

# Relationship Between Covid-19 Risk Category and Community Knowledge About Covid-19 Transmission Levels with Preventive Behavior of Covid-19 Transmission

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## Relationship Between Covid-19 Risk Category and Community Knowledge About Covid-19 Transmission Levels with Preventive Behavior of Covid-19 Transmission

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### Abstract

**Background:** The high rate of COVID-19 transmission in Indonesia has had a tremendous impact on various sectors of people's lives. The government has established a group of COVID-19 risk criteria in the regions based on color zoning which is assessed based on the level of transmission. Changes in community behavior become very crucial to reduce the spread of the virus. This study aimed to analyze the relationship between COVID-19 risk categories and public knowledge about the level of COVID-19 transmission with preventive behavior. This was an analytical study with a cross-sectional design, which conducted in East Java, Indonesia, May-July 2021. A sample of 384 people was selected using stratified random sampling. COVID-19 transmission preventive behavior is influenced by COVID-19 risk categories ( $b = -0.70$ , 95% CI =  $-1.15$  to  $-0.25$ ,  $p = 0.002$ ) and public knowledge ( $b = 1.06$ , 95% CI =  $0.33$  to  $1.79$ ,  $p = 0.005$ ). The COVID-19 risk categories and public knowledge about the COVID-19 transmission have a significant relationship with the COVID-19 transmission preventive behavior.

**Keywords:** Risk category, COVID-19, Knowledge, COVID-19 transmission prevention

### Introduction

Since the first outbreak of the acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in Wuhan, Hubei, China in December 2019, it has now become a pandemic by the World Health Organization (WHO) in more than 200 countries and regions worldwide by the increasing

incidence of the virus.<sup>1,2</sup> The spread of Covid-19 has resulted in a global public health crisis. More than 10 million people from around the world have contracted COVID-19, and have caused more than 500,000 deaths.<sup>3</sup> The presence of risk factors infected with the Covid-19 virus and the high rate of human-to-human transmission, so the

COVID-19 outbreak is defined as an international public health emergency.<sup>3</sup> Preventive measures to bring the COVID-19 pandemic under control, and multiple platforms for communicating guidelines at different levels of effectiveness are needed.<sup>3</sup>

The success or failure of the government efforts to combat COVID-19 largely depends on people's behavior.<sup>4</sup> In particular, public compliance with the preventive measures established by the government is of vital importance to prevent the spread of the virus. Compliance is likely to be influenced by people's knowledge and attitudes towards COVID-19.<sup>5</sup> Evidence shows that public knowledge plays a pivotal role in coping with a pandemic.<sup>6</sup> By assessing public awareness and knowledge about the coronavirus, deeper insights into existing public perceptions and practices can be obtained, thereby helping to identify aspects that influence society in adopting healthy and responsive behaviors. Examining public knowledge is also of significance in identifying gaps and strengthening preventive measures.<sup>7</sup>

A lack of knowledge is associated with a panic buyer or people who buy goods more than their needs fear of pandemic-induced scarcity.<sup>8,9</sup> In addition, people with low levels of knowledge tended to attend gatherings of

more than 50 people, and resist to use medical masks outside the home. In addition, there is stark discrepancy in knowledge about COVID-19 based on age groups.<sup>10,11</sup> In fact, contrary to recent media, baby boomers in one study were more knowledgeable about COVID-19 than all other age groups and were less likely to engage in panic-buying behavior. In general, people who did not engage in this behavior had significantly higher knowledge scores. People involved in large gatherings and wear masks in public are, on average, younger than those who do not.<sup>12,13</sup>

Knowledge, attitudes and behavior towards COVID-19 play an important role in determining the readiness of the public to accept behavioral changes from the health authorities.<sup>14</sup> The knowledge, attitude, and practices (KAP) study provides basic information to implement the types of interventions required to change the widespread misconceptions about the virus. The assessment of public's knowledge, attitudes and behaviors related to COVID-19 will be of great help to provide better insights for overcoming misleading knowledge about the virus and the development of prevention strategies and health promotion programs.<sup>15</sup> The level of knowledge clearly reflects the

individual behavior as a basis to act properly.<sup>16</sup>

In Indonesia, many people blame the low level of public compliance with instructions from the government to guard against exposure to the coronavirus. Apparently, almost all of them wore masks and followed health protocols to wash their hands regularly, but there are also some people who are not disciplined in implementing health protocols. Risk zone maps showing the distribution of Covid-19 transmission in various areas are based on valid data. Areas that are currently not in the red zone or at high risk, were asked not to be caught off guard. Even those in the orange zone cannot feel safe because the Covid-19 transmission continues to occur. Based on this fact, researchers want to analyze the relationship between COVID-19 risk categories and public knowledge about the level of COVID-19 transmission with preventive behavior.

