


Short Communication

Trends of Influenza's Symptoms Drug Search Terms in Indonesian-Language using Google Trends in the Covid-19 Pandemic

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Searching trend**Abstract**

Covid-19 has spread globally and causes severe acute respiratory syndrome. The symptoms of covid-19 have similarities with influenza, such as cough, fever, runny nose, and sore throat. Therefore, the internet sources tend to have an increasing search related to influenza symptoms drugs. This study aims to assess the search trend of influenza symptoms drugs using google trend analysis in Indonesia. We explore Google trend analysis using search terms in the Indonesian language related to influenza symptoms drugs from December 6th, 2020 to November 30th, 2021. The positive confirmed cases were obtained from the Indonesian government website <https://covid19.go.id/>. Our results demonstrated the increasing search terms related to influenza drug symptoms during July and August. The highest term search was "obat batuk". The positive covid-19 confirmed cases in Indonesia increased during July and August. During the peak of the covid-19 outbreak in Indonesia in July-August 2021, there was an increase in Google Trends searching related to influenza's drug symptoms.

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INTRODUCTION

The covid-19 pandemic has affected more than 200 countries worldwide, including Indonesia. The first cases of covid-19 in Indonesia were detected on March 2nd, 2020, in Jakarta, the capital city of Indonesia. Up to April 19th, 2022, according to WHO (<https://covid19.who.int/>), there were 503,131,834 total cumulative cases of Covid-19 around the world, and there were 6,200,571 cumulative deaths, with 11,324,243,310 vaccines were administered around the world. At the end of March 2020, Indonesia's case fatality rate (CFR) reaches 8.9%. During covid-19, to prevent the spread of covid-19, the Indonesian government implied stay-at-home notification¹.

Covid-19 causes similar symptoms to the influenza virus, such as cough, fever, runny nose, sore throat, and fatigue. In some cases, covid-19 can complicate differential diagnosis. Since influenza and covid-19 showed similar symptoms of respiratory disease, influenza pandemics seem to be a model of covid-19 pandemics. Moreover, covid-19 symptoms can cause weakness, taste disorder, and myalgia^{2,3}. The patients who present those symptoms should be promptly checked for SARS-CoV-2 infection. The diagnostic testing for covid-19 includes molecular testing, serology testing, and other laboratory assessment. The pharmacology treatments of covid 19 include antiviral drugs, anti-inflammatory drugs, low molecular weight heparins, plasma, and hyperimmune immunoglobulins⁴.

Anxiety, stress, depressive symptoms, and post-trauma growth (PTG) are other effects of the Covid-19 pandemic. This condition is influenced people's health-seeking behavior. A study in Lahore, Pakistan, found a change in people's health-seeking behavior. During the Covid-19 pandemic, the trend of self-medication was increasing, and the number of people visiting hospitals decreased⁵.

In Indonesia, a study in four provinces (East Java, Central Java, Riau, and South-East Celebes) also found that during the Covid-19 pandemic, people tended to do self-medication compared to visit health center services or hospitals⁶. A qualitative study in Makassar, Indonesia, also found the increasing trends of self-medication because people were afraid to visit the hospital. They also thought medicine from drug stores could cure their diseases, such as influenza symptoms⁷. In Indonesia, self-medication was used for influenza symptoms (such as fever, headache, and cough), diarrhea, acute pain, and indigestion⁸. During the Covid-19 pandemic, Indonesia's top three diseases cured by self-medication were fever, flu, and cough. People get information related to the medication from family, friends, or the internet⁹.

Nowadays, the internet is a popular source of health information. One internet that can be used for searching health care information is Google Trends. Since 2004, Google Trends has explored web behavior topics or terms. In Google Trends, users can use up to five topics or terms, and the result will be displayed as a set of time series. Google Trends have become a powerful tool to demonstrate epidemiologic surveillance. It is believed to be reliable for surveys related to RSV worldwide¹⁰. Previous research on covid-19 has been published using google trends¹¹⁻¹³. However, the use of Google Trends to assess the drug-related terms in Indonesia is limited. Therefore, this study aimed to investigate influenza symptoms' trends in drug searching in Indonesia. Moreover, the positive confirmed cases during covid-19 in Indonesia were searched to obtain the peak of the covid-19 outbreak.

MATERIALS AND METHODS

Google Trend Searching

Google Trends were used to search influenza symptoms drug terms in Indonesian between December 6th, 2020, and November 30th, 2021. The exploration data was shown by a graphic that indicated relative search volume (RSV). The terms related influenza's drugs in Indonesian language were "obat flu", "obat batuk", "obat pilek", "obat demam", and "obat sakit tenggorokan". "Obat flu" means "influenza medications," while "obat batuk," "obat pilek," "obat demam," and "obat sakit tenggorokan" means "cough medications," "runny nose medications," "fever medications," and "sore throat medications," respectively. The terms were searched in comparison of those five terms/ keywords and individual search of those five terms/ keywords.

