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Analysis of the Relationship between Health Protocols and the Event of Coronavirus Disease 2019 (COVID-19) in Mandailing Natal Regency in 2021

Rahmadani[1], Fazidah Aguslina Siregar[2], R. Kintoko Rochadi[3]
[1,2,3]*University of Sumatera, Indonesia*
rahmadanisinaga415@gmail.com

Abstract

The purpose of this study was to determine and analyze the relationship between health protocols and the event of coronavirus disease 2019 (COVID-19) in Mandailing Natal Regency in 2021. This type of research was a quantitative analytic survey with a case-control design. The population in this study were residents of Mandailing Natal Regency aged 16-55 years who were new cases or old cases who had participated in the swab polymerase chain reaction (PCR) test with positive or negative results with the final result of recovering alive recorded under the supervision of the COVID-19 Task Force (July-November 2021). Based on the sample calculation, the minimum sample size obtained is 27 people for the case sample and 27 people for the control. So the minimum total sample is 54 respondents with a ratio of one to one (1:1). Data processing is carried out with the stages of editing, coding, entry, and cleaning before data analysis is carried out, then checks and repairs are carried out. Data analysis used bivariate analysis. The results showed that the health protocols category for the use of mask obtained p-value=0.036, meaning that there has relationship between the use of mask and the incidence of COVID-19. Washing hand with soap has no relationship with the incidence of COVID-19 with p-value=0.781. Maintaining a minimum distance of 1 meter has no relationship with the incidence of COVID-19 with a p-value=0.739. Limiting activities outside the home has relationship with the incidence of COVID-19 with a p-value=0.034. The category away from the crowd has relationship with the incidence of COVID-19 with a p-value=0.002.

Keywords
health protocols; covid-19; mask; washing hand; distance

I. Introduction

Coronaviruses are a large family of viruses that cause disease in humans and animals. In humans it usually causes respiratory tract infections, this virus belongs to the betacoronavirus group, said to be a coronavirus because the shape of this virus is like a crown that has glycoprotein protrusions. This virus can be transmitted through direct contact with droplets in the respiratory tract of an infected person (coughing and sneezing) and can survive for days on surface objects (Khafaie and Rahim, 2020).

Entering 2020, the coronavirus disease 2019 (COVID-19) has become a serious threat to global public health (Zhang et al, 2020). The beginning of the COVID-19 virus infection came from China, precisely in Wuhan City at the end of December 2019, the World Health Organization (WHO) China Country Office reported a case of pneumonia of unknown etiology. Many cases of pneumonia that occur are closely linked to the market in the city of Wuhan. After conducting an investigation of the market, WHO found a new type of corona virus obtained from samples taken from the market, and the virus was

named novel coronavirus, but there is no definite evidence of the mechanism of transmission of the virus. Finally, on March 11, 2020, WHO COVID-19 became an extraordinary event and became a global pandemic.

Since the first case was found, this increase in pneumonia rates has continued to occur, COVID-19 cases in China every day and increasing from late January to early February 2020. Initially reports were dominated by Hubei and its surroundings, then continued to grow and spread to other provinces throughout China. As of January 30, 2020, there were 7,736 confirmed cases of COVID-19 in China, and another 86 cases were reported from various other countries such as Taiwan, Vietnam, Malaysia, Nepal, South Korea, Philippines, India, Australia, Canada, Finland, France and Germany (World Health Organization, 2020).

In Indonesia, the first COVID-19 cases were reported on March 2, 2020, as many as two cases. Then on March 31, 2021, it showed an increase in cases, namely 1,528 confirmed cases with 136 deaths. The mortality rate for COVID-19 in Indonesia has reached 8.9 percent, which is the highest number in Southeast Asia (Kementerian Kesehatan, 2020).

The addition of cases continued to increase until on November 28, 2020 it reached 5,418 cases, which is the highest case since it was discovered in Indonesia. The total number of reported cases was 522, 581 with 68,604 active cases and 16,521 deaths with 437,456 recoveries (Ministry of Health, 2020)

Update on the COVID-19 data in North Sumatra on September 1, 2020, there were 784 suspects, with a total of 6,942 positive confirmed cases and 319 deaths. The increase in cases continued to occur, on September 5 positive confirmed cases in North Sumatra reached 7,552 cases with the number of deaths reaching 334 cases.

