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# Machine Learning Identification on Twitter Towards Combating Covid-19 (SARS-CoV-2): Pandemic Attacks and Urban Resilience in Indonesia

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## Abstract

The purpose of this study is to detect the topic and discourse of the development of covid-19 and its resistance on social media Twitter in Indonesia. This research method is surveyed through Machine Learning to filter, track, and predict the spread of Covid-19 (SARS-CoV-2) on Twitter, and is assisted by Nvivo 12 pro and Ncapture analysis tools to collect data from *big data* on Twitter. The results of this study show ML (*Machine Learning*) plays a role in fighting the virus, especially looking at it from the perspective of screening, forecasting, and vaccines spread across various social media accounts on Twitter. A comprehensive survey of ML algorithms and models used in covid-19 (SARS-CoV-2) development expeditions on Twitter can help fight the virus. This research shows that the hashtag #lawancovid19 (Fight Covid-19) has relevance to several new hashtags that are still relevant in campaigning against covid-19 on Twitter to combat community and urban vulnerabilities in Indonesia. Collectively, characteristics such as Tagar #ayovaksin (let's get vaccinated), #jagajarak (keep your distance), and #ayopakaimasker (let's wear masks) support the resistance to covid-19 in Indonesia the account (@Username) that is most often @mention in the covid-19 cloud l action is the account of the @jokowi (President of Indonesia). The social media movement (Twitter) in encouraging community resilience and urban resilience through digital communication against Covid-19 (SARS-CoV-2) has predominantly succeeded in shaping understanding, behavior, and prudence in interacting directly in public spaces. This is important in the context of assessing messages and communications within the overall social media (Twitter) communication activities in response to online resistance measures in support of public health as well as to digitally address the global pandemic. This research contributes to

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providing insight into the dynamics of covid-19 (SARS-CoV-2) combat communication on Social-Media (Twitter) and supporting public health measures.

**Keywords:** *Machine Learning, Covid-19 (SARS-CoV-2), Urban Resilience*, *Twitter, Indonesia*

## Introduction

In early 2020, due to Covid-19 (SARS-COV-2), the world faced an unprecedented global health and socioeconomic crisis (Yu, Z. et al., 2021; Chakraborty, I., & Maity, P., 2020). This causes in Indonesia, the lives of children and families seem to stop/experiencing problems (Ozkendir, O. M. et al., 2020; Yu, Z. et al., 2021). Social distancing and school closures have had an impact on education, mental health, and access to basic health services (Ozkendir, O. M. et al., 2020; Yu, Z. et al., 2021; Kuqi, B. et al., 2023). Although it now has more knowledge and equipment to better suppress the spread of the virus, it still has to be vigilant and careful in protecting yourself and children. After Indonesia confirmed the first case of COVID-19 (SARS-COV-2), Indonesia in collaboration with an international institution, UNICEF, has led various efforts to respond to the initial pandemic and sustainable endemic status, together with the World Health Organization (WHO) and other partners (Unicef Indonesia, 2020; Tawai, A. et al., 2021).

The massive spread of Covid-19 (SARS-CoV-2) in Indonesia, raises real concerns that lead to panic and stress that develops in the community (Kaligis, F. et al., 2020; Lugito, N. P. H. et al., 2021; Harjana, N. P. A. et al., 2021). The Covid-19 pandemic caused changes in behavior and perspectives between people, which eventually unknowingly gave rise to new problems (Kaligis, F. et al., 2020; Setiawati, Y. et al., 2021; Son, P. B. et al., 2022). In Indonesia, the growing stigma can be seen in various forms through reporting in the mass media or directly (Sulistiadi, W. et al., 2020; Budhwani, H., & Sun, R., 2020). Mulai from excommunicating patients who have recovered from Covid-19 because they are considered to be able to transmit the disease. Rejecting and excommunicating people who move from one area to another. Excommunicating a certain ethnicity because it is considered a carrier of the virus. Excommunicating medical personnel who work in hospitals because they are considered to have great potential to transmit the coronavirus. Rejecting the remains of Covid-19 patients because they are considered to still carry the virus that can be transmitted to others (Marpaung, Y. N., 2020; Harjana, N. P. A. et al., 2021; Dwinantoaji, H., & Sumarni, D. W., 2020). The government has taken decisive steps in combating the spread of the coronavirus in Indonesia, one of which is through information technology socialization and campaigns against covid-19 in social media (Salahudin, S. et al., 2020; Oktaviani, N. T. et al., 2022; Kominfo, 2020; Prianto, A. L. et al., 2022).