### Material & Methods

This was an analytical study with a cross-sectional design conducted in East

Java, Indonesia in May-July 2021. The sample selected using stratified random sampling. A sample of 384 people was selected using stratified random sampling. Samples were taken based on the level of the virus spread zone in a stratified and random basis. Each area of the COVID-19 spread zone requires 96 samples. The dependent variable in this study is the behavior of preventing the transmission of COVID-19. The independent variables include risk and knowledge categories. To collect the data, the study used questionnaire distributed online in each region. The collected data were then analyzed using multiple linear regressions.

## Results

### 1. Sample Characteristics

Table 1 shows that the most dominant age in this study was 17-25 years old (43.5%). Most of the research sample had diploma education (57%) and the dominant work status is private (33.3%).

**Table 1. Sample Characteristics**

Characteristics	Criteria	n	%
Age	17-25	167	43.5
	26-35	123	32

	36-45	94	24.5
Sex	Male	165	43
	Female	219	57
Education	High School	121	31.5
	Diploma	125	32.6
	Bachelor	112	29.2
Occupation	Masters	26	6.7
	Jobless	56	14.6
	Private	128	33.3
	Self-employed	102	26.6
Zones	Civil Servant	98	25.5
	Green Zone	96	25
	Yellow Zone	96	25
	Orange Zone	96	25
	Red Zone	96	25

## 2. Multivariate Analysis

Table 2 below illustrates that the risk categories for COVID-19 (b = -0.70, 95% CI

= -1.15 to -0.25, p = 0.002) and public knowledge (b = 1.06, 95% CI = 0.33 to 1.79, p = 0.005) has a significant relationship with COVID-19 transmission preventive behavior.

**Table 2. Multivariate Analysis**

Independent Variable	b	CI 95 %		p
		Lower limit	Upper limit	
Risk Categories	-0.70	-1.15	-0.25	0.002
Knowledge	1.06	0.33	1.79	0.005

Number of samples = 384  
Adjusted R-Squared = 0.38  
p = <0.001

## Discussion

From the study results, it was found that the risk category of the Covid-19 region which is divided into 4 zones, including green, yellow, orange and red zones have a significant relationship with COVID-19 transmission preventive behavior (p= 0.002), however the correlation value indicates a negative relationship. This means that the

higher the covid-19 zone, the behavior to prevent Covid-19 transmission will decrease. This is related to policies that regulate community activities in each covid-19 zone area. So that people can feel boredom of the strict regulations that apply in their area.

For example, the form of implementation in the red zone that has been established by the Ministry of Health is that

the public must be at home, not allowed to travel, not allowed to hold meetings, public places are closed, business activities are closed except for essential purposes (pharmacy, supermarket of staple goods, clinics, and gas stations). In addition, educational facilities were closed and distance education was implemented.

From the study results also obtained that knowledge has a significant correlation with COVID-19 transmission preventive behavior ( $p=0.005$ ) and the correlation value indicates a positive relationship. It means that better the level of public knowledge, the behavior to prevent the transmission of Covid-19 will increase. The community knowledge is quite good because the government's efforts to provide socialization about Covid-19 are intensively carried out. In addition, the independence of the community in accessing information that is currently easy to reach also affects knowledge. However, it is necessary to be aware of the spread of hoax news that is easily accepted by the public without first proving the truth.

The management of COVID-19 has detailed four levels of regional zoning criteria based on color, as an indicator of the risk categories for COVID-19 as seen from the level of transmission. Some of the criteria for this area are green zone (not affected), yellow

zone (low risk), orange zone (medium risk), and red zone (high risk).

However, according to the COVID-19 National Task Force, data on the spread of COVID-19 is very dynamic. Therefore, there are areas that might not have been affected previously, but which could have turned into areas with low risk. Likewise, there are areas with low risk that can move into a moderate risk zone, or vice versa.