Positive Covid-19 Confirmed Cases in Indonesia

To obtain the positive Covid-19 confirmed cases in Indonesia, the Indonesian government website (<https://covid19.go.id/>) and WHO website (<https://covid19.who.int/>) were accessed. Both websites provided information related to the Covid-19 cases in Indonesia, including positive Covid-19, confirmed cases, recovered Covid-19 cases, and mortality cases of Covid-19 in Indonesia.

RESULTS AND DISCUSSION

Figure 1 shows Indonesia's positive confirmed cases of covid-19 from December 2020 to November 2021. This figure indicated increasing covid-19 positive cases in Indonesia during July and August. Previous research showed that the case fatality rate (CFR) of covid-19 reached 8.9% at the end of March 2020. To minimize and prevent the covid-19 spread in Indonesia, the central government applied the regulation of a social distancing project called *Pembatasan Sosial Berskala Besar* (PSBB) by April 2020. The implementation of PSBB depends on the local governments because the central government gave the authority of implementation to the local governments. However, before the local governments implemented the PSBB, they had to wait for approval from the Indonesian Ministry of Health. Thus, the implementation of PSBB, such as time and policy, is diverse in each area of Indonesia^{14,15}.

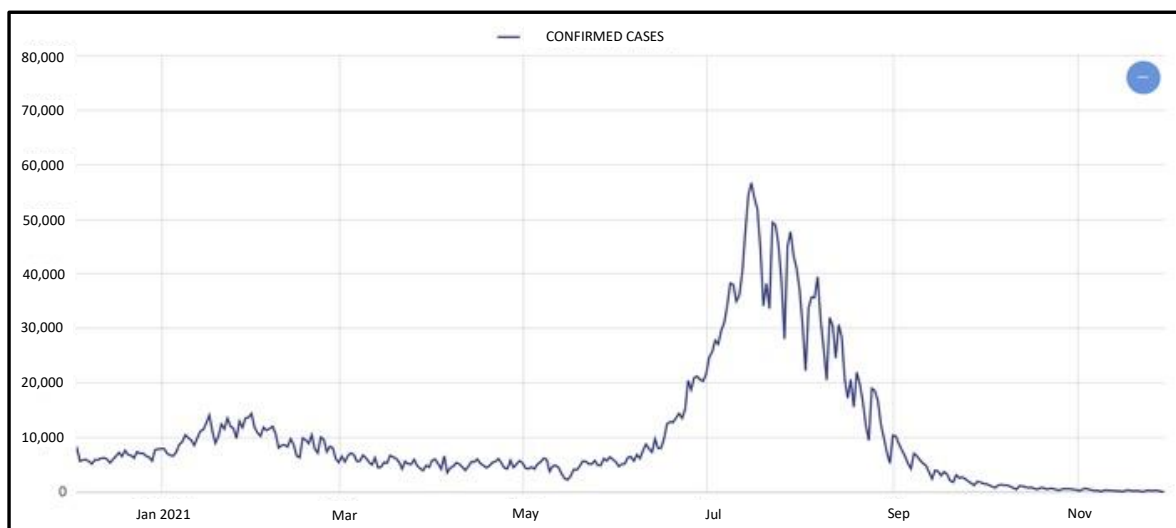


Figure 1. Positive confirmed cases of Covid-19 in Indonesia from December 2020 to November 2021

Using the search terms related to drug-related influenza symptoms, this study reported searching trends during the Covid-19 outbreak in Indonesia, from December 6th, 2020, to November 30th, 2021. The RSV of search terms “*obat flu*”, “*obat batuk*”, “*obat pilek*”, “*obat demam*”, dan “*obat sakit tenggorokan*” in comparison were displayed in Figure 2. This figure illustrated the increasing trends in all five search terms during July and August. The main symptoms of Covid-19 are fever, cough, fatigue, slight dyspnea, sore throat, headache, conjunctivitis, and gastrointestinal issues. The highest RSV was found on the term “*obat batuk*”. This result aligns with previous studies that cough is one common symptom of Covid-19. Cough is one of the usual symptoms of Covid-19, which can persist for weeks or months after the infection¹⁶. Another longitudinal study in Geneva found that cough and loss of taste or smell were common symptoms in the early phase¹⁷. A systematic review also found that cough was a common symptom of Covid-19 in 25 studies. Based on the studies in this systematic review, among 1000 people, around 655 people would get a cough. Of 655 people who got a cough, 142 people would have Covid-19. Of the rest of the 345 who did not get a cough, around 68 people would get Covid-19¹⁸. However, the result of the current study is different from the result of Lai *et al.* in 2020, which found the most common symptom of Covid-19 was fever, followed by a cough¹⁹.

