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Trend for Risk Covid-19: A Case Study in Indonesia

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Abstract

Since the end of 2019, the whole world has been shocked by the increasing outbreak of Covid-19 including in Indonesia. Google trend data provides important information that supports decision making. The aims of this study for measuring the activities of cyber users to get the latest information regarding the spread of Covid-19, the use of masks, the importance of maintaining personal hygiene, lockdown, environmental cleanliness, and being able to predict an increase or decrease in Covid-19 cases. This study explores data using google trends to reduce the number of Indonesian citizens' anxiety in the Covid-19 case. the data was analysis using stata for Time-Lag Correlation. Relative search volume (RSV) by using Google Heat Map. The correlation test RSV between Covid-19 cases and the use and price of masks, hand washing and, number of cases Covid-19. the test shows that the value of F (2, 242). The variables tested were 2 variables, namely the use of masks and washing hands while the observed number was 242. The R-Squared value showed 0.1163 that all independent variables had an effect on the dependent variable.

Introduction

Officially on February 1, 2020, WHO officially announced that around the world there were 11,953 cases of Covid-19. A total of 11,821 came from China (World Health Organization, 2020b; WHO, 2020). The spread of Covid-19 is very fast, the first spread occurred in China, which is located in Wuhan. In general, WHO confirmed as many as 896,475 cases (positive), 45,525 (died). Subsequently spread in 27 countries. Since the increase in cases occurred, the WHO issued a pandemic mandate as a health emergency status. At present the highest case of Covid-19 that has caused death occurs in the United States of 20444(WHO, 2020) the central government is very active in monitoring to reduce the spread rate even higher and prevent cases of very fast death (Burke et al., 2020).

The first case occurred in the city of Wuhan, China, which originated from an animal market, actually Covid-19 is a type of influenza virus that originally only occurred in animals, but now can be transmitted to humans. This virus has been around for 200 years, but along with the development of the virus and environmental conditions, this type of virus changes the incubation period into 4 types of incubation and without any early symptoms (Gao et al., 2020). The spread is very fast to various countries in the world, one of which is Indonesia.

Indonesia was confirmed as a country with Covid-19 cases, from WHO data there were 1677 confirmed cases of Covid-19 (149 new cases), 157 (died) and, 21 (new death cases) (Lauer et al., 2020). With the emergency response issued by WHO, the Government of Indonesia said to prevent an increase in the number of Covid-19 transmissions by carrying out social distancing and physical distancing. Of course, this is very influential in various sectors in Indonesia, because there are limited activities, thus sparking ideas for policymakers to carry out all activities online (Tanser & le Sueur, 2002)

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Renewable data accessed from the Covid-19 website as of March 22, 2020, globally there were 1,773,084 cases of Covid-19 (confirmed positive), 111,653 (died) and 449,589 (recovered). For cases that occurred in Indonesia 4,555 (confirmed positive), 399 (died), and 380 (recovered) (WHO), 2020). With easy access to information in cyberspace related to this case, people all over the world can certainly protect themselves and increase awareness of healthy living. The use of search engines in cyberspace whose data is used, processed, and analyzed provides information for policymakers in making decisions, supporting researchers to use the Google Trend (GT) data for Covid-19 Cases in Indonesia predicting an increase or decrease in the Covid-19 outbreak (Schwartz et al., 2020)

Method

We retrieved google trend (GT) data for the specific locations of Indonesia nationwide and subregions using defined search terms related to coronavirus, handwashing, and number of case covid-19. All data was analysis using Stata. using google trends to get location-specific data in Indonesia and search sub-categories about Covid-19, masks, hand hygiene, and cases. Relative search volume (RSV) data filter by geograpihic region in Indonesia using Google Heat Map. Time-lag for correlation was analysis using Stata version 13.

Result and discussion

Search related to covid-19 (figure 1) in Indonesia at an early stage occurred in January 2020, when WHO declared that Covid-19 was an epidemic and a world emergency alert (WHO, 2020b). In Indonesia there was an increase and the first wave occurred at its peak on April 16, 2020 when there was local transmission and along with this data, WHO declared vigilance over this situation where the death rate due to Covid-19 has been recorded in Indonesia (WHO, 2020c). a few weeks later the information in the world there was a significant increase in mortality (Burke et al., 2020), and it was predicted that there would be a second wave in China (Davis et al., 2020).

