private institutions for the success of the conference. Great appreciation is also handed to organizing committe of the conference for any voluntarily effort that bring to the succes of the conference.

The conference committee expresses its gratitude towards all the keynote speakers, authors, reviewers, and participanst for the great contribution to enssure the succes of this event. Finnally, I sincerely thank all the members of the organizing committee who have worked hard to prepare this conference.

Palembang, October 2021

Chair,

Anita Camelia, SKM., MKKK.

PREFACE

First of all, let us thank God, the Almighty, who has given His grace and guidance so that the 3rd Sriwijaya International Conference of Public Health (SICPH) with the theme of The Workplace Initiative: Health, Safety and Wellbeing Regarding Covid:19 can be held successfully. I welcome all of you to this seminar which has received great attention not only from university, but also other communities to submit papers to be presented in this seminar. I express my highest gratitude and appreciation the presenters.

The conference is divided in two session, the first session is speeches and the second session is round table discussion. In the first session, the invited keynote speakers were Prof. Dr. Tan Malaka, MOH, DrPH, SpOk, HIU (A Professor from Medical Faculty Universitas Sriwijaya), Prof. Dr. Retneswari Masilamani (University Tunku Abdul Rahman, Malaysia), Prof.Dr.Joselito L. Gapaz MD, M.PH(University of the Philippines) and Prof. Dr Tjandra Yoga Aditama, MHA,DTM&H, DTCE,SpP(C).FIRS (Professor from Griffith University, Australia)

Of course, this conference activity would not have succeeded without the support of all parties involved, as well as the presence of all participants in all regions in Indonesia and internationally. I especially thank to all the organizing committees for their hard work, perseverance, and patience in preparing and organizing this conference so that it can go well, smoothly and successfully.

Finally, through this conference let us extend the network and cooperation among all stakeholders of the public health sector, especially in Indonesia and in the world in general, to build a better public health world in Indonesia

Thank you for participating in this conference.

Dean of Public Health Faculty,

Universitas Sriwijaya

Dr. Misnaniarti, S.K.M, M.K.M

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Desi Mawarni [1], Iza Netiasa haris [2], Rizka Dwi Patriawati [3], Mutiara Tri Florettira [4], Clarisya Resky Vania [5], Rizma Adlia Syakurah [6*]

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ABSTRACT

The COVID-19 pandemic is a continuing problem around the world. Efforts to handle and prevent COVID-19 infection are carried out by examining a number of available drugs such as Chloroquine, Eucalyptus (Eucalyptus globulus Labill) and also vaccine development. This study aims to analyze the community's response to the treatment and prevention of COVID-19 through Google trends. Keyword searches for "Corona Vaccine", "Chloroquine" and "Eucalyptus" through Google trends were carried out between 1 March - 3 September 2020. The data were then analyzed with Pearson's correlation test was carried out on the number of new COVID-19 cases with p < 0.05. There is a relationship between the search for the corona and chloroquine vaccines with new cases due to COVID-19 (p <0.001). Google trends can be used as a tool to monitor public worried about the COVID-19 pandemic situation in Indonesia and help maximize risk communication by the government.

Keywords: *Google trends, chloroquine, eucalyptus, COVID-19 vaccine, Indonesia*

ABSTRAK

Pandemi COVID-19 adalah masalah yang terus berlanjut di seluruh dunia. Upaya penanganan dan pencegahan infeksi COVID-19 dilakukan dengan memeriksa sejumlah obat yang tersedia seperti Chloroquine, Eucalyptus (Eucalyptus globulus Labill) dan juga pengembangan vaksin. Penelitian ini bertujuan untuk menganalisis respon masyarakat terhadap pengobatan dan pencegahan COVID-19 melalui Google Trends. Pencarian kata kunci “Vaksin Corona”, “Klorokuin” dan “Eucalyptus” melalui Google Trends dilakukan antara 1 Maret – 3 September 2020. Data tersebut kemudian dianalisis dengan uji korelasi Pearson terhadap jumlah kasus baru COVID-19 dengan p<0,05. Ada hubungan antara pencarian vaksin corona dan klorokuin dengan kasus baru akibat COVID-19 (p<0,001). Google Trends dapat digunakan sebagai alat untuk memantau kekhawatiran publik tentang situasi pandemi COVID-19 di Indonesia dan membantu memaksimalkan komunikasi risiko oleh pemerintah.