In the red zoned areas, the transmission rate of the COVID-19 is very fast. Its characteristic feature is that there is local spread of the corona virus among people in one area, and the outbreak is spreading widely creating many new clusters in the area. In areas with an orange zone, the transmission rate is still high. Local transmission and transmission from imported cases may occur quickly, and new clusters must be monitored and controlled through aggressive testing and tracing. In areas with the yellow zone, the possibility of local transmission is still quite large and possibly fast, transmission from imported cases can occur quickly, transmission at the household level may take place, and the cluster spread is controlled steadily. In areas with green zone status, there are no positive cases found with the COVID-19, the spread of the virus is controlled, the risk of spread remains in

isolation places, and strict and periodic control is carried out to prevent potential new cases.

The results of the present study reveal that the risk categories of COVID-19 and public knowledge about the transmission of the virus have a significant relationship with the behavior of preventing the transmission of COVID-19. The behavior of people in the red zone, as the highest zone of the risk category for COVID-19, shows that public awareness of preventive measures for the transmission of COVID-19 is still lacking, so the spread rate in the zone is getting higher. Meanwhile, the knowledge of the public about the level of transmission of COVID-19, the higher the knowledge they have, the more people will be aware of preventing the transmission of the virus. Proper strategies and education are needed in increasing public knowledge so that collaboration between the community and the government can be created in breaking the chain of COVID-19 transmission.

The Clean and Healthy Behavior (PHBS) of the community before the COVID-19 pandemic, which consists of washing hands using soap, consuming healthy food, physical activity, adequate rest, clean water, proper sanitation, not smoking, etc. are still low. When the COVID-19

pandemic occurred, Indonesians who had various social characteristics, ranging from age groups, education level, economic status, exposure to the internet / mass media, social environment, culture, ethnicity, and others, had an understanding and attitudes. various aspects of the COVID-19 pandemic. The understanding and attitudes that are formed can influence people's actions / behavior. Not all community members adhere to health protocols.

The most effective strategy for the prevention of future COVID-19 outbreaks will be the development of vaccines to prevent infection and to provide immunity to people. Many research groups have researched potential vaccines and are in a clinical phase; however, there is still much work to be done.<sup>17,18</sup> Therefore, for now, we need to apply basic disciplines such as hand hygiene, cough etiquette, wearing masks, avoiding close contact with people who show symptoms of respiratory disease, and contact doctors when feeling unwell.

Many countries have imposed stay-at-home orders, lockdowns, quarantine, and physical distancing as the very important measures to prevent further transmission of the COVID-19 infection.<sup>19,20,21</sup> Therefore, it is advisable to avoid crowded public places and to maintain one-meter distance from

other people, especially if you are around the sick people. Elderly individuals and those with comorbidities need extra care, and they should also avoid unnecessary travel. Washing your hands frequently for at least 20 seconds is the best way to protect yourself and those around you.<sup>22,23</sup>

Relatively high rates of transmission and low levels of behavior change have led to large-scale transmission of COVID-19.<sup>24,25</sup> Behavior change is one of the main public health control mechanisms for reducing contact rates effectively (so-called non-pharmaceutical interventions). However, when dealing with behavioral problems, we enter the psychological realm of individuals.<sup>26</sup> Across the country, citizens are making hand washing a habit of their daily life. In offices and public facilities where a number of people come and go, hand sanitizers have been prepared so that people can use them freely and routinely.<sup>27</sup>

<sup>6</sup> In terms of knowledge and behavior, evidence has shown that awareness of the disease and the attitudes of people in society play a major role in shaping behavior and controlling its transmission during the outbreak.<sup>28,29</sup> <sup>6</sup> Numerous empirical studies have also demonstrated that health education can increase knowledge and change unfavorable behaviors by effectively limiting

infectious diseases and epidemics. To date, the public has limited knowledge and beliefs regarding COVID-19. Given that knowledge related to COVID-19 and public health beliefs during disease outbreaks are critical, it is important to provide better insights in overcoming knowledge and belief gaps related to this virus.<sup>30,31</sup>

The Indonesian government, through the Ministry of Health, has published a behavior change communication guide <sup>3</sup> in the prevention and control of COVID-19. This communication guide has a central role in accelerating the public knowledge and changing people's behavior regarding COVID-19. A comprehensive risk communication strategy will harmonize and strengthen the COVID-19 prevention and control programs in Indonesia at levels of the society. Increasing knowledge and skills for each target group in terms of prevention and control of COVID-19 is important. With increased knowledge of 3 key messages, namely Washing Hands with Soap with Running Water, Coughing Ethics and Keeping Distance, it is hoped that the target group can make behavioral changes that support and accelerate the prevention and control of the virus.