Table 1 shows the ¬time-lag correlation between the causes of the coronavirus and the incidence of covid-19 with the number of local transmissions where the R-Squared value shows 0.3886 that the independent variable affects the dependent variable. By examining the relationship using time-lag correlation, it can use as a basis for predicting the incidence rate of increasing or decreasing (Husabø et al., 2020). It very helpful for policymakers to make decisions to reduce the incidence of covid-19 (Husnayain et al., 2020; Xiong et al., 2020). In addition, face masks increasing as cases of Covid-19 have spread to several countries and the availability of surgical masks is scarce (Esposito et al., 2020).

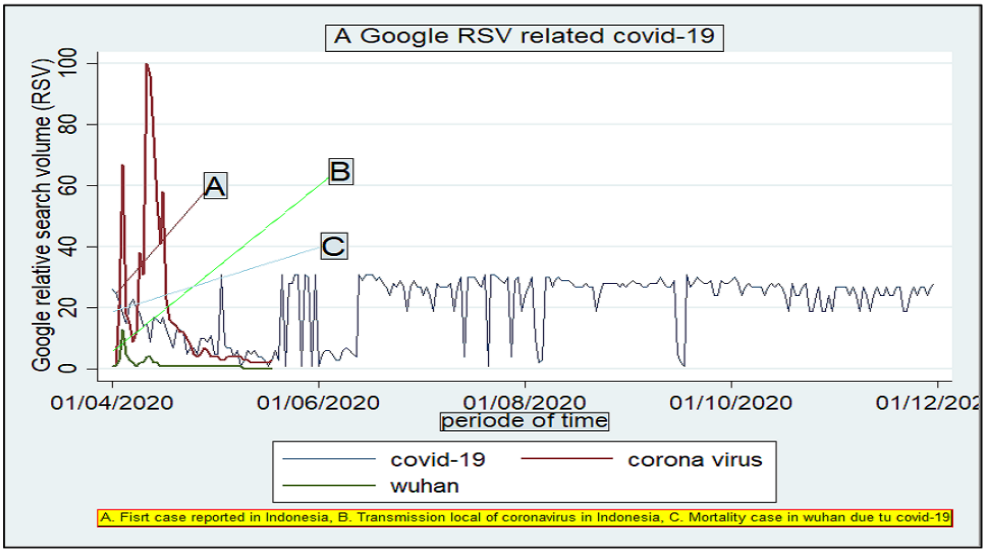

Fig. 1 Time Series of Google RSV Related to Covid and COVID-19 Cases in Indonesia
Source: Secondary data, 2020

Table 1. Time-lag Correlations between Google RSV Related to COVID-19 and COVID-19 Cases in Indonesia

Source	SS	df	MS		
Model	1005.6176	2	502.808802	Number of obs	= 48
Residual	1420.04906	45	31.5566459	F(2, 45)	= 15.93
				Prob > F	= 0.0000
Total	2425.66667	47	51.6099291	R-squared	= 0.4146
				Adj R-squared	= 0.3886
				Root MSE	= 5.6175

corona	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
covid_19	-.101452	.2215665	-0.46	0.649	-.5477099	.3448059
umber_of_cases	1.376637	.2450499	5.62	0.000	.8830812	1.870193
_cons	-9.988814	4.004916	-2.49	0.016	-18.05513	-1.922499