Cases of urban vulnerability (Malik, I. et al., 2021) due to covid-19 have been widely studied by several previous studies, such as several researchers who have tried to explain the ratio of death cases for population segments and urban geographic areas in Indonesia (Pratiwi, S. F., 2021; Harini, S. et al., 2022). A study conducted by De La Vega, R. et al (2020) and Usta, J. et al. (2021) found that the ratio of women is more vulnerable than men because men have a higher awareness than women of the spread of Covid-19. In addition, Huang, Q. et al., (2021) also added that many of the higher covid-19 cases in urban areas are due to high road density and trade and business, transportation, and entertainment facilities and eateries. According to Ruhyana (2021) and Purwanto, P. et al. (2021) a large number of MSEs (Traders) can cause the high spread of Covid-19 and most of the population's livelihoods from sectors affected by social restrictions such as industry, trade, and services. Currently, social trends are shifting in digital interactions, meaning that many Indonesian people are

active on their respective social media (Parahita, G. D., 2019; Ramadanty, S., & Safitri, Y., 2019; Wibawa, B. M. et al., 2022). It is considered that the campaign against covid-19 on Twitter is a form of resistance of the digital community to create effective and efficient urban resilience to create a comfortable and low-risk city due to Covid-19 (SARS-CoV-2).

Given the potential negative implications for individual and community health due to the false stigma against covid-19 in society, the many taglines of #lawancovid19 movements and the like, and the blurring of social and cultural dynamics that drive them, we examined the networks of social media users with a tendency to support the movement to fight covid-19. on Social Media (Twitter). We do this to better characterize how their networks operate, disseminate information, and what topics they engage in online dialogue. This is achieved by using a Pliner interdiction approach to big data, machine learning, content analysis, and social network analysis (SNA) to characterize communicative behavior, and general topics, support network structures and analyze user conversations on Twitter media.

This research aims to detect the topic and discourse of the development of covid-19 and its resistance on social media Twitter in Indonesia. The focus of this study identifies the use of big data, machine learning, and content analysis, and characterizes Twitter messages related to resistance to Covid-19 (SARS-COV-2) and relevant user groups and online communities. To achieve this goal, the study is carried out in 2 different stages: (1) data collection and processing; and (2) data analysis using a machine learning approach with manual annotations of Twitter topics and user-generated messages, whose methods we describe below.

## Research Methods

The research method used in this study is a qualitative analysis of Twitter social media using "*NChapture for Nvivo"* and qualitative analysis tools Nvivo 12 Pro (Woolf, N. H., & Silver, C., 2017). The tweet was accessed via https://twitter.com/search?q=%23lawancovid19&src=typed_query&f=top from Twitter. To collect tweets appropriate to this research topic, tweets are filtered out common keywords related to "Fight Covid-19 (SARS-CoV-2)) including #lawancovid19, #ayovaksi (let's get vaccinated), #jagajarak (keep your distance), and #ayopakaimasker (let's wear masks) as used and validated in a Twitter study on Covid-19 (SARS-COV-2) from Mackey, T. et al. (2020) and Li, J. et al. (2020). From this initial corpus of Covid-19 (SARS-COV-2) general tweets, we then filtered the dataset for #BersamaLawanCorona (Together Against Corona) keywords (including tweets containing #lawanCovid-19 (SARS-CoV-2)), we found there were 1071 tweets #BersamaLawanCorona, and there were 88 tweets with #lawancovid19 keywords. After collecting and filtering the main keyword data in this research topic, we collected hashtags of some relevant tweets in the context of the Covid-19 (SARS-CoV-2) fight pere conducted in Indonesia. Like there are 366 tweets with #ayovaksin keywords, and there are 612 tweets with #jagajarak keywords, and next, there are 292 tweets with #ayopakaimasker keywords. Each tweet contains the content of the tweet and additional metadata such as user information, timestamps, media (e.g. images, videos), and related hyperlinks. Furthermore, the data was pulled using *NChapture for* Nvivo and analyzed through Nvivo 12 Pro.

## Results and Discussion

### Hashtag #lawancovid19: Identification and Exploration of Collective Action against Covid-19 (SARS-CoV-2) on Twitter in Indonesia

The rise of digital community movements in Indonesia, such as Indonesia Against Covid-19 (IAC-19), as a form of Volunteers for the Digital Community Connective Action Task Force in helping the Government fight Covid-19 (Prianto, A. L. et al., 2021; Prianto, A. L. et al., 2022). The high level of urban vulnerability due to covid-19 has increased the awareness of the Indonesian people, winning against Covid-19. Many Indonesians are aware of collective action so that Indonesia can be free from this pandemic and can act safely. The Indonesian nation has a very good capital, namely the attitude of cooperation. This is marked by the number of hashtags against covid-19 spread on social media (Twitter), such as #lawancovid19, #BersamaLawanCorona, #ayovaksi, #jagajarak and #ayopakaimasker. Below are the results of the identification and exploration of collective resistance on Twitter to fight Covid-19 in Indonesia.