Mandailing Natal is one of the districts in North Sumatra. In August 2020 there was a drastic change in the status of the Madina Regency area based on the number of COVID-19 cases from the green zone to the orange zone. The number of cases found as of October 6 was confirmed to be 109 positive cases with 296 close contacts. Of these, the most cases were found in Panyabungan District as many as 70 cases, there were three people in North Panyabungan District, 13 people in West Panyabungan, and 1 person in Lembah Sorik Marapi District, 2 people in Puncak Sorik Marapi District, 3 cases in Lingga Bayu District, 1 case in Batang Natal District, and 2 cases in Muara Batang Gadis District.

Then in December Mandailing Natal Regency was declared to have almost zero confirmed cases, but from April to August the spread of cases increased again so that Mandailing Natal Regency was included in the orange zone or moderate risk of COVID-19 transmission. Some areas in North Sumatra that are included in this zone include; Pakpak Bharat, Samosir, West Nias, Tanjung Balai, Tebing Tinggi, Labuhan Batu, Mandailing Natal, Serdang Bedagai, and Batu Bara District.

Update data on COVID-19 cases in the Mandailing Natal Regency area on August 30, as many as 525 positive cases, 462 recovered cases, 43 positive cases died, and 43 positive negative cases.

There are some mild symptoms that are defined as signs of this disease such as cases with symptoms of acute respiratory tract infection without complications, some accompanied by symptoms of fever, fatigue, anorexia, cough (with or without sputum), sore throat, headache and malaise. In some cases patients also have complaints such as diarrhea and vomiting (World Health Organization, 2020).

The pathology of the disease begins with a fairly long incubation period ranging from three to 14 days (mean 5 days). In this phase leukocytes and lymphocytes are still normal or slightly decreased and there are no symptoms. Next comes the initial symptoms,

where the virus spreads through the bloodstream, especially in ACE2-expressing tissues such as the heart, lungs and gastrointestinal tract. In this phase, patients generally experience mild symptoms. Then the second phase begins, ranging from the fourth to the seventh day after the initial symptoms appear. In this phase the patient has fever, shortness of breath, pulmonary lesions begin to worsen and lymphocytes decrease. Then inflammation begins to increase and hypercoagulation occurs. If it is not treated immediately in the next phase, the inflammation becomes increasingly uncontrolled, cytokines occur that cause ARDS, sepsis and other complications (Huang et al., 2020).

In the context of preventing and controlling COVID-19, the government has issued many policies that involve all levels of society. Since March 15, 2020, the President has asked the Regional Government to issue a study from home policy for students. This was confirmed by the President at a press conference at the Bogor Palace by calling for work from home, study from home, and worship at home. Since then, the government and all levels of society have been campaigning for social distancing (Kompas, 2020).

Handling cases that are still focused on prevention efforts require the community's conscious and voluntary participation in complying with the health protocols recommended by 5M in order to reduce the transmission rate. However, in reality there are still many people who do not heed these rules. The risk of being infected with COVID-19 is now more heavily borne by the individual, where compliance with applicable health protocols means that other risk factors such as immune status and comorbid diseases are the focus.

Case control, which focuses on prevention, makes this pandemic case the responsibility of all parties and requires real public attitudes and actions in complying with the health recommendations that have been made. However, people have different responses in responding to this. Some people voluntarily comply with government recommendations because of awareness of the importance of health. However, there are also people who implement government regulations only because they are forced or because of sanctions if they do not comply.

An initial survey was conducted on 30 patients who visited the Panyabungan Jae Community Health Center to see an overview of the implementation of health protocols in the community during the COVID-19 pandemic. From the results of a survey conducted by 17 people (56%) paying attention to hand hygiene independently and the rest washing their hands because they were directed by community health center officers, 11 people (55%) consumed water more often than before the pandemic. 19 people (63%) admitted that they were used to wearing masks, some said they were uncomfortable and uncomfortable using masks for too long and only used them when they were in required places such as public facilities. 23 people (76%) did not pay much attention to social distancing, some admitted that they had worn masks so they felt safe. This shows that compliance with health protocols by the community is dominated by regulations for public places that are supervised and require it.