Source: Secondary data, 2020

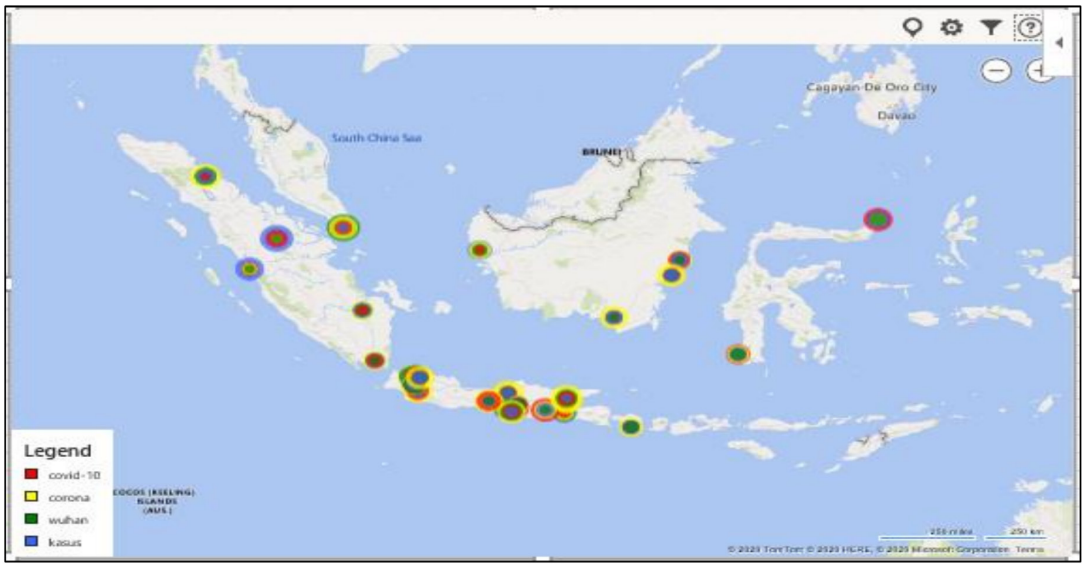

Fig. 2. Map of the Distribution of Interest of Time Covid-19 per Region in Indonesia
Source: Secondary data, 2020

Figure two shows the interest of time in the highest area distribution for Covid-19 cases in the Java region. Several health facilities reported about Covid-19 clusters (Li et al., 2020). The number of incidents with Indonesian citizens' efforts to anticipate staying at home (Gao et al., 2020). Trends that occur and helpfully know the distribution of areas so that epidemiologists can take preventive action as early as possible (Schulz et al., 2018).

The information presented in the (table 2) of the correlation statistical test between RSV and Covid-19 cases, the use and price of masks, washing hands and, the number of Covid-19 cases shows that the F value (2, 242) shows the variables tested, there are 2 variables, namely the use of masks and washing hands while the observed number was 242. The R-Squared value showed 0.1163 that all independent variables had an effect on the dependent variable. WHO recommends tightening health protocols, especially the use of masks, maintaining hand hygiene because the number of deaths in several countries is increasing very high (Yokohama, 2020; Ramadona et al., 2019; WHO, 2020a). Not only hand hygiene, but the number of

local transmissions that occur has added to the family and workplace clusters (Gao et al., 2020).

Table 2. Time-lag Correlations between Google RSV Related to COVID-19 and Hand-wash in Indonesia

Source	SS	df	MS		
Model	2605.80066	2	1302.90033	Number of obs	= 245
Residual	19804.7544	242	81.8378283	F(2, 242)	= 15.92
				Prob > F	= 0.0000
Total	22410.5551	244	91.8465373	R-squared	= 0.1163
				Adj R-squared	= 0.1090
				Root MSE	= 9.0464

corona	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
mask	-.1055118	.0711428	-1.48	0.139	-.2456499	.0346263
hand_wash	-.7637151	.1812578	-4.21	0.000	-1.120759	-.4066706
_cons	26.66171	1.14628	23.26	0.000	24.40375	28.91967