Ultimately, this communication guide will increase the participation of the



community, consisting of social organizations, industries, Higher Education, and policy makers in supporting the COVID-19 control program and placing it as the key issue in all sectors. Besides, it serves as an effort to disseminate COVID-19's information to the public to increase the awareness of the prevention of COVID-19 transmission.

### Conclusion

COVID-19 transmission preventive behavior has a significant relationship with the COVID-19 risk categories and public knowledge about the level of COVID-19 transmission. The government, through the Ministry of Health, has also built cross-sectoral cooperation to take part in various prevention and control measures in suppressing the increasing cases simultaneously in various fields. One of them is to carry out public education of how the virus is transmitted. Therefore, the role of all elements of society is very significant in enforcing the PHBS and complying with the health protocols.

**Conflicts of Interest:** There was no conflict of interest in this study.

**Ethical Clearance:** Research subject consent was taken

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### References

1. Chakraborty I, Maity P. COVID-19 outbreak: Migration, effects on society, global environment and prevention. *Sci Total Environ.* 2020 Aug;728:138882.
2. Steffens I. Editorial A hundred days into the coronavirus disease (COVID-19) pandemic. *Eurosurveillance.* 2020;25(14):1–4.
3. Rose-Redwood R, Kitchin R, Apostolopoulou E, Rickards L, Blackman T, Crampton J, et al. Geographies of the Covid-19 Pandemic. *Dialogues Hum Geogr.* 2020;10(2):97–106.
4. Micarelli A, Granito I, Carlino P, Micarelli B, Alessandrini M. Self-perceived general and ear-nose-throat symptoms related to the COVID-19 outbreak: a survey study during quarantine in Italy. *J Int Med Res.* 2020;48(10).
5. Almofada SK, Alherbisch RJ, Almuhraj NA, Almeshary BN, Alrabiah B, Al Saffan A, et al.

- Knowledge, Attitudes, and Practices Toward COVID-19 in a Saudi Arabian Population: A Cross-Sectional Study. *Cureus*. 2020 Jun;12(6):e8905.
6. Weible CM, Nohrstedt D, Cairney P, Carter DP, Crow DA, Durnová AP, et al. COVID-19 and the policy sciences: initial reactions and perspectives. *Policy Sci*. 2020;53(2):225–41.
  7. Salman M, Mustafa ZU, Asif N, Zaidi HA, Hussain K, Shehzadi N, et al. Knowledge, attitude and preventive practices related to COVID-19: a cross-sectional study in two Pakistani university populations. *Drugs Ther Perspect Ration drug Sel use*. 2020 May;1–7.
  8. Preti E, Di Mattei V, Perego G, Ferrari F, Mazzetti M, Taranto P, et al. The Psychological Impact of Epidemic and Pandemic Outbreaks on Healthcare Workers: Rapid Review of the Evidence. *Curr Psychiatry Rep*. 2020;22(8).
  9. Al-Hanawi MK, Angawi K, Alshareef N, Qattan AMN, Helmy HZ, Abudawood Y, et al. Knowledge, Attitude and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study. *Front public Heal*. 2020;8:217.
  10. Arafat SMY, Kar SK, Marthoenis M, Sharma P, Hoque Apu E, Kabir R. Psychological underpinning of panic buying during pandemic (COVID-19). *Psychiatry Res*. 2020;289(May):113061.
  11. Yuen KF, Wang X, Ma F, Li KX. The Psychological Causes of Panic Buying Following a Health Crisis. *Int J Environ Res Public Health*. 2020 May;17(10).
  12. Olaimat AN, Aolymat I, Shahbaz HM, Holley RA. Knowledge and Information Sources About COVID-19 Among University Students in Jordan: A Cross-Sectional Study. *Front public Heal*. 2020;8:254.
  13. Goruntla N, Bhupalam P, Jinka DR, Thummala J, Dasari LY, Bonala KK. Knowledge, Perception, and Practices towards COVID-19 Pandemic among General Public of India: A Cross-sectional online survey. *Curr Med Res Pract*. 2020;10(4):153–9.
  14. Clements JM. Knowledge and Behaviors Toward COVID-19 Among US Residents During the Early Days of the Pandemic: Cross-Sectional Online Questionnaire. *JMIR public Heal Surveill*. 2020 May;6(2):e19161.
  15. Lins S, Aquino S. Development and