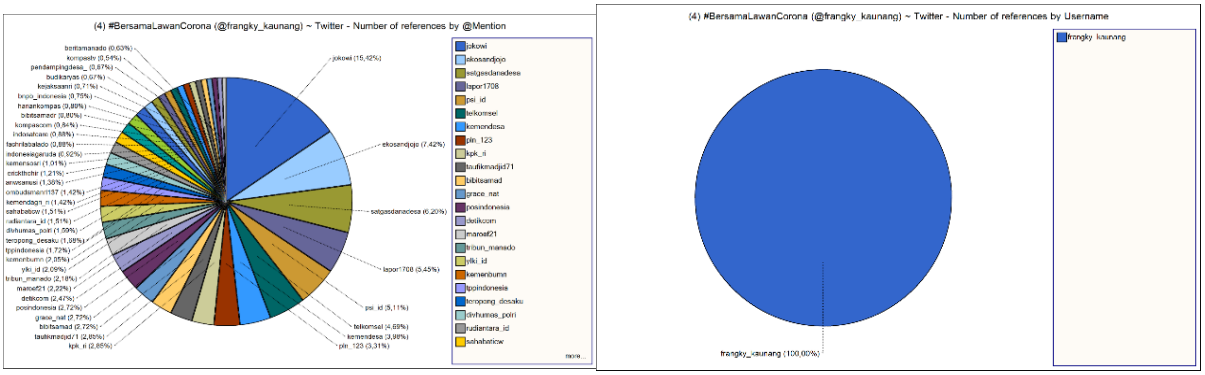


**Figure 1.** *The account that is most often @mention in voicing #BersamaMelawanCorona on Twitter. Source: Analyzed via Nvivo 12 Pro, 2023*

Figure 1 shows that the account that most often voices (Tweets) about #BersamaLawanCorona (together against corona) in Indonesia is the account of @frangky_kaunang and I who are most often @mentions about the action against covid-19 on Twitter, namely @jokowi with a percentage of 15.42% tweets, @ekosandjojo with a percentage of 7.42%, @satgasdanadesa with a percentage of 6.20%, @lapor1708 with a percentage of 5.45%, @psi, id with a percentage of 5.11%, @telkomsel with a percentage of 4.69%, @kemendesa with a percentage of 3.98%, @pln_123 with a percentage of 3.31%, @kpk_ri with a percentage of 2.85%, etc. This shows that the account that is most often @mention to fight covid-19 on social media is @jokowi (president of Indonesia). This indicates that the digital society of Indonesia (Twitter) expects great support from the President of Indonesia regarding the vulnerability case due to Covid-19 to be fought together.