Source: Secondary data, 2020

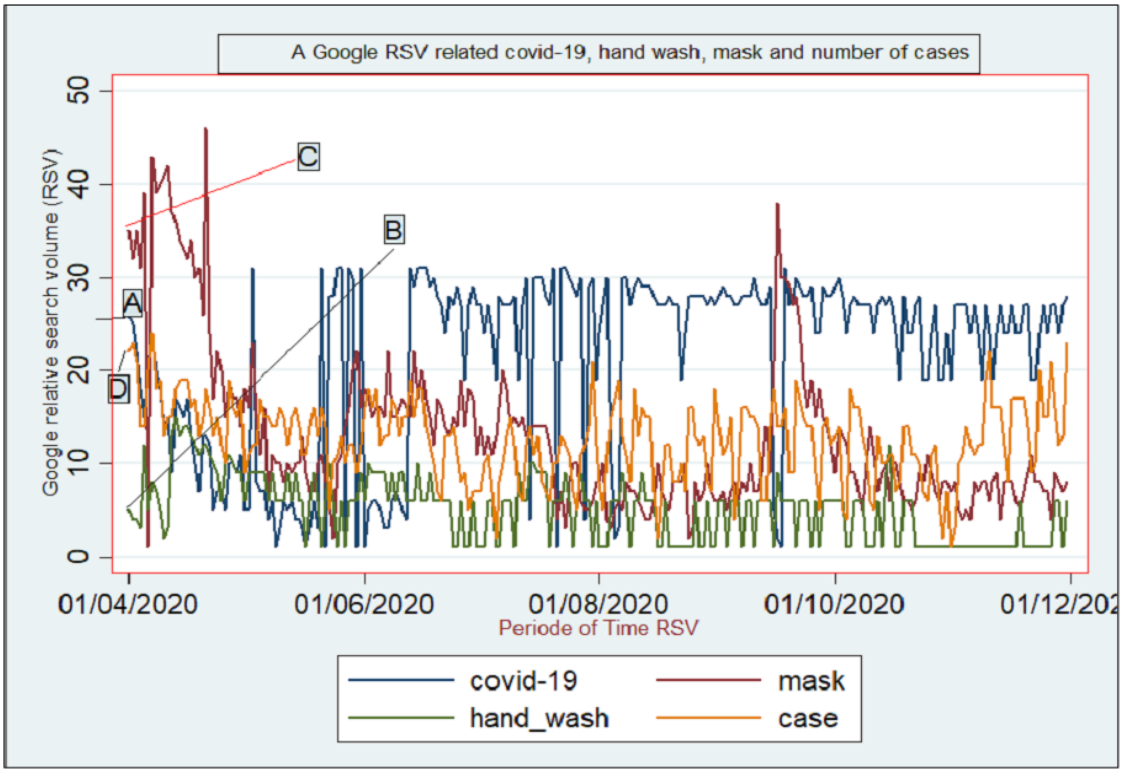

Fig. 3 Time Series of Google RSV Related Face Mask, Hand Wash and COVID-19 Cases in Indonesia
Source: Secondary data, 2020

The figure three shows that search activities occurred in the period from April to December 2020. At point A, it shows that data accessed with the keyword covid-19 that occurred in Indonesia (April 22th, 2020) is the first wave until May 2nd, 2020, and decreased again on May 15th, 2020. Then there was a Second wave, until its peak on June 14th, 2020, until December it was still sloping with high intensity. The second addition is the keyword washing hands is marked with the letter B. in green, indicating that this activity was accessed for the first time on April 2nd, 2020 in line with the circulating information on Covid-19 in Indonesia. Accessibility is relatively up and down on May 15th, 2020, when it happened along with the increasing cases of Covid-19 in Indonesia. Until December the search trend

was relatively stable without any high waves. An addition is a search with the keyword mask marked with the letter C. The data obtained by access began on April 4th, 2020, in line with the increase in local transmission of Covid-19. There were 2 waves, the first wave peaked on 28 April 28th, 2020 and sloped down, while the second wave occurred on May 7th 2020 and decreased drastically on May 11st 2020, while the third wave occurred on October 2020 when the Covid-19 case occurred because there was an additional family clusters, work location clusters and the existence of new norms.

WHO also recommends that the use of surgical masks be prioritized for health workers, while civilians are advised to use non-surgical masks and it is declared that wearing masks will reduce the transmission of covid-19 cases(Schulz et al., 2018), besides that certain masks do not only protect transmission but can also prevent local transmission because the condition of the boundaries in several countries, one of which is Indonesia, has returned to normal (Wong et al., 2020; Li et al., 2020; Y. Wu et al., 2020)

In addition, information related to washing hands is relatively stable, has increased when the case of Covid-19 has increased again, this shows that public awareness of the importance of a healthy lifestyle, personal health and, proper hand wash procedures to support and prevent contracting Covid-19 (Romanov, 2020; Xiong et al., 2020). Accuracy in hand wash can have a personal health effect when there is a missed mask after making contact with other people (J. T. Wu et al., 2020; Esposito et al., 2020; Jin et al., 2020).