- initial psychometric properties of a panic buying scale during COVID-19 pandemic. *Heliyon*. 2020;6(9):e04746.
16. Sari DK, Amelia R, Dharmajaya R, Sari LM, Fitri NK. Positive Correlation Between General Public Knowledge and Attitudes Regarding COVID-19 Outbreak 1 Month After First Cases Reported in Indonesia. *J Community Health*. 2020 Jun;1–8.
  17. Azlan AA, Hamzah MR, Sern TJ, Ayub SH, Mohamad E. Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *PLoS One*. 2020;15(5):e0233668.
  18. Hussain I, Majeed A, Imran I, Ullah M, Hashmi FK, Saeed H, et al. Knowledge, Attitude, and Practices Toward COVID-19 in Primary Healthcare Providers: A Cross-Sectional Study from Three Tertiary Care Hospitals of Peshawar, Pakistan. *J Community Health*. 2020 Jul;1–9.
  19. Kaur SP, Gupta V. COVID-19 Vaccine: A comprehensive status report. *Virus Res*. 2020;288(January).
  20. Deb B, Shah H, Goel S. Current global vaccine and drug efforts against COVID-19: Pros and cons of bypassing animal trials. *J Biosci*. 2020;45(1).
  21. Thu TPB, Ngoc PNH, Hai NM, Tuan LA. Effect of the social distancing measures on the spread of COVID-19 in 10 highly infected countries. *Sci Total Environ*. 2020 Jun;742:140430.
  22. Kucharski AJ, Klepac P, Conlan AJK, Kissler SM, Tang ML, Fry H, et al. Effectiveness of isolation, testing, contact tracing, and physical distancing on reducing transmission of SARS-CoV-2 in different settings: a mathematical modelling study. *Lancet Infect Dis*. 2020;20(10):1151–60.
  23. Modesti PA, Wang J, Damasceno A, Agyemang C, Van Bortel L, Persu A, et al. Indirect implications of COVID-19 prevention strategies on non-communicable diseases: An Opinion Paper of the European Society of Hypertension Working Group on Hypertension and Cardiovascular Risk Assessment in Subjects Living in or Emigrating from Low R. *BMC Med*. 2020;18(1):256.
  24. Beiu C, Mihai M, Popa L, Cima L, Popescu MN. Frequent Hand Washing for COVID-19 Prevention Can Cause Hand Dermatitis: Management Tips. *Cureus*. 2020 Apr;12(4):e7506.
  25. World Health Organization., World

- Bank., Ruiz-Ibán MA, Seijas R, Sallent A, Ares O, et al. No 主観的健康感を中心とした在宅高齢者における健康関連指標に関する共分散構造分析Title. *Osteoarthritis Cartilage*. 2020;28(2):1–43.
26. Kim S, Seo Y Bin, Jung E. Prediction of COVID-19 transmission dynamics using a mathematical model considering behavior changes in Korea. *Epidemiol Health*. 2020;42:e2020026.
  27. Coccia M. Factors determining the diffusion of COVID-19 and suggested strategy to prevent future accelerated viral infectivity similar to COVID. *Sci Total Environ*. 2020 Aug;729:138474.
  28. Acuña-Zegarra MA, Santana-Cibrian M, Velasco-Hernandez JX. Modeling behavioral change and COVID-19 containment in Mexico: A trade-off between lockdown and compliance. *Math Biosci*. 2020 Jul;325:108370.
  29. Shaw R, Kim Y, Hua J. Governance, technology and citizen behavior in pandemic: Lessons from COVID-19 in East Asia. *Prog Disaster Sci*. 2020;6:100090.
  30. Yi Y, Lagniton PNP, Ye S, Li E, Xu R-H. COVID-19: what has been learned and to be learned about the novel coronavirus disease. *Int J Biol Sci*. 2020;16(10):1753–66.
  31. Hsu CH, Lin HH, Wang CC, Jhang S. How to defend covid-19 in taiwan? Talk about people’s disease awareness, attitudes, behaviors and the impact of physical and mental health. *Int J Environ Res Public Health*. 2020;17(13):1–23.
  32. Lin Y, Hu Z, Alias H, Wong LP. Knowledge, Attitudes, Impact, and Anxiety Regarding COVID-19 Infection Among the Public in China. *Front public Heal*. 2020;8:236.
  33. Peng M. Outbreak of COVID-19: An emerging global pandemic threat. *Biomed Pharmacother*. 2020;129:110499.

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