Kata kunci: *Google trend, chloroquine, eucalyptus,* vaksin COVID-19, Indonesia

Introduction

On March 11, 2020, World Health Organization (WHO) has officially declared Corona Virus Disease 2019 (COVID-19), which caused an outbreak of an infectious respiratory disease in Wuhan, China at the end of December 2019, as a pandemic.[1] To 6 May 2020, The COVID-19 Pandemic is an ongoing problem in more than 200 countries with more than three million confirmed cases worldwide. In Indonesia, COVID-19 has caused 12,438 people to be infected and 895 deaths related to the disease. *Indonesia's case fatality rate* (CFR) is also much higher (7.2%) compared to the rest of the world (6.9%) and the Southeast Asia region (3.7%).[2]

In response to the high number of COVID-19 cases and deaths, various countries have taken measures to treat and prevent COVID-19 infection, but no specific antiviral recommended for COVID-19 has been found and an adequate vaccine is not available. Changing some of the currently available drugs to be one of the fastest ways to provide treatment for patients, Chloroquine and its derivative Hydroxychloroquine have been shown to have activity against severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) in vitro.[3] Some researchers support traditional treatments such as Eucalyptus (*Eucalyptus globulus Labill*) or its essential oils to slow the spread while waiting for vaccines to be introduced but should follow modern medicine guidelines in patient care.[4] Vaccine development by various agencies demonstrates the use of various technological platforms for COVID-19, including the use of nucleic acids including DNA and RNA, virus-like particles, peptides, viral vectors (replicating and non-replicating), recombinant proteins, and viral approaches that attenuated and inactivated viruses. In Indonesia, the progress of vaccine development is in the phase of producing protein in mammalian cell culture after successfully isolating antigenic genetic material from viruses.[5]

The use of the internet as a source of information on health services is increasingly being carried out. Infodemiology and *infoveillance* are public health information methods used to analyze Internet search habits.[6] One of the tools that can be used to facilitate researchers in obtaining internet search data is *Google trends*, an online portal that can be freely accessed anywhere.[7]

Based on this background, researchers are interested in using data of Google trends to monitor the response of the Indonesian people in searching for data regarding COVID-19 during this pandemic, so it's expected to potentially as an early warning system and a tool for monitoring public reactions regarding COVID-19 treatment and prevention measures in Indonesia.

Method

Search trends with keywords about information about COVID-19 treatment circulating in Indonesia using Google trends (GT) (https://trends.google.com/trends) from March 1 to September 3, 2020. The keyword chosen is "Corona Vaccine". ", "Chloroquine" and "Eucalyptus". Then the association of each spike that occurs is carried out and analyzed. This search term is used to assess the curiosity of the people in Indonesia whether it is preventive (preventive) or therapeutic (drug) based. Google trends presents relative search volume (RSV) and the data is adjusted according to time and location, so that comparison between questions can be easier. The results can be downloaded in format common separated values (CSV), which is displayed on a scale from 100 to highest attention on keywords to 0 for lowest attention on keywords. Data from GT is then compared with the number of new COVID-19 cases collected from the official website of the task force for the acceleration of COVID-19 handling in Indonesia (www.covid19.go.id).[8.9] Moving averages with three-day intervals of GT data and the number of COVID-19 cases are entered into the graph to assess search movement patterns. This moving average is used to facilitate comparison of GT trends against the dataset. The time-lag correlation was used to assess whether the increase in GT data correlated with an increase in COVID-19 cases, as has been applied in other studies.[7.10]

Results

Keyword search patterns around information about COVID-19 treatment circulating in Indonesia, namely "Corona Vaccines", "Chloroquine" and "Eucalyptus" are shown in **Figure 1**. The search results show that from March 1 to September 3, 2020, the keyword search pattern fluctuated. There are several peaks that can be identified from each keyword.

