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## Online Information Seeking Behavior among Indonesian during the COVID-19 Pandemic

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### Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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### ABSTRACT

**Background:** The COVID-19 vaccination movement in Indonesia until mid-2021 has still not reached the expected number, which is less than 20% of the Indonesian population who receive the first dose of vaccine. Meanwhile, the government's target for accelerating herd immunity is to achieve immunization coverage of 70% by November 2021. Several issues have arisen regarding the public's reluctance to accept the COVID-19 vaccine, such as vaccine readiness, efficacy, conspiracy, halal issues, and the negative side of this vaccine.

**Aims:** This study aims to assess the online behavior of the Indonesian community in seeking information related to the COVID-19 vaccine.

**Methods:** Google trends was used as a data source to see the public interest in several issues including COVID, vaccines, and government policies.

**Analysis:** The analysis was carried out descriptively.

**Results:** The results of this study indicate the movement over time of society towards several terminologies in line with events or the implementation of policies in Indonesia.

**Conclusion:** This research contributes to surveillance of the public's information needs on the COVID-19 issue to avoid misinformation.

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## 1. INTRODUCTION

The development of information systems marked by the unstoppable flow of information through the internet is like a double-edged sword that cannot be avoided. On the one hand, it opens public discourse about information in various parts of the world; on the other hand, uncontrolled information dangers society itself. Fake news is a severe threat to all areas of life, including disease prevention, because it is a root for noise, anxiety, or even chaos in a population. Fake news spreads easily, quickly, massively, and widely along with the current development of social media. Millions of news are spread on social media every day, some of which are false and misleading that can influence people's behavior in taking action [1].

A person's behavior is influenced by the knowledge they have also prejudiced by the extent to which a person can access information from various sources [2,3]. Google is a popular search engine used by millions and even billions of the world's populations as a source of information. Numerous Google users make it possible to produce trend analysis to determine the tendency of disbursement of information by users in a particular place and time frame. So that, this trend is able to illustrate the curiosity of the community towards a specific issue, including health aspects [4]. Further, this can be a direction for related parties in planning preventive actions.

After more than one year of the COVID-19 pandemic, fake news has become a crucial issue to cope with because this fake news disrupts the ongoing health program to control this disease. Fake news also affects humanity [5,6]. In Indonesia, COVID-19 vaccination aimed to overcome the pandemic has not run effortlessly because of the many hoaxes circulating on the internet and social media. From March 2020 to January 2021, it was reported that more thousands of hoaxes were issued across the media [7]. This incident disrupts the stability of the process of achieving herd immunity. Considering the current situation, this research aimed to assess the online behavior of the Indonesian community in seeking information related to the COVID-19 vaccine. This research contributes to the COVID-19 pandemic response by related stakeholders in Indonesia to increase the COVID-19 vaccination coverage.

## 2. MATERIALS AND METHODS

This research was led by a research question "how is the online behavior of the community in seeking information related to the COVID-19 vaccine?" We used Google Trends to see the people's online interest that was executed on July 9, 2021. We compare some keywords to see the differences in interest among the people include the term about vaccination procedure, vaccine brand interest and Indonesian government policy. Since we assessed people in Indonesia, so we used Bahasa Indonesia on setting the keyword.

We conducted our research through some steps using spatial aspect (Indonesia) and time set up to (Jan 1, 2020 – July 9, 2021), all categories, and web search. The first step, we examined some keywords to see the people interest related COVID-19 that will use in the next phase: "covid," "corona," "covid-19", "covid19", "covid 19". When the most interest keywords were identified, we used it to conduct the next stages. In the second stage, we examined the term "vaksin covid" and "vaksin corona" to see the interest term related to the COVID-19 vaccine. In the third stage, we started to answer the research question with tested the term "vaksin Sinovac," "vaksin AstraZeneca," "vaksin Sinopharm," "vaksin Moderna," and "vaksin Pfizer." In the last stage, we examined some terms related to Indonesian government policy such as "lockdown," "karantina wilayah," "PSBB" and "PPKM."