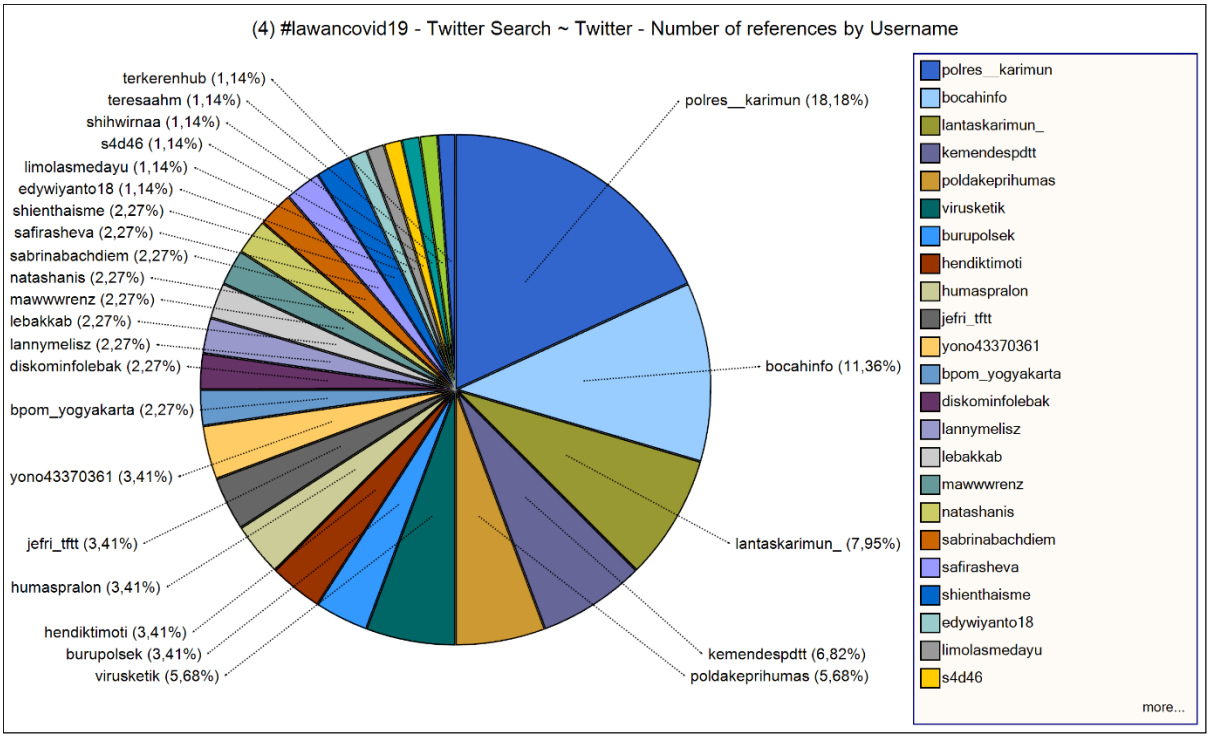


**Figure 2.** *The account (@Username) that is most frequently voiced #lawancovid19 on Twitter. Source: Analyzed via Nvivo 12 Pro, 2023*

In addition to the #BersamaLawanCorona hashtags that are most often voiced on Twitter, there are #lawancovid19 hashtags that intersect with each other to encourage resistance to covid-19 on Twitter for the Indonesian digital community, Figure 2 above shows that the account (@Username) that most often voices (tweets) #lawancovid19 is @polres_karimun with a percentage of 18.18%, @bocahinfo with a percentage of 11.36%, @lantaskarimun_ with a percentage of 7.95%, @kemendespdtt with a percentage of 6.82%, @poldakeprihumas with a percentage of 5.68%, @virusketik with a percentage of 5.68%, @burupolsek with a percentage of 3.41%, @hendiktimoti with a percentage of 3.41%, @humaspralon with a percentage of 3.41%, @jefri_tftt with a percentage of 3.41%. Here are the top 10 account accounts (@Username) that most often voice (tweets) against covid-19 on Twitter Indonesia. The account (@Username) that is most often tweets against covid-19 on Twitter as shown in figure 2 is @polres_karimun (18.18%), as the account with the highest percentage of #lawancovid19.