Peak A is the first peak found, the keyword that has increased at this Peak is the keyword "Corona Vaccine". This increase did not last long and immediately decreased. The second peak of the increase in the search for the keyword "Coronavirus" was peak B which occurred on March 19, 2020. This peak only lasted 1 day which then immediately dropped down, but increased again on March 25, 2020. Peak C was the peak of the word "Chlorcoquine" key that occurred on March 21, 2020.

On May 10, 2020, there was an increase in searches for the keyword "*Eucalyptus*" (Peak D). The increase in keyword searches did not last long, until there was another increase on May 19, 2020 (Peak E). The increase in searches for the keyword "Coronavirus" again occurred on June 17, 2020 (Peak F),

although not as high as the peak search for that keyword on March 19, 2020. The “Eucalyptus” search increase occurred again on July 6, 2020 (Peak G). The peak of the search for "Corona Vaccine" increased again on July 21, 2020 (Peak H).

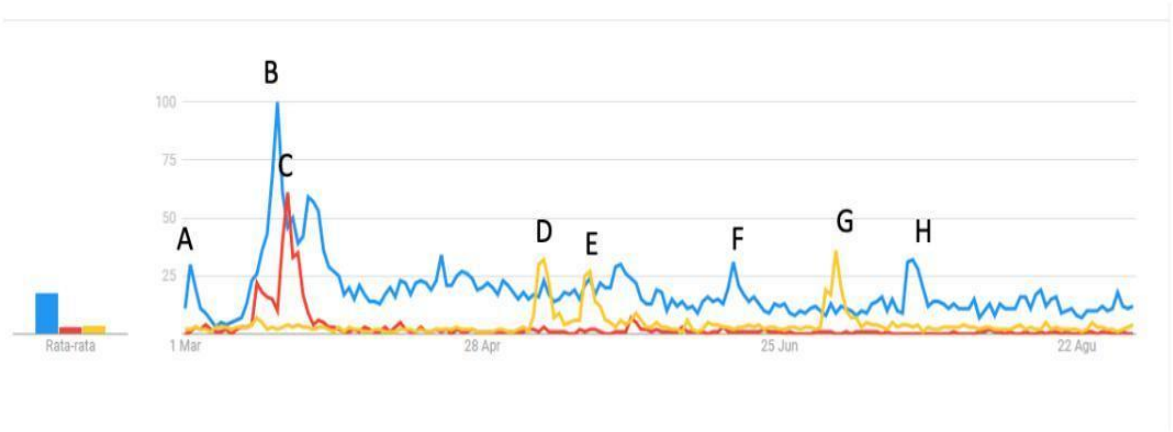

Figure 1. *Google trends* with the keywords “Corona vaccine”, “Chloroquine” and “Eucalyptus”

Queries related to the keywords *“*corona vaccine”, “chloroquine”, and “*eucalyptus*” are presented in **Table 1**. Related queries can describe the pattern of search habits in Indonesian society. The keyword "corona vaccine" on March 1 to September 3 is generally about the development of the corona vaccine. Meanwhile, the query related to the keyword “chloroquine” was dominated by the use of chloroquine and its relationship with the drug avigan. The disbursement of the keyword "*eucalyptus*" was mostly about products containing *eucalyptus*.

The distribution of cities in Indonesia with the highest searches according to the keywords "corona vaccine", "chloroquine", and "*eucalyptus*" from March 1 to September 3 can be seen in **Table 2**. Based ondata, it was *google trends* found that North Kalimantan was the city with the highest search for "corona vaccine", North Maluku with the highest search for "chloroquine", and South Kalimantan with thesearch for *"eucalyptus*highest" in Indonesia.

Table 1. Queries related to the keywords “corona vaccine”, “chloroquine”, and “eucalyptus” from March 1 to September 3 in Indonesia.