## 3. RESULTS

### 3.1 Screening for the "COVID-19" Term Interest

Our first screening shows that at the beginning of the global pandemic, people in Indonesia was interested to search by using term "corona." While after the Indonesian government confirmed that COVID-19 has found for the first time in Indonesia (March 2020), the term interest shifted to COVID and remain lead until July 2021 (Fig. 1). This pattern persisted until the time this data was collected.

Fig. 2 illustrates the interest in COVID-19 by provinces in Indonesia. The saturation of the red color indicates interest for corona while blue for covid. Most of people in Sumatera, Borneo, Java and Papua Island used corona term when they browsing in Google.

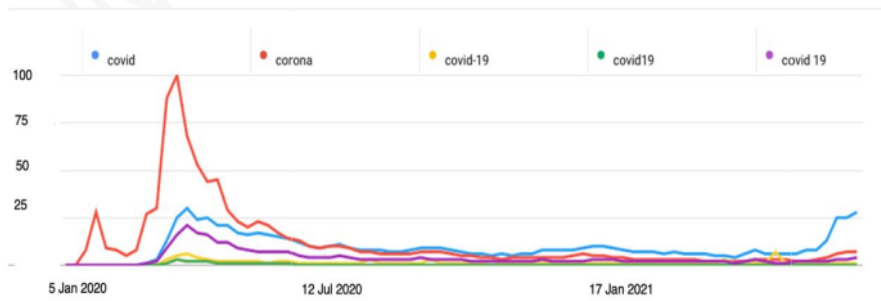


Fig. 1. Term interest comparison for COVID-19



Fig. 2. Detailed comparison based on province

### 3.2 Screening for the “Vaccine” Term Interest

Following the first screening, we tested the interest term related to the COVID-19 vaccine

and the result as shown in Fig. 3. People tend to search with term "vaksin covid" compared with "vaksin corona." The frequency of research was increasing since January 2021, when the COVID-19 vaccine was shot in Indonesia.

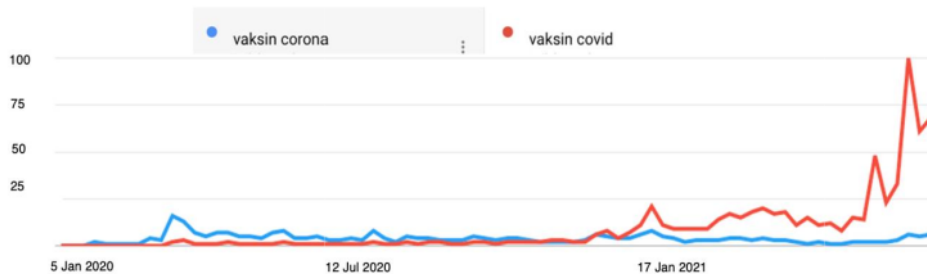


Fig. 3. Term interest comparison for COVID-19 vaccine

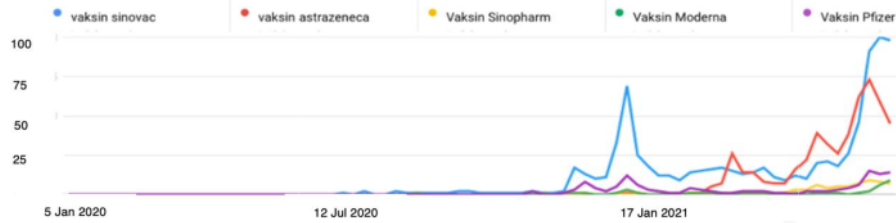


Fig. 4. Term interest comparison for COVID-19 vaccine brand

### 3.3 People Interest Related to Vaccine Brand

Fig. 4 shows that started from January 2021, the search term interest of Indonesia was about the types of vaccines from various brands. In January 2021, Sinovac dominated the interest which was the peak occurred in January 17, 2021. While in March 2021, AstraZeneca appeared higher interest, followed by Sinovac.

### 3.4 People Interest Related to Government Policy

Lastly, we compared four terms to see people's interests related to Indonesia's government policy. We test "lockdown" and "karantina wilayah" meaning the regional quarantine and "PSBB" or large-scale social restrictions and "PPKM" or Enforcement of Restrictions on Community Activities. Fig. 5 shows that lockdown was the majority of the search term at the beginning of the global pandemic. In some weeks after the COVID-19 declaration in Indonesia, the interest term shifted to PSBB. Then in July 2021, the search activity was moving to PPKM as this policy has just been introduced in the second wave of COVID-19 in Indonesia.

