

Online behavior among Indonesian during the COVID-19 pandemic

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 were 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.

Keywords: COVID-19, vaccination, vaccine, online behaviour, Google trend

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. Fact news also affecting 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 there 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. MATERIAL 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 Jul 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 AND DISCUSSION

Screening for the "COVID-19" term interest

Our first screening shows that at the beginning of the global pandemic, Indonesian was interested to search with the 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 (Figure 1). This pattern persisted until the time this data was collected.

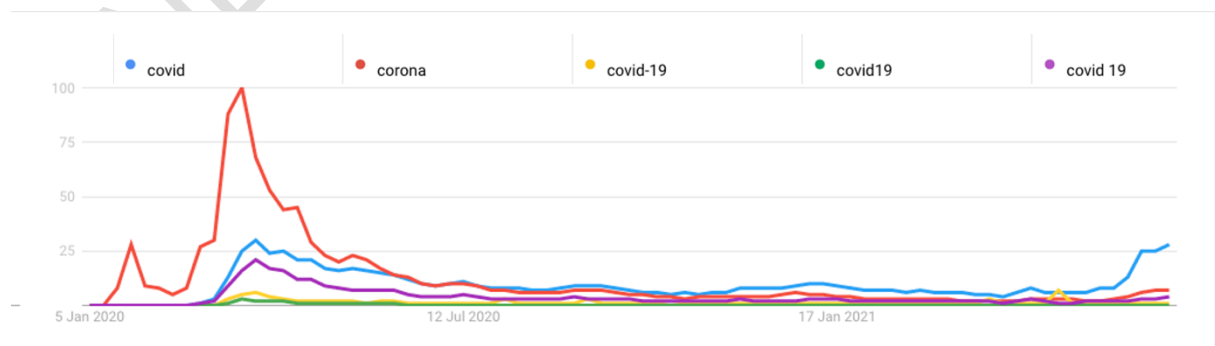


Figure 1. Term interest comparison for COVID-19

Figure 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 were using corona term when they surfing in Goole.



Figure 2. Detailed comparison based on province

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 Figure 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.

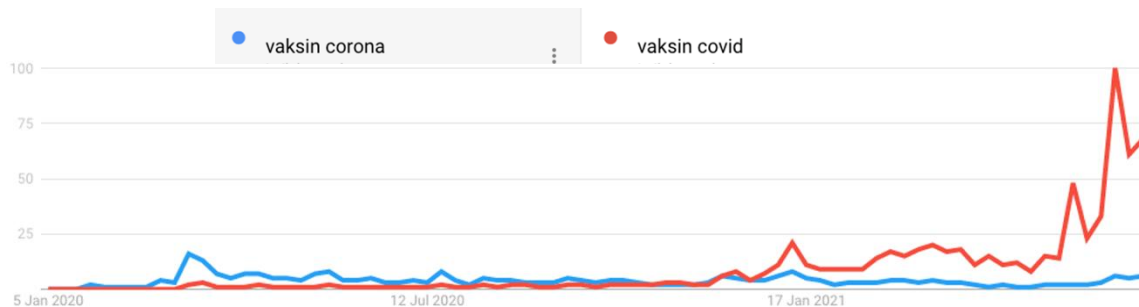


Figure 3. Term interest comparison for COVID-19 vaccine

People interest related to vaccine brand

Figure 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.