Vaccines corona	**Chloroquine**	***Eucalyptus***
vaccine covid	Drug corona	Plossa eucalyptus
vaccine covid 19	Chloroquine medicine corona	Necklace eucalyptus
Covid 19	Avigan and chloroquine	Eucalyptus medicinal corona
Update corona	Chloroquine price of	Eucalyptus coronavirus
Update vaccine corona	Drug avigan	benefits of eucalyptus oil
news vaccine corona	Prices drug chloroquine	Eagle eucalyptus spray
Developmentsthe vaccine corona	side effects ofklorouin	eucalyptus oil
Inventors corona vaccines	avigan drugandchloroquine	spray Eucalyptus
vaccineCorona	chloroquinecovid	Eucalyptus oileucalyptus
vaccine trial corona	avigan what drugs	Eucalyptusare

in Indonesian Table 2. Cities with the highest search by keywords "vaccine corona", “chloroquine”, and “eucalyptus” from March 1 to September 3.

Corona Vaccine	**Chloroquine**	***Eucalyptus***
North Kalimantan North	Maluku	South Kalimantan
Aceh	Maluku	Maluku
West Sulawesi	Bangka Belitung Islands	Southeast Sulawesi West
Sumatra	Gorontalo	Bengkulu
Lampung	West	Papua West Papua
Jambi	North Sulawesi	Banten
Central Java	Southeast Sulawesi	North Maluku
West Nusa Tenggara	Central Kalimantan	DKI Jakarta
North Sumatra	Central Sulawesi	North Sulawesi
Riau Islands	East Kalimantan	West Sulawesi

Figure 2 shows a comparison of the number of new COVID-19 cases and interest in keyword searches related to the prevention and treatment of COVID-19 on March 1 to September 3, 2020. Based on graph 2, each keyword has a fluctuating peak . There were four peaks for the keyword “corona vaccine”, two for “chloroquine”, and three for “eucalyptus”. This increase is related to information provided by the government including the first case of COVID-19 in Indonesia, the increase in deaths

from COVID-19, the order for chloroquine by President Jokowi Dodo, the launch of a eucalyptus-based antiviral by the Ministry of Agriculture, and the development of a COVID-19 vaccine.

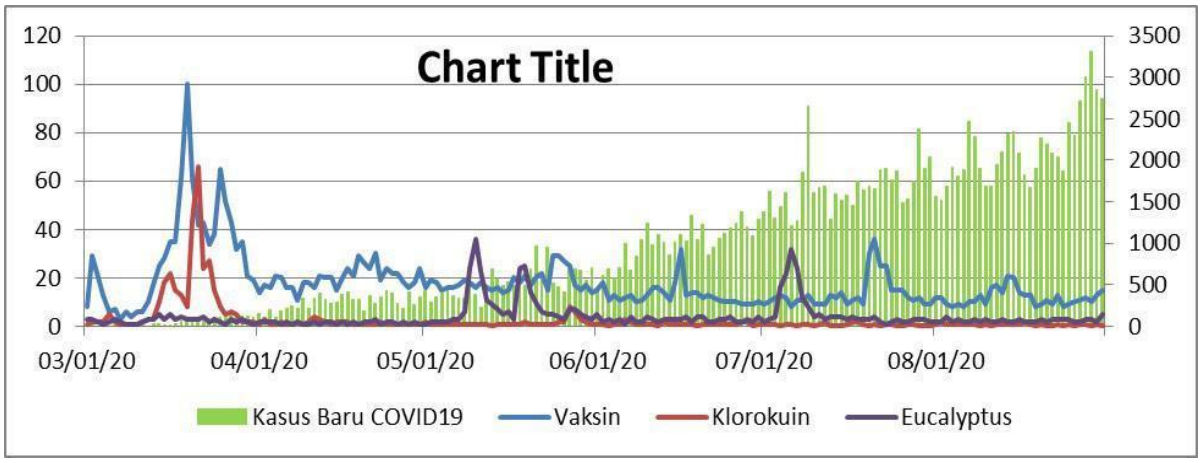

Figure 2. Comparison of GT Search Interests Using the Keywords "corona vaccine", "chloroquine", and "*eucalyptus*" with Data on New Cases of COVID-19 Infection in Indonesia from 1 March to 3 September 2020

Validation using the Pearson correlation showed significant correlation results (*p-value* < 0.05) betweendata for *google trends* corona vaccines, chloroquine andand *eucalyptus* new cases due to COVID-19 in Indonesia. These results indicate that there is a relationship between seeking a corona vaccine and chloroquine with new cases due to COVID-19, and there is no relationship between seeking *eucalyptus* with new cases of COVID-19 (**Table 3**). All data on the search for coronavirus and chloroquine vaccines have a significant negative correlation, which means that there will be an increase in searches for "Corona Vaccine" and "Chloroquine" in the one to three days before, and after, and on the day of decreasing COVID-19 cases.