The purpose of this study was to determine and analyze the relationship between health protocols and the event of coronavirus disease 2019 (COVID-19) in Mandailing Natal Regency in 2021.

II. Research Method

This type of research was a quantitative analytic survey with a case-control design. This type of research is a quantitative analytic survey with a case-control design. An analytical survey is a survey or research that tries to explore how and why health phenomena occur (Octiva et al., 2018). Then analyze the dynamics of the correlation between phenomena or between risk factors and effect factors (Octiva et al., 2021). With a cross sectional research design, which is a study to study the dynamics of the correlation between risk factors and effects, by approaching, observing or collecting data all at once (Pandiangan, 2015; Pandiangan, 2022). Case-control studies are often contrasted with cohort studies, in which exposed and unexposed research subjects are observed until they develop the desired research results (Pandiangan et al., 2021). Case-control studies were initially analyzed by testing whether there was a significant difference between the proportion of subjects exposed between cases and controls (Pandia et al., 2018).

The population is the total number of units or individuals whose characteristics are to be studied (Pandiangan, 2018). The population in this study were residents of Mandailing Natal Regency aged 16-55 years who were new cases or old cases who had participated in the swab polymerase chain reaction (PCR) test with positive or negative results with the final result of recovering alive recorded under the supervision of the COVID-19 Task Force (July-November 2021). The sample is part of the population studied in a study and the results will be considered a description of the original population, but not the population itself (Pandiangan et al., 2022). Based on the sample calculation, the minimum sample size obtained is 27 people for the case sample and 27 people for the control. So the minimum total sample is 54 respondents with a ratio of one to one (1:1). Sampling was done by purposive sampling. The sampling technique is carried out by purposive sampling, which is the selection of samples based on certain characteristics that are considered to have something to do with previously known population characteristics (Pandiangan et al., 2018).

Data processing is carried out with the stages of editing, coding, entry, and cleaning before data analysis is carried out, then checks and repairs are carried out. Data analysis used bivariate analysis. Bivariate analysis performed with logistic regression is an approach to making predictive models as well as linear regression (Tobing et al., 2018).

III. Results and Discussion

3.1 Overview of Research Locations

Mandailing Natal Regency is a district located in North Sumatra Province, located between 0 0100 - 1 0500 North Latitude and 980500 -1000100 East Longitude. Mandailing Natal Regency occupies an area of 662,069,99 Ha consisting of 23 sub-districts, 407 villages/kelurahan. The area of Mandailing Natal Regency is directly adjacent to South Tapanuli Regency and Padang Lawas Regency to the north, West Sumatra Province to the south and east, and the Indonesian Ocean to the west.

The population of Mandailing Natal Regency in 2020 is 472,886 people with a population density of 71 people per km2. The highest population is in Panyabungan District, which is 90,049 people and the smallest population is in Pakantan District, which is 2,222 people. The sex ratio is 99.19, which means that for every 100 female population, there are approximately 99-100 male residents.

The dependency ratio is a comparison between the total population aged 0-14 years, plus the population aged 65 years and over (both referred to as non-labor force) compared

to the total population aged 15-64 years (labor force). The burden of dependence can be used as an indicator that can roughly show the economic condition of a country whether it is classified as a developed country or a developing country. The burden of dependence is one of the important demographic indicators. The higher the percentage of the dependency burden indicates the higher the burden that must be borne by the productive population to finance the lives of the unproductive and unproductive population. Meanwhile, the lower percentage of the dependency burden indicates the lower the burden borne by the productive population to finance the unproductive and unproductive population.

In terms of age group, 30.96 percent of the population of Mandailing Natal Regency are aged 0-14 years, 64.56 percent of the population of Mandailing Natal Regency are 15-64 years old, while the population aged 65 years and over is only 4.48 percent. This shows that the population of productive age (age 15-64 years) is greater than the population of non-productive age (age 0-14 years and age 65+). The total population of productive age is 64.56 percent while the number of non-productive age is 35.44 percent. So, the dependency burden is 54.89 percent, meaning that every 100 people of productive age in Mandailing Natal Regency bear around 54 to 55 people of non-productive age.