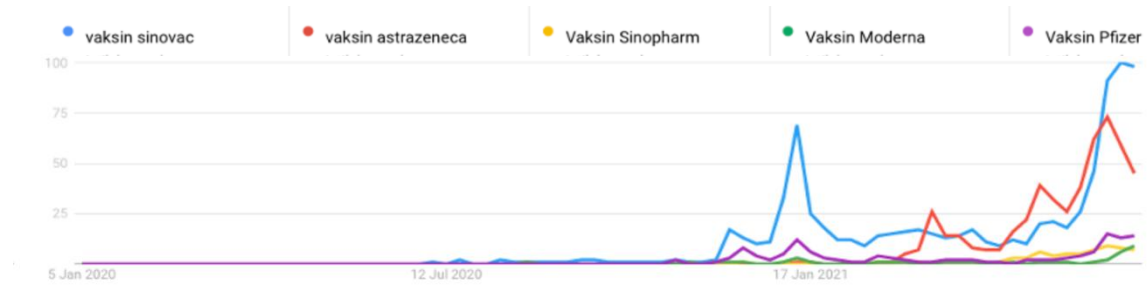


Figure 4. Term interest comparison for COVID-19 vaccine brand

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 quarantine regional and "PSBB" or large-scale social restrictions and "PPKM" or Enforcement of Restrictions on Community Activities. Figure 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.

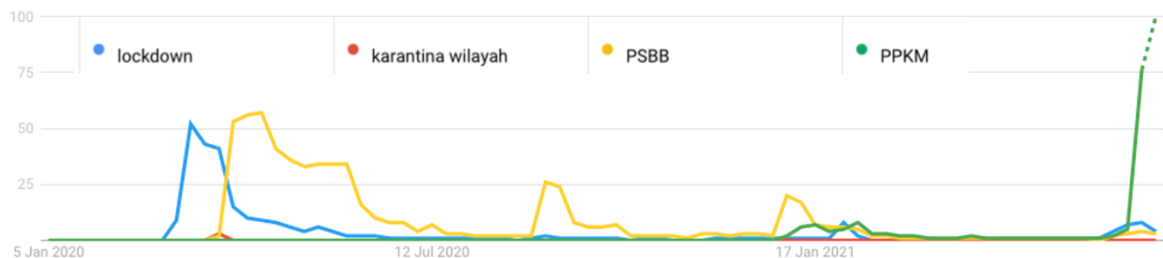


Figure 5. Term interest comparison for the type of government policy

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 reduce 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 information that people need.

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 reduce their anxiety. Many studies has been done that COVID-19 pandemic resulted some phycological and mental disorder such as stress and anxiety [9]–[11][12], [13]. It is understandable because COVID-19 was just discovered for the first time and there was no evidence yet related this disease, including how to prevent it.

Indonesia has started the COVID-19 vaccination in January 2021[14]. When first introduced in Indonesia, 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 the 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 shows 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 vaccine brands was introduced globally including in Indonesia. Sinovac has received a lot of interest because this was the first vaccine to be introduced and used in this country. Prior that event, Indonesia famous as one of clinical trial phase three of Sinovac vaccine [24], perhaps it was be a reason why Sinovac information interested for the society. After some period from January, AstraZeneca started to get interest. 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 out to answer their curiosity. Various issues and news distributed online through multiple media among the public related to vaccines build positive and negative responses. This also affects their trust in the Indonesian government in handling COVID-19. People observed the government's competence and values during the government action [26].

The public is also interested in government policies in controlling COVID-19. At the beginning of 2020, the term lockdown dominated public interest, 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].

4. CONCLUSION

This research shows that the Google trend 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 crisis to increase trust primarily in the government. So, continuous control efforts need to be carried out to prepare the community's need for information so that hoaxes do not consume it.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. 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.