Table 3. Results of the time-lag correlation between keywords searchand the number of new COVID-19 cases in Indonesia.

	Keyword Search					
Time-	**CoronaVaccine**		**Chloroquine**		**Eucalyptus**	
lag	**R**	**p-value**	**R**	**p-value**	**R**	**p-value**
-3	-0.391	0.00	-0.279	0.00	0.080	0.278
-2	-0.386	0.00	-0.285	0.00	0.052	0.482
- 1	-0.393	0.00	-0.287	0.00	0.007	0.929
0	-0.390	0.00	-0.290	0.00	-0.005	0.945
+1	-0.387	0.00	-0.293	0.00	-0.004	0.957
+2	-0.389	0.00	- 0.293	0.00	-0.005	0.950
					- 0.005time.1	
+3	-0.388	0.00	-0.293	0.00	0	0.946

Significant p<0.05

Discussion

Google Trend is search statistic *web*- based that displays popular search topics in a certain time. Based on the analysis, the data GT RSV regarding keywords related to treatment and prevention during a pandemic, such as "Corona Vaccines", "Chloroquine" and "Eucalyptus" in Indonesia can monitor the reaction of the population in Indonesia to the COVID-19 pandemic. The search for the keyword 'Corona vaccine' has fluctuated during the search period. The peak of this keyword search coincided with the announcement of the first confirmed case of COVID-19 in Indonesia by the President of the Republic of Indonesia, Joko Widodo.[11] Meanwhile, the second peak of "Corona Vaccine", allegedly because there was a sharp increase in cases of death by COVID-19 on the previous day, namely as many as 14 deaths from the previous 3 days there were no reported cases of death based on data from the Task Force for the Acceleration of Handling COVID-19 in Indonesia.[12] The increase in the third peak coincided with the government announcing that there were 150 positive COVID-19 cases, bringing the total to 790 positive cases.[12] The fourth and fifth peaks of the keyword “Corona Vaccine” are allegedly related to the news about the success of phase 1/2 of the development of the COVID-19 vaccine by Sinopharm, a Chinese government company[13] and the news that 24 candidates have entered the clinical trial stage.[14]

The peak of the keyword “Chlorcoquine” is thought to coincide with the news about the President of the Republic of Indonesia ordering millions of chloroquine drugs for the treatment of COVID-19 in Indonesia.[15] While the highlight of the keyword "*Eucalyptus" is* suspected to be the impact of the launch of-based antiviral innovation *eucalyptus* by the Ministry of Agriculture (Kementan) in the Main *Agriculture War Room* (AWR), Jakarta on May 8, 2020[16], a statement from the Head of Balitbangtan which concluded that the active ingredient is *eucalyptus* can kill the virus that causes COVID-19[17] and reports that the Ministry of Agriculture (Kementan) is preparing to produce-based antivirals *eucalyptus* packaged in necklaces.[18]

The search pattern regarding Covid-19 which is represented using the *keyword* corona in Indonesia shows that the search in the community is very important depending on the news in the media and a momentum of events related to the situation in Indonesia, not because of the behavior of people who want to find out about Covid-19. This can be seen from the many peaks that dip sharply and immediately decline.

Related queries can describe the pattern of search habits in Indonesian society. The keyword "corona vaccine" on March 1 to September 3 is generally about the development of the corona vaccine. This is in line with the public's curiosity about vaccine developments after being informed to the public about the beginning of vaccine development in mid-March.[19] Meanwhile, the query related to the keyword “chloroquine” was dominated by the use of chloroquine and its relationship to the drug avigan. This is related to the announcement of an order for chloroquine along with avigan by President Jokowi Dodo.[15] [The] disclaimer regarding the keyword “*eucalyptus*” was mostly about products containing *eucalyptus*. This implies that the amount of information in the media theproduct *eucalyptus* after first announced by the Ministry of Agriculture[16] affect search patterns in Indonesian society.