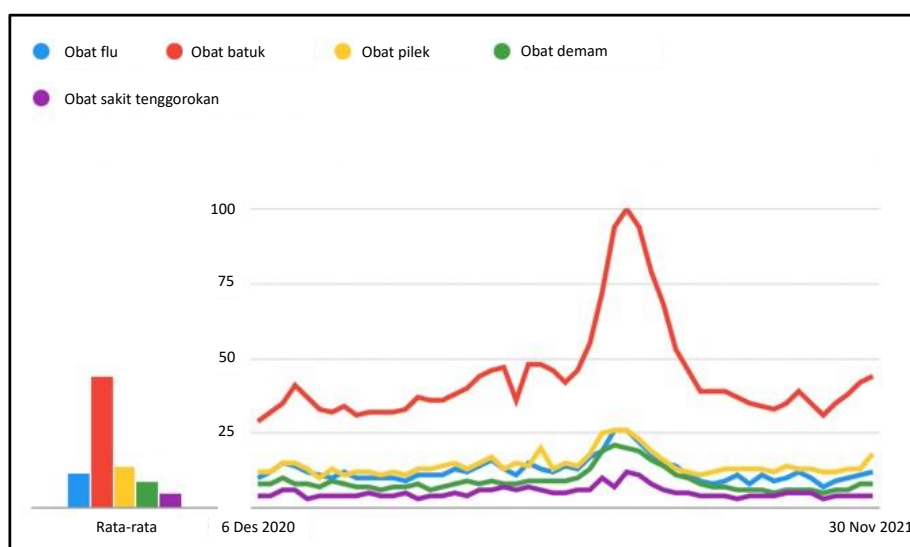


Figure 2. Google Trends Search Terms of “*Obat flu*”, “*Obat batuk*”, “*Obat pilek*”, “*Obat demam*”, and “*Obat sakit tenggorokan*” from December 6th, 2020 to November 30th, 2021

Next, to determine each term's individual trend, the keyword using Google Trends was conducted. Figure 3 demonstrates the individual figure of each term. All the individual figures showed an increasing trend between July and August 2021. Terms of “*obat flu*”, “*obat batuk*”, “*obat pilek*”, “*obat demam*”, and “*obat sakit tenggorokan*” were found to have the similar trend. The frame time of increasing individual trend search of “*obat flu*”, “*obat batuk*”, “*obat pilek*”, “*obat demam*”, and “*obat sakit tenggorokan*” is similar with the increasing of covid-19 positive cases in Indonesia. This condition can be related to anxiety and stress. During the Covid-19 pandemic, Indonesian people's prevalence of mental health problems, such as stress, anxiety, and depression, increased. Information from the mass media could be one of the reasons. A study in China found that the use of media mass was associated with negative affect, anxiety, and stress²⁰. In Indonesia, the use of media mass is also positively associated with anxiety. The content of information from media mass is also related to people's mental health. Stressful content was more associated with negative affect, stress, and anxiety. On the other hand, positive content, such as heroic acts and disease prevention, was associated with positive affect and less depression²¹. Between July and August 2021, more negative information, such as positive cases and death news, was in the mass media. This stressful content could lead to anxiety in the community.