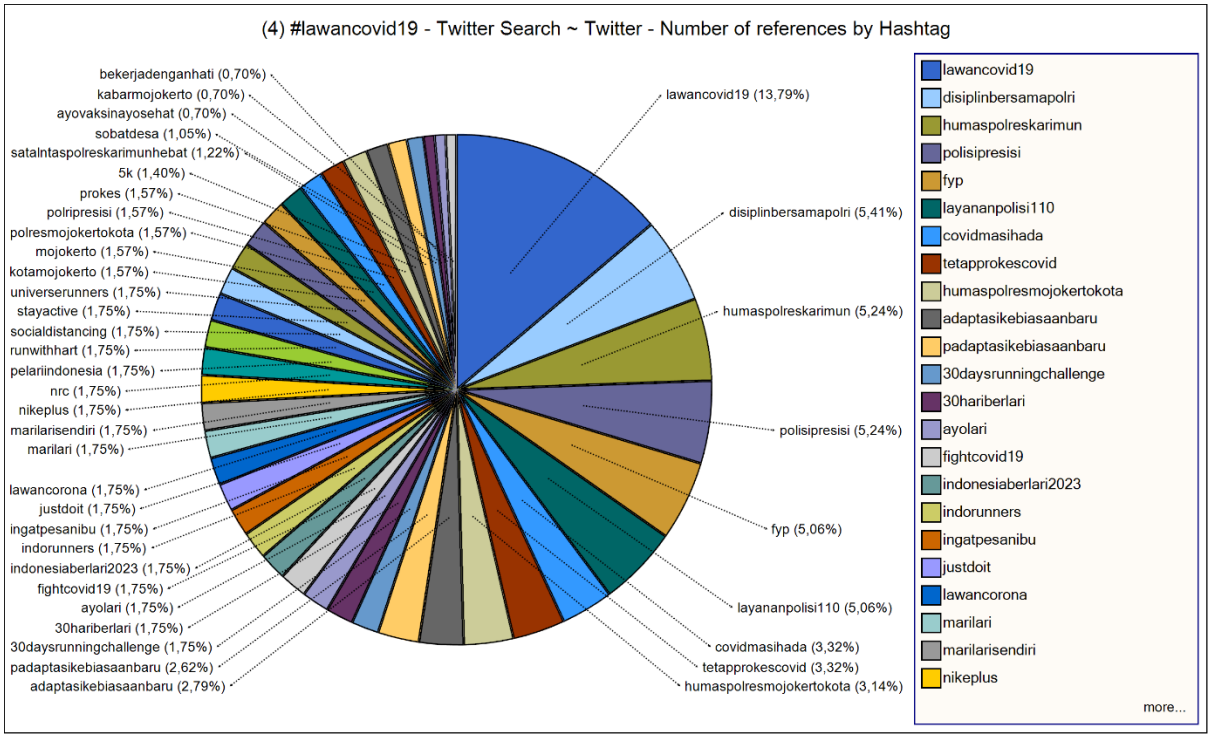


**Figure 3.** *The hashtags that most intersect with #lawancovid19 hashtags on Twitter. Source: Analyzed via Nvivo 12 Pro, 2023*

Figure 3 shows that the information spread on Twitter in campaigning against covid-19 identified with the hashtag #lawancovid19 brings up some of the keywords that most intersect as follows, namely the hashtag #disiplinbersamapolri with a percentage of 5.41%, the hashtag #humaspolreskarimun with a percentage of 5.24%, the hashtag #polisipresisi with a percentage of 5.245, the hashtag #fyp with a percentage of 5.06%, the hashtag #layananpolisi110 with a percentage of 5.06%, Hashtags #covidmasihada with a percentage of 3.32%, hashtags #tetapprokescovid with a percentage of 3.32%, hashtags #humaspolresmojokertokota with a percentage of 3.14%, hashtags #adaptasikebiasaanbaru with a percentage of 2.79%, hashtags #padaptasikebiasaanbaru with a percentage of 2.62%, etc. Here are the top 10 most tangential hashtags in digital networks campaigning against covid-19. It can be said that the hashtag #lawancovid-19 has relevance to several new hashtags that are still relevant in campaigning against covid-19 on Twitter to fight community and urban vulnerabilities in Indonesia.

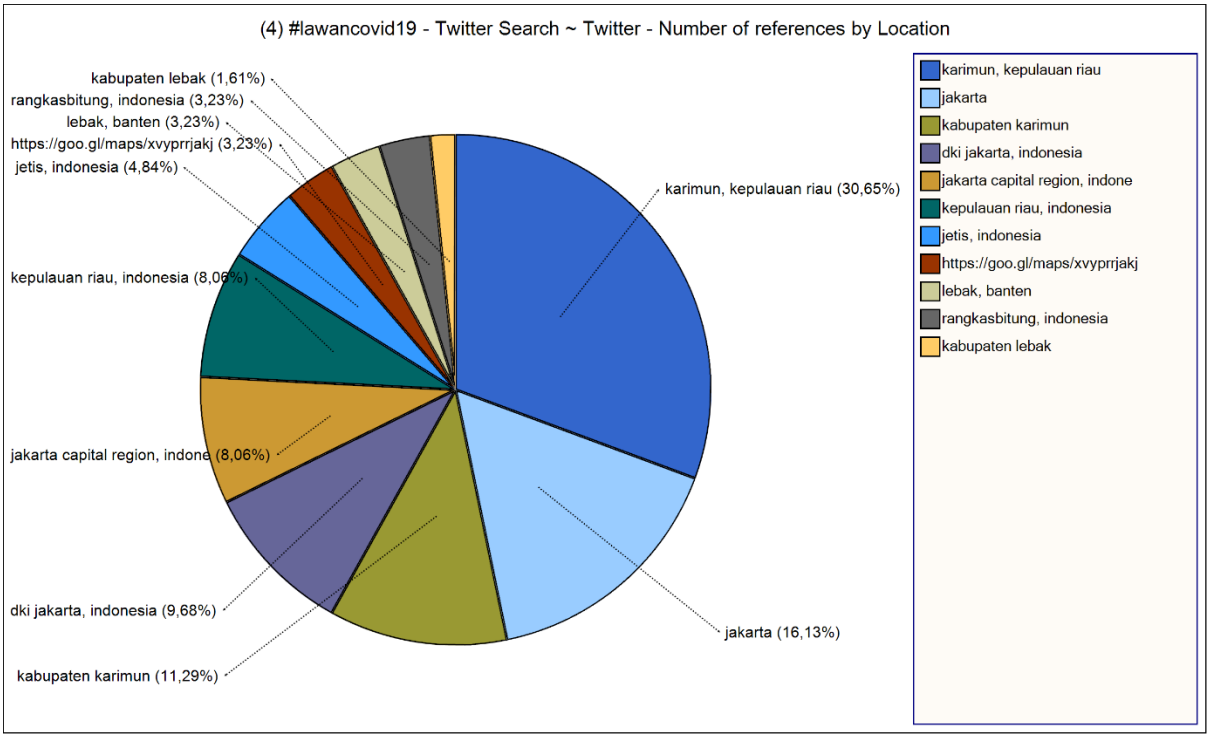


**Figure 4.** *The location that most often voices (tweets) about #lawancovid19 on Twitter. Source: Analyzed via Nvivo 12 Pro, 2023*