REFERENCES

1. Chiou L, Tucker C. Fake News and Advertising on Social Media: A Study of the Anti-Vaccination Movement [Internet]. Los Angeles; 2018. Available from: https://www.nber.org/system/files/working_papers/w25223/w25223.pdf
2. Albarracin D, S. Wyer Jr. R. The Cognitive Impact of Past Behavior: Influences on Beliefs, Attitudes, and Future Behavioral Decisions Dolores. Dep Psychol Univerty Florida. 2000;79(1):5–22.
3. Rahman NA. Knowledge, internal, and environmental factors on environmental care behaviour among aboriginal students in Malaysia. *Int J Environ Sci Educ*. 2016;11(12):5349–66.
4. Arshad Ali S, Bin Arif T, Maab H, Baloch M, Manazir S, Jawed F, et al. Global Interest in Telehealth During COVID-19 Pandemic: An Analysis of Google Trends™. *Cureus*. 2020;12(9).
5. Ahinkorah BO, Ameyaw EK, Hagan JE, Seidu A-A, Schack T. Rising Above Misinformation or Fake News in Africa: Another Strategy to Control COVID-19 Spread. *Front Commun*. 2020;5(June):2018–21.
6. Suhendra D. Deadly “infodemic” looms large over Indonesia’s fraught pandemic response. *The Jakarta Post* [Internet]. 2021 Jul 23; Available from: <https://www.thejakartapost.com/news/2021/07/23/deadly-infodemic-looms-large-over-indonesias-fraught-pandemic-response.html>
7. VOI. The Number Of COVID-19 Hoaxes Increasing, Up To 1,387 Issues Circulating On Social Media. Web [Internet]. 2021 [cited 2021 Aug 4];Tehnology. Available from: <https://voi.id/en/technology/29126/the-number-of-covid-19-hoaxes-increasing-up-to-1-387-issues-circulating-on-social-media>
8. Soroya SH, Farooq A, Mahmood K, Isoaho J, Zara S e. From information seeking to information avoidance: Understanding the health information behavior during a global health crisis. *Inf Process Manag* [Internet]. 2021;58(2):102440. Available from: <https://doi.org/10.1016/j.ipm.2020.102440>
9. Xiong J, Lipsitz O, Nasri F, Lui LMW, Gill H, Phan L, et al. Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *J Affect Disord* [Internet]. 2020;277(July):55–64. Available from: <https://doi.org/10.1016/j.jad.2020.08.001>
10. Simon NM, Saxe GN, Marmar CR. Mental Health Disorders Related to COVID-19–Related Deaths. *Am Med Assoc*. 2020;324(15):1493–4.
11. Al Dhaheri AS, Bataineh MF, Mohamad MN, Ajab A, Al Marzouqi A, Jarrar AH, et al. Impact of COVID-19 on mental health and quality of life: Is there any effect? A crossectional study of the MENA region. *PLoS One* [Internet]. 2021;16(3 March):1–17. Available from: <http://dx.doi.org/10.1371/journal.pone.0249107>
12. Salari N, Hosseini-Far A, Jalali R, Vaisi-Raygani A, Rasoulpoor S, Mohammadi M,