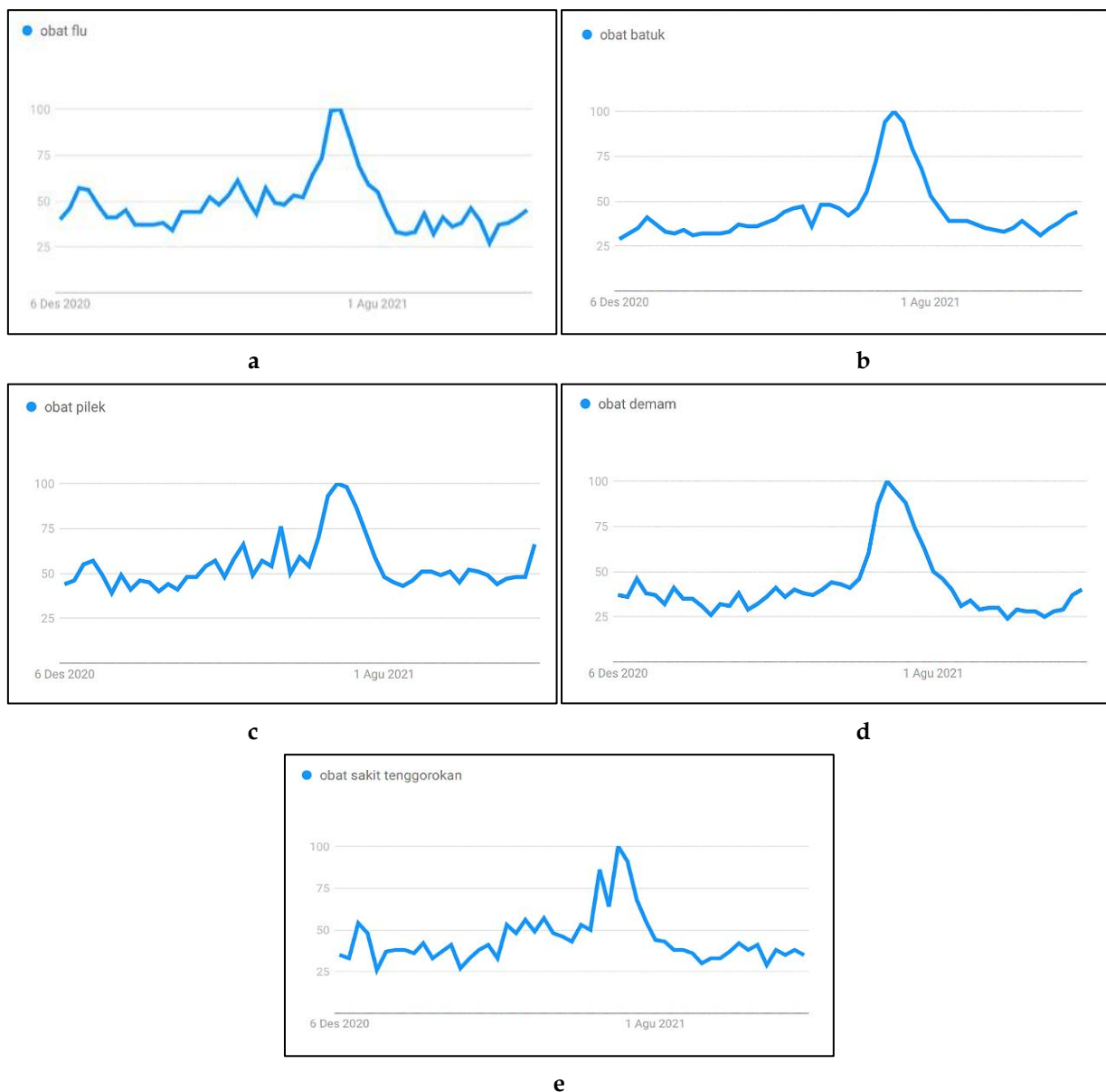


Figure 3. Google Trends Search for Individual Term of “*Obat flu*” (a), “*Obat batuk*” (b), “*Obat pilek*” (c), “*Obat demam*” (d), and “*Obat sakit tenggorokan*” (e) from December 6th, 2020 to November 30th, 2021

The trend shown by combination terms or individual terms related to influenza's symptoms drugs showed a similar pattern with positive Covid-19 confirmed cases trends from the government website. The increasing Google Trend search and positive Covid-19 confirmed cases peaked in July and August 2021. This result may be related to the increase in anxiety. Anindyajati *et al.*²² found that one in five people in Indonesia got anxiety during the pandemic of Covid-19. One of the riskiest groups is people who are suspected cases of Covid-19. However, the anxiety could make people think twice before they go to the hospital during the Covid-19 pandemic. A study in Indonesia found that during the Covid-19 pandemic, people tended to self-medicate compared than visiting health center services or hospitals⁶. Other studies found that during the Covid-19 pandemic, fever, flu, and cough were the top three diseases cured by self-medication. The medicine information usually comes from family, friends, or the internet. A study found that during the second wave of the outbreak of Covid-19 (during June 2021), people self-medicate based on information they got through social media, such as WhatsApp²³. In the future, Google Trends analysis related to the Covid-19 drugs, such as antiviruses and vitamins, need to be investigated.

CONCLUSION

During the covid-19 outbreak peak in Indonesia, reported in July and August, there were increasing Google search terms related to influenza's symptoms drugs. The highest Google search terms were observed on "Obat batuk" terms. Further research related to the correlation of positive covid-19 confirmed cases with Google search terms related to the drug using statistics analysis needs to be explored.

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AUTHORS' CONTRIBUTION

Nailis Syifa': data collection, formal analysis. **Nurul Purborini**: data collection, formal analysis.

DATA AVAILABILITY

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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