Figure 4 explained the dominant location, the location as the area that voiced the most (tweets) location regarding the action against covid-19 in Indonesia, and was found as much as 30.65% in Karimun, Riau Islands, then in Jakarta as much as 16.13%, Jetis area, Indonesia as much as 4.84%, Lebak area, Banten as much as 3.23%, Rangkasbitung area, Indonesia as much as 3.23% and in Lebak Regency as much as 1.61%. This is indicated that the connective actions and networks of the digital community to overcomeCovid-19 in Indonesia which are developing and spread on social media (Twitter) are mostly in the Karimun area, Riau Islands (30.65%), followed by the Jakarta area (16.13%) and the Jetis area, Indonesia (4.84%). So it can be said that many regions in Indonesia have not been detected in supporting action against covid-19 on Social Media (Twitter) in Indonesia. The analysis of social networks in this study saw that social relationships through the approach of collective action and collective action on social media are connected even though these actions have not yet spread in various regions.

**Other Forms of Hashtags Against Covid-19 (SARS-CoV-2) on Twitter in Indonesia: Hashtags #ayovaksi, #jagajarak and #ayopakaimasker**

Currently, digital media has a role in social movements in Indonesia (Bennett, W. L., & Segerberg, A., 2015). It is believed that the era of digital did not weaken the collective movement, because it made human beings more and more individual. The digital age cannot necessarily be considered to show that society is apolitical. It may also indicate that community participation is carried out in connected movements in the form of digital community action (Bennett, W. L., & Segerberg, A., 2015). The trend of #BersamaLawanCorona and #lawancovid19 hashtags on Twitter in which are crowded with tweets by several accounts (@username) on Twitter such as accounts from @polres_karimun, @bocahinfo, and @lantaskarimun_. With several hashtags alluded to and mentioned together such as #disiplinbersamapolri, #humaspolreskarimun hashtags, #polisipresisi hashtags, #fyp hashtags, #layananpolisi110 hashtags, #covidmasihada hashtags, and

t'#tetapprokescovid. Below are some of the most intersecting hashtags and tweets such as the #ayovaksi Hashtag, #jagajarak, and #ayopakaimasker in supporting and voicing the resistance to covid-19 in Indonesia. This can see trends and a positive stigma of the digital community of Twitter users in action against covid-19 on Twitter.

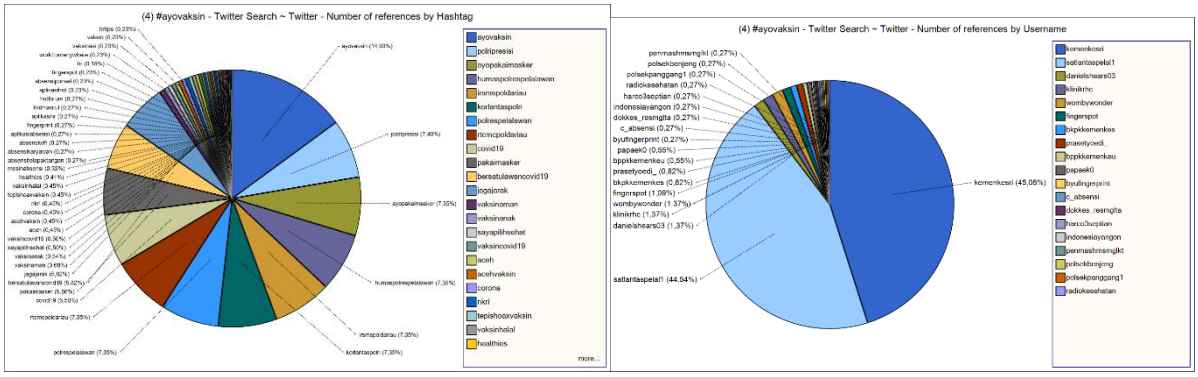


**Figure 5.** *The accounts (@Username) and Hashtags that most intersect with #ayovaksin hashtags on Twitter. Source: Analyzed via Nvivo 12 Pro, 2023*