Based on the results of the National Socio-Economic Survey in 2020, information was obtained that as many as 13.48 percent of the population of Mandailing Natal Regency experienced health complaints that resulted in their activities being disrupted or suffering from illness, meaning that 13 to 14 of 100 residents of Mandailing Natal Regency were sick. When viewed by gender, it is known that of the total female population in Mandailing Natal, 14.49 percent suffer from illness. While the male population who experienced illness was 12.43 percent. This shows that the percentage of the population who is sick is relatively not different between the female population and the male population.

In terms of age group, the population aged 65 years and over is the group of population who suffers the most pain during the last month and causes daily activities to be disrupted, which is 20.55 percent. This can be said to be reasonable because people aged 65 years and over are vulnerable to health problems. In this age group, the body's resistance to various types of diseases begins to decline so that many people suffer from both infectious and non-communicable diseases.

3.2 Bivariate Analysis

Bivariate analysis performed with logistic regression is an approach to making predictive models as well as linear regression. The difference is that in logistic regression, the researcher predicts the dependent variable on a dichotomous scale. The dichotomous scale in question is a nominal data scale with two categories, for example: yes and no, good and bad or high and low. The logistic regression test was carried out at the 95 percent confidence level to see which variables had an influence on the incidence of coronavirus disease 2019 (COVID-19) ($p\text{-value} < 0.05$). The results of the bivariate analysis test are as follows:

Table 1. Bivariate Test Results

Variable	Positive Confirmation		Negative		Total		p-value	OR	95% CI OR	
	n	%	n	%	n	%				
Mask										
Good	9	30	17	56.7	26	43.3	0.036	0.328	0.113	0.949
Not Good	21	70	13	43.3	34	56.7				
Washing Hand										
Good	10	33.3	9	30	19	31.7	0.781	1.167	0.393	3.461
Not Good	20	66.7	21	70	41	68.3				
Maintaining Distance										
Good	6	20	5	16.7	11	18.3	0.739	1.250	0.336	4.644
Not Good	24	80	25	83.3	49	81.7				
Limiting Activities										
Yes	11	36.7	4	13.3	15	25	0.034	3.763	1.038	13.646
No	19	63.3	26	86.7	45	75				
Away From the Crowd										
Yes	16	53.3	5	15.7	21	35	0.002	5.714	1.724	18.944
No	14	46.7	25	83.3	39	65				

The results showed that the health protocols category for the use of mask obtained p-value=0.036, meaning that there has relationship between the use of mask and the incidence of COVID-19. Washing hand with soap has no relationship with the incidence of COVID-19 with p-value=0.781. Maintaining a minimum distance of 1 meter has no relationship with the incidence of COVID-19 with a p-value=0.739. Limiting activities outside the home has relationship with the incidence of COVID-19 with a p-value=0.034. The category away from the crowd has relationship with the incidence of COVID-19 with a p-value=0.002.

IV. Conclusion

The results showed that the health protocols category for the use of mask obtained p-value=0.036, meaning that there has relationship between the use of mask and the incidence of COVID-19. Washing hand with soap has no relationship with the incidence of COVID-19 with p-value=0.781. Maintaining a minimum distance of 1 meter has no relationship with the incidence of COVID-19 with a p-value=0.739. Limiting activities outside the home has relationship with the incidence of COVID-19 with a p-value=0.034. The category away from the crowd has relationship with the incidence of COVID-19 with a p-value=0.002.

References

Huang B, Ling R, Cheng Y, Wen J, Dai Y, & Huang W. (2020). *Characteristics of the Coronavirus Disease 2019 and Related Therapeutic Options*.

Kementerian Kesehatan. (2020). *Informasi Tentang Virus Corona (COVID-19)*. Accessed on 18 Mei 2020, from http://promkes.kemkes.go.id/informasi-tentang-virus-corona-novelcoronavirus.

Khafaie, M. A., & Rahim, F. (2020). Osong Public Health and Research Perspectives Cross-Country Comparison of Case Fatality Rates. *Osong Public Health Res Perspective*, *11*(2), 74–80.

Kompas. (2020). *Apa itu PSBB Hingga Upaya Pencegahan COVID-19*. Accessed on https://www.kompas.

Octiva, C. S., Irvan, Sarah, M., Trisakti, B., & Daimon, H. (2018). Production of Biogas from Co-digestion of Empty Fruit Bunches (EFB) with Palm Oil Mill Effluent (POME): Effect of Mixing Ratio. *Rasayan J. Chem.*, *11*(2), 791-797.