- et al. Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. *Global Health*. 2020;16(1):1–11.
13. Ildil I, Yuca V, Yendi FM. Stress and anxiety among late adulthood in Indonesia during COVID-19 outbreak. *JPPI (Jurnal Penelit Pendidik Indones*. 2020;6(2):31–46.
 14. WHO. Indonesia: WHO Coronavirus Disease (COVID-19) Dashboard With Vaccination Data [Internet]. Web Page. 2021 [cited 2021 Aug 4]. Available from: <https://covid19.who.int/region/searo/country/id>
 15. Al Jazeera. Vaccine hesitancy rises in Indonesia amid COVID-19 pandemic. Al Jazeera [Internet]. 2021 [cited 2021 Aug 4]; Available from: <https://www.aljazeera.com/news/2021/1/4/vaccine-hesitancy-rises-in-indonesia-amid-covid-19-pandemic>
 16. Indonesia COVID-19 task force. Jokowi assures “absolutely no” political, economic interests in COVID-19 vaccine - National. *The Jakarta Post* [Internet]. 2020 [cited 2021 Aug 4]; Available from: <https://www.thejakartapost.com/news/2020/11/17/jokowi-assures-absolutely-no-political-economic-interests-in-covid-19-vaccine.html>
 17. Sholeh MAN. The COVID-19 Vaccination: Realization on Halal Vaccines for Benefits. *Samarah J Huk Kel dan Huk Islam*. 2021;5(1):174–90.
 18. Kabir R, Mahmud I, Chowdhury MTH, Vinnakota D, Jahan SS, Siddika N, et al. Covid-19 vaccination intent and willingness to pay in Bangladesh: A cross-sectional study. *Vaccines*. 2021;9(5):1–14.
 19. Khoo YSK, Ghani AA, Navamukundan AA, Jahis R, Gamil A. Unique product quality considerations in vaccine development, registration and new program implementation in Malaysia. *Hum Vaccines Immunother* [Internet]. 2020;16(3):530–8. Available from: <https://doi.org/10.1080/21645515.2019.1667206>
 20. Islam MS, Kamal AHM, Kabir A, Southern DL, Khan SH, Murshid Hasan SM, et al. COVID-19 vaccine rumors and conspiracy theories: The need for cognitive inoculation against misinformation to improve vaccine adherence. *PLoS One* [Internet]. 2021;16(5 May 2021):1–17. Available from: <http://dx.doi.org/10.1371/journal.pone.0251605>
 21. Ningtyas I. Indonesia battles spread of vaccine misinformation. *Asia Pacific* [Internet]. 2021 [cited 2021 Aug 4]; Available from: <https://www.aa.com.tr/en/asia-pacific/indonesia-battles-spread-of-vaccine-misinformation/2124319>
 22. Scudellari M. How the coronavirus infects cells - and why Delta is so dangerous. *Nature* [Internet]. 2021 [cited 2021 Aug 4];595(7869):640–4. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/34321669>
 23. UK GOV. Vaccines highly effective against hospitalisation from Delta variant - GOV.UK [Internet]. Web. 2021 [cited 2021 Aug 4]. Available from: <https://www.gov.uk/government/news/vaccines-highly-effective-against-hospitalisation-from-delta-variant>
 24. The Jakarta Post. Clinical trials of Sinovac’s vaccine in Indonesia still on track - National - The Jakarta Post [Internet]. The Jakarta Post. 2020 [cited 2021 Aug 14]. Available from: <https://www.thejakartapost.com/news/2020/11/12/clinical-trials-of-sinovacs-vaccine-in-indonesia-still-on-track.html>
 25. Baskoro FM. Indonesia Suspends 450,000 AstraZeneca Vaccine Doses Over Post-Vaccination Death. *Jakarta Globe* [Internet]. 2021 [cited 2021 Aug 4]; Available from: <https://jakartaglobe.id/news/indonesia-suspends-450000-astrazeneca-vaccine-doses-over-postvaccination-death>
 26. OECD. Enhancing public trust in COVID-19 vaccination : The role of governments [Internet]. Paris; 2021. Available from: https://read.oecd-ilibrary.org/view/?ref=1094_1094290-a0n03doefx&title=Enhancing-public-trust-in-COVID-19-vaccination-The-role-of-

- governments&_ga=2.183326895.849931569.1628069590-731546746.1628069590
27. L&E Global. Covid-19: Malaysian Government imposes Movement Control Order | Coronavirus in a Flash [Internet]. Web. 2020 [cited 2021 Aug 14]. Available from: <https://knowledge.leglobal.org/corona/country/malaysia/covid-19-malaysian-government-imposes-movement-control-order/>
 28. The Ministry of Health of Singapore. COVID-19 (Temporary Measures) ACT 2020 - Control Orders [Internet]. Web. 2020 [cited 2021 Aug 14]. Available from: [https://www.moh.gov.sg/policies-and-legislation/covid-19-\(temporary-measures\)-\(control-order\)-regulations](https://www.moh.gov.sg/policies-and-legislation/covid-19-(temporary-measures)-(control-order)-regulations)
 29. Andriani H. Effectiveness of Large-Scale Social Restrictions (PSBB) toward the New Normal Era during COVID-19 Outbreak: a Mini Policy Review. J Indones Heal Policy Adm. 2020;5(2):61–5.
 30. Pangestika D. What you need to know about Indonesia's newest COVID-19 restrictions [Internet]. The Jakarta Post. 2021 [cited 2021 Aug 14]. Available from: <https://www.thejakartapost.com/news/2021/01/14/what-you-need-to-know-about-indonesias-newest-covid-19-restrictions.html>