Figure e 5 shows the accounts (@Username) and hashtags that most often voice (Tweets) about #lawancovid19 (together against corona) in Indonesia, here are the top 5 accounts (@Username) that voice (tweets) #ayovaksin namely @kemenkesri with a percentage of 45.08%, @satlantaspelal1 with a percentage of 44.54%, @danielshears03 with a percentage of 1.37%, @klinikrhc with a percentage of 1.37%, @wombywonder with a percentage of 1.37%, and @fingerspot with a percentage of 1.09%. In addition, here are the top 5 hashtags that are mostly decorated with #ayovaksin hashtags that support the action against covid-19 on Twitter, Indonesia, namely #ayovaksin with a percentage of 14.93%, #polripresisi with a percentage of 7.40%, #ayopakaimasker with a percentage of 7.35%, #humaspolrespelalawan with a percentage of 7.35%, #irsmspoldariu with a percentage of 7.35%, and #korlantaspolri with a percentage of 7.35%. This indicates that the #lawancovid19 (covid-19 opponent) information network is related to the mask-wearing campaign on Twitter, Indonesia.

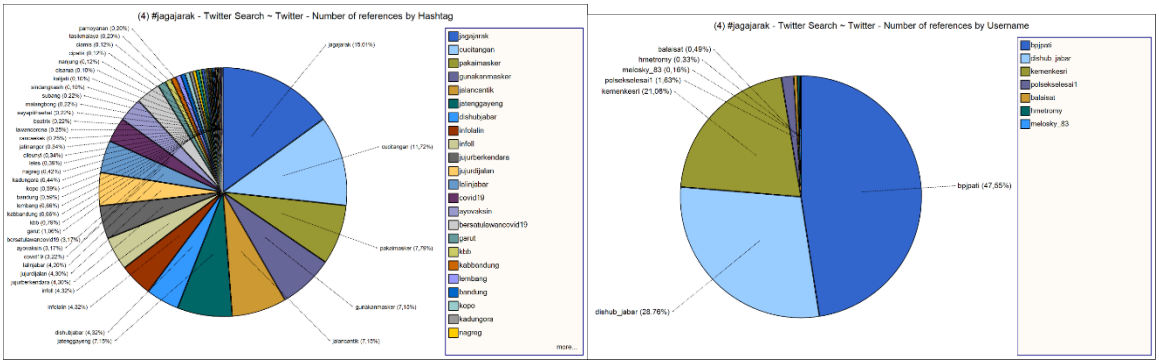


**Figure 6.** *Accounts (@Usernames) and Hashtags that most intersect with #jagajarak hashtags on Twitter. Source: Analyzed via Nvivo 12 Pro, 2023*

Figure 6 shows the accounts (@Username) and Hashtags that most often voice (Tweets) about #lawancovid19 (against corona) in Indonesia, here are the top 5 accounts (@Username) that voice (tweets) #jagajarak namely @bpjpati with a percentage of 47.55%, @dishub_jabar with a percentage of 28.76%, @kemenkesri with a percentage of 21.08%, @polsekselesai1 with a percentage 1.63%, @melosky_83 with a percentage of 0.16%, and @hmetromy with a percentage of

0.33%. In addition, here are the top 5 hashtags that are closest to the hashtag #jagajarak that support the action against covid-19 on Twitter, Indonesia, namely #jagajarak with a percentage of 15.01%, #cucitangan with a percentage of 11.72%, #pakaimasker with a percentage of 7.79%, #gunakanmasker with a percentage of 7.15%, #jalancantik with a percentage of 7.15%, and #jatenggayang with a percentage of 7.15%. This indicates that the #lawancovid19 information network (fight covid-19) is still related to social distancing tweets on Twitter.

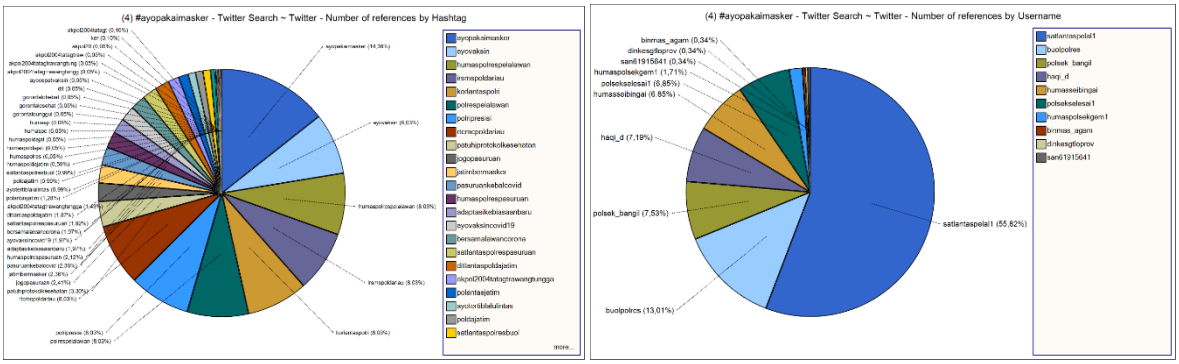


**Figure 7.** *The accounts (@Username) and Hashtags that most intersect with #ayopakaimasker hashtags on Twitter. Source: Analyzed via Nvivo 12 Pro, 2023*