Based on the comparison of the number of new cases of COVID-19 and Interested in searching keywords related to the prevention and treatment of COVID-19, the keyword "corona vaccine" is the most searched for the prevention and treatment of COVID-19 compared to other keywords, namely "chloroquine" and "*eucalyptus"*. These results indicate that the interest of the Indonesian people in seeking information is more likely to develop long-term preventive measures than curative measures which are described by the keyword "chloroquine" and short-term preventive measures are described by the keywords "*eucalyptus"* which has not been scientifically proven to prevent COVID-19. 19. This result is similar to the pattern of public searches in the UK where “corona vaccine” is the most common keyword compared to “*chloroquine*” and “*eucalyptus*”.[20]

The high number of searches for information regarding the "corona vaccine" experienced an increased significantly on March 19, 2020. This was stimulated by a drastic increase in the number of deaths due to COVID-19, namely 14 deaths and the number of new cases of COVID-19 as many as 82 cases on March 19, 2020.[12] However , the search for the keyword "corona vaccine" has then decreased since entering April even though the number of new cases of COVID-19 infection began to increase in Indonesia. This is because on April 10, 2020, the Governor of DKI Jakarta Anies Baswedean began implementing Large-Scale Social Restrictions (PSBB) in Jakarta to reduce the number of cases of COVID-19 so that there began to be a slight shift in asking the public to seek information.[21,22] After that, the search for the keyword "corona vaccine is relatively constant along with the increase in new cases of COVID-19. This shows that the habit of seeking information in today's society is still looking for long-term prevention efforts against COVID-19.

This is different from the search for the keyword "Chloroquine" which experienced an increased significantly on March 21, 2020 after the news about the President of the Republic of Indonesia ordering millions of chloroquine drugs for the treatment of COVID-19 in Indonesia.[15] This condition has led to increased public interest in seeking treatment for COVID-19. However, the search for chloroquine, which initially increased significantly in mid-March 2020, then decreased to a point of 0 in line with the increase in new cases of COVID-19. This is influenced by many factors, including statements regarding the unproven effectiveness of chloroquine in treating COVID-19 on March 21, 2020.[23] The news has caused a shift in public interest in searching. From this, it can be seen that the public's search for information is influenced by government statements and the amount of information disseminated by the media. In addition, the increasing dissemination of information with other media such as youtube, whatsapp, instagram, and other media is also a factor causing the decline in searches.

The keyword searches of *"eucalyptus*" increased after the news of the Ministry of Agriculture (Kementan) which was preparing to produce eucalyptus-based antivirals packaged in necklaces on July 6, 2020.[16] This then triggered the public to seek information about *eucalyptus* and similar products containing *eucalyptus* as a precaution against COVID-19. This search then gradually decreased along with the increase in new cases of COVID-19 because *eucalyptus* has not been proven to be effective in preventing COVID-19.[24]

The existence of significance based on the results of the analysis indicates that google trends can be used as a tool to monitor public anxiety about the state of the COVID-19 pandemic in Indonesia within a period of 1-3 days before, after and when the decline in the number of cases occurs. Changes in

the behavior of the general public can be maximized by improvements in analyzing public unrest when an outbreak occurs, primarily helping to maximize *risk communication* by the government.[6.22] Therefore, the opportunity for an approach using *Google trends* as an early warning system and a monitoring tool for public reactions used to assist traditional surveillance systems so as to improve public health responses to the Covid-19 pandemic situation as found in previous studies is increasing.[25,26]

Conclusion

There is a relationship between the search for a “corona vaccine” and “chloroquine” with new cases due to COVID-19 and there will be an increase in the search for "Corona Vaccine" and "Chloroquine" one to three days before, and after, and on the day of the decline in COVID-19 cases. Google Trends can be used as a tool for monitor public anxiety about the state of the COVID-19 pandemic in Indonesia within a period of 1-3 days before, after and when the decline in the number of cases occurs. Changes in the behavior of the general public can be maximized by improvements in analyzing public unrest when an outbreak occurs, primarily helping to maximize risk communication by the government.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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