Meanwhile, (figure 4) shows the distribution of covid-19 cases in Indonesia has increased for two weeks after being informed of a new normal. The distribution center is in Java, number two on Sumatra, Kalimantan, Sulawesi, and Papua. There are indicates that the increase is a form of awareness of the equal distribution of covid-19 cases in Indonesia. The leg-interest of time shows information searches a week after dissemination for information from each region is getting higher. The rate of local transmission cases so very tight monitoring further increases spread if Indonesians disobedient the protocol (Schwartz et al., 2020; Matuschek et al., 2020)

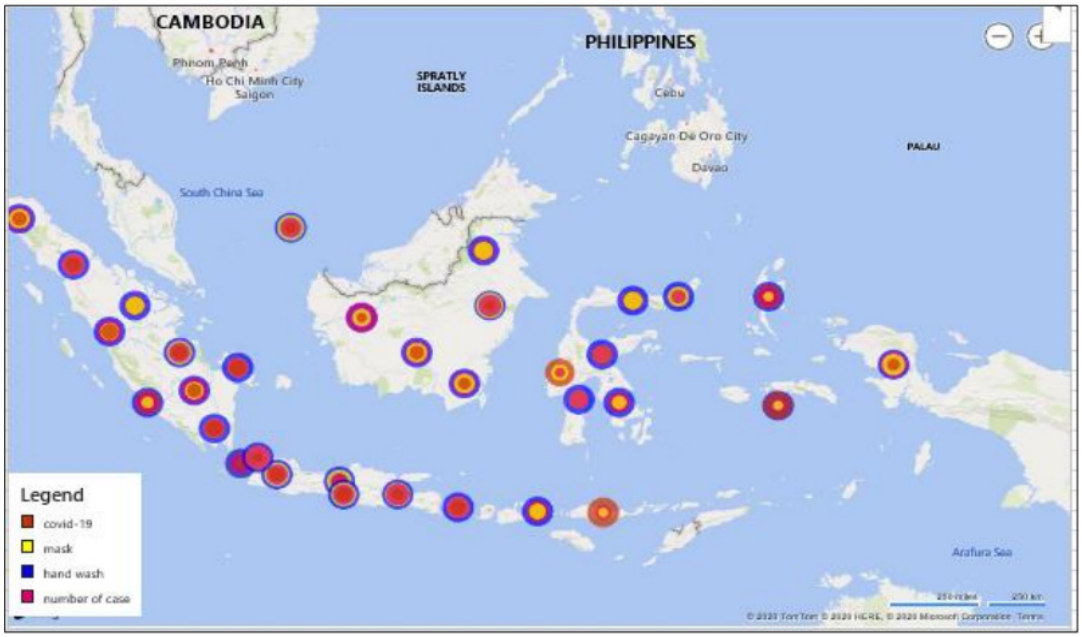

Fig.4 Map of the Distribution of Interest of Time Related Face Mask, Hand Wash and COVID-19 Cases per Region in Indonesia

Source: Secondary data, 2020

Conclusion

Time-lag correlation between the causes of the coronavirus and the incidence of covid-19 is with the number of local transmissions, where the R-Squared value shows 0.3886 that the independent variable affects the dependent variable. The interest of time in the highest area distribution for Covid-19 cases in the Java region. Several health facilities reported about Covid-19 clusters. The number of incidents with Indonesian citizens' efforts is to anticipate staying at home. The rate of local transmission cases so very tight monitoring further increases spread if Indonesians disobedient the protocol. The distribution of covid-19 cases in Indonesia has increased for two weeks after being informed of a new normal. The distribution center is in Java, number two on Sumatra, Kalimantan, Sulawesi, and Papua. There are indicates that the increase is a form of awareness of the equal distribution of covid-19 cases in Indonesia. The leg-interest of time shows information searches a week after dissemination for information from each region is getting higher

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