Figure 7 shows the accounts (@Username) and Hashtags that most often voice (Tweets) about #lawancovid19 (together against corona) in Indonesia, here are the top 5 accounts (@Username) that voice (tweets) #ayopakaimasker namely @satlantaspe lal1 with a percentage of 55.82%, @buolpolres with a percentage of 13.01%, @polsek_bangil with a percentage of 7.53%, @haqi_d with a percentage of 7.19%, @humasseibingai with a percentage of 6.85%, and @polsekselesai1 with a percentage of 6.85%. In addition, here are the top 5 hashtags that are closest to the hashtag #ayopakaimasker that support the action against covid-19 on Twitter, Indonesia, namely #ayopakaimasker with a percentage of 14.38%, #ayovaksin with a presentation of 8.03%, #humaspolrespelalawan with a percentage of 8.03%, #irsmspoldariau with a percentage of 8.03%, #korlantaspolri with a percentage of 8.03%, and #polrespelalawan with a percentage of 8.03%. This indicates that the #lawancovid19 information network (against covid-19) is still related to the campaign (tweets) of the let's wear a mask on Twitter, Indonesia.

## Discussions

Machine learning plays a role in fighting viruses, especially in the playback, prediction, and vaccines distributed by various social media accounts on Twitter. It can help fight the virus with a comprehensive survey of algorithms and ML models used in Covid-19 Exploration (SARS-CoV-2) on Twitter. The study shows that resistance advocates are more likely to retweet other users, whereas non-supporters are more likely to include URLs from external sources and generate unique tweets such as hashtags #lawancovid19, #BersamaLawanCorona, #ayovaksi, #jagajarak, and #ayopakaimasker. Collectively, these characteristics suggest that protest advocates have a more focused, consistent, and diffuse discourse in protests against COVID-19 social distancing requirements (SARS-COV-2) than non-supporters, which are more diverse in their critique of the liberation movement, and often more pervasive in terms of public support actions Tan. This is important in the context of assessing messages and communications in the overall social media (Twitter) communication activity in response to online countermeasures in support of public health and to tackle the global pandemic globally.


**Figure 8.** *Identification and analysis of hashtags regarding the action of the digital community against Covid-19 in Indonesia. Source: Processed through Nvivo 12 Pro*

The social media movement (as identified in figure 8) in encouraging community resilience and urban resilience through digital communication against Covid-19 (SARS-CoV-2) has dominantly succeeded in shaping understanding, behavior, and prudence in interacting directly in public spaces. Such collective behavior is motivated by an efficient and reliable stream of evidence-based information, #lawancovid19 keywords highlighting that segments of the population may have their knowledge, perceptions, and behaviors influenced by social dynamics that are directly opposed to the necessary public health measures. Several studies state that the fight against negative stigma and the correct socialization of health to fight Covid-19 can increase urban resilience in Indonesia (Afrin, S. et al., 2021; Lak, A. et al., 2020; Meagher, K. et al., 2021; Cheshmehzangi, A., 2020).

## Conclusion

ML (Machine Learning) plays a role in fighting the virus, especially looking at it from the perspective of screening, forecasting, and vaccines spread across various social media accounts on Twitter. Through a comprehensive survey of ML algorithms and models used in the Covid-19 (SARS-CoV-2) development expedition on Twitter, it can help fight the virus. Collectively, characteristics such as Tagar #ayovaksi, #jagajarak, and #ayopakaimasker support the resistance to covid-19 in Indonesia the account (@Username) that is most often @mention in the action against covid-19, namely the account of the @jokowi (President of Indonesia). The social media (Twitter) movement in encouraging community resilience and urban resilience through digital communication against Covid-19 (SARS-CoV-2) has been dominant in shaping understanding, behavior, and prudence in interacting directly in public spaces. This is assessed through messages and communication in the

overall social media communication activity (Twitter) through the hashtag #lawan vid19 in response to online countermeasures in support of public health and to overcome the problem of the global pandemic digitally. This research contributes to providing insights into the dynamics of communication against Covid-19 (SARS-CoV-2) on Social Media (Twitter) and supporting public health efforts and supporting urban resilience in Indonesia. We recommend further research to focus on linking the use of social media to the needs of information on each social media platform. Therefore, further research can examine other social media that affect information needs apart from Twitter social media.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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