Octiva, Cut Susan, Indriyani, & Santoso, Ari Beni. (2021). Effect of Stirring Co-digestion of Palm Oil and Fruith for Biogas Production to Increase Economy Benefit. *Budapest International Research and Critics Institute-Journal*, *4*(4), 14152-14160. DOI: https://doi.org/10.33258/birci.v4i4.3521.

Pandia, S., Tanata, S., Rachel, M., Octiva, C., & Sialagan, N. (2018). Effect of Fermentation Time of Mixture of Solid and Liquid Wastes from Tapioca Industry to Percentage Reduction of TSS (Total Suspended Solids). *IOP Conference Series: Materials Science and Engineering*, *309*, 012086. DOI: 10.1088/1757-899X/309/1/012086.

Pandiangan, Saut Maruli Tua. (2015). *Analisis Lama Mencari Kerja Bagi Tenaga Kerja Terdidik di Kota Medan*. Skripsi. Medan: Fakultas Ekonomi dan Bisnis, Program Studi Ekonomi Pembangunan, Universitas Sumatera Utara. https://www.academia.edu/52494724/Analisis_Lama_Mencari_Kerja_Bagi_Tenaga_Kerja_Terdidik_di_Kota_Medan.

Pandiangan, Saut Maruli Tua. (2018). *Analisis Faktor-faktor yang Mempengaruhi Penawaran Tenaga Kerja Lanjut Usia di Kota Medan*. Tesis. Medan: Fakultas Ekonomi dan Bisnis, Program Studi Ilmu Ekonomi, Universitas Sumatera Utara. http://repositori.usu.ac.id/bitstream/handle/123456789/10033/167018013.pdf?sequence=1&isAllowed=y.

Pandiangan, Saut Maruli Tua, Rujiman, Rahmanta, Tanjung, Indra I., Darus, Muhammad Dhio, & Ismawan, Agus. (2018). An Analysis on the Factors which Influence Offering the Elderly as Workers in Medan. IOSR *Journal of Humanities and Social Science (IOSR-JHSS)*, *23*(10), 76-79. DOI: 10.9790/0837-2310087679. http://www.iosrjournals.org/iosr-jhss/papers/Vol.%2023%20Issue10/Version-8/K2310087679.pdf.

Pandiangan, Saut Maruli Tua, Resmawa, Ira Ningrum, Simanjuntak, Owen De Pinto, Sitompul, Pretty Naomi, & Jefri, Riny. (2021). Effect of E-Satisfaction on Repurchase Intention in Shopee User Students. *Budapest International Research and Critics Institute-Journal*, *4*(4), 7785-7791. DOI: https://doi.org/10.33258/birci.v4i4.2697.

Pandiangan, Saut Maruli Tua, Oktafiani, Fida, Panjaitan, Santi Rohdearni, Shifa, Mutiara, & Jefri, Riny. (2022). Analysis of Public Ownership and Management Ownership on the Implementation of the Triple Bottom Line in the Plantation Sector Listed on the

Indonesia Stock Exchange. *Budapest International Research and Critics Institute-Journal, 5*(1), 3489-3497. DOI: https://doi.org/10.33258/birci.v5i1.4016.

Pandiangan, Saut Maruli Tua. (2022). Effect of Packaging Design on Repurchase Intention to the Politeknik IT&B Medan Using E-Commerce Applications. *Journal of Production, Operations Management and Economics (JPOME), 2*(1), 15–21. http://journal.hmjournals.com/index.php/JPOME/article/view/442.

World Health Organization. (2020). *WHO Director-General's Opening Remarks at the Media Briefing on COVID-19*. Accessed on 11 Maret 2020, from https://www.who.int/dg/speeches/detail/who-director-generals-opening-remarks-at-the-media-briefing-on-covid-19---20-november-2020.

Zhang, M., Zhou, M., Tang, F., Wang, Y., Nie, H., Zhang, L., & You, G. (2020). Knowledge, Attitude, and Practice Regarding COVID-19 Among Healthcare Workers in Henan, China. *Journal of Hospital Infection*, *105*(2), 183-187.