## 4. DISCUSSION

This work aimed to assess the online behavior in seeking information related to the COVID-19 vaccine among Indonesian society. Studying online people's behavior during a health crisis is essential to understand what information people need to learn about the disease for reducing their adverse effects such as anxiety [8]. The reluctance of some groups to get the vaccination is a barrier for the government to speed up the country's recovery from this pandemic. This research contributes to the COVID-19 pandemic response by related stakeholders in Indonesia to increase the COVID-19 vaccination coverage by providing suitable information.

Our result shows that at the beginning of the pandemic in Indonesia, people tried to adapt the situation with searched about Corona disease to gain knowledge about COVID-19 and also to reducing their anxiety. Previous studies conducted on the effect of Covid-19 pandemic have showed that it has some psychological and mental disorder such as stress and anxiety [9-13]. It is understandable because COVID-19 was just discovered for the first time and there was no evidence yet related to this disease and how to prevent it.



Fig. 5. Term interest comparison for the type of government policy

Indonesia started the COVID-19 vaccination in January 2021[14]. When first introduced, the COVID-19 vaccine received a pro and contra response [15,16]. This was related to various issues such as vaccine readiness, efficacy, conspiracy, halal issues and its negative side of this vaccine [17-19]. This was exacerbated by the circulation of fake news or hoaxes through various platforms in Indonesia, thus making some groups hesitant, indolent, and even refusing to receive COVID-19 vaccinations [20,21]. Our result showed that along with the occurrence of the second wave of COVID-19 in Indonesia, where daily cases are increasing rapidly due to the new Delta variant, it can be seen that public interest was rising sharply to know about COVID-19 vaccination. This aligns with the health authorities' drive that the Delta variant is more infectious and the vaccine can relieve symptoms and avoid hospitalization [22,23].

The community's high interest regarding vaccination was followed by interest in the type/brand of vaccine provided in Indonesia. Among the five brands of vaccines that was introduced globally, Sinovac received a lot of interest because this was the first vaccine to be introduced and used in this Indonesia. Prior to that time, Indonesia was famous as one of clinical trial phase-3 of Sinovac vaccine [24], perhaps that was the reason why information about Sinovac become popular in the society. After some period from January 2021, AstraZeneca began to gain popularity. This was because of the various controversies accompanying this brand, such as the safety issue [25].

The online behavior of the community was a form of responsiveness to a particular problem, and tried to find answer to their curiosity. Various issues and news distributed online through multiple media among the public related to vaccines produced both positive and negative responses. This also affects their trust in the Indonesian government in handling COVID-19 by observed the government's policy and the effectiveness of the prevention action during the COVID-19 pandemic [26]. Most of society monitors government action through online media. At the beginning of 2020, the term lockdown receiving high interest from people was influenced by global impact and its implementation in neighboring, even though the Indonesian government did not enforce this policy.

This is because these terms were new and there were provisions that not everyone recognizes. So, the trend shifted to PSBB (large-scale social restrictions) dominated the people's interest, along with enacting this policy. The term lockdown received high interest was influenced by global terms and the impact of the implementation of lockdowns in neighboring countries, such as the Movement Control Order (MCO) in Malaysia [27] and the COVID-19 Temporary Measures Control Order in Singapore [28]. While in Indonesia, the lockdown term can be characterizes lockdown with PSBB (large-scale social restrictions) [29]. Furthermore, at the end of this data collection, the term PPKM (Enforce Restrictions on Community Activities) became more popular along with the enactment of this policy in Java and Bali regions [30].

## 5. CONCLUSION

This research shows that the Google trends is a powerful tool to determine public interest in a particular topic. From this interest, it is useful to prepare various public education instruments related to this during the health emergencies aimed to increase society trust to the government. So, continuous control efforts need to be carried out consistently to anticipate fake news that potentially disturbs the prevention action.

### 1 DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

### CONSENT

It is not applicable.

### ETHICAL APPROVAL

It is not applicable.

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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