

Using Correlation to Explore the Impact of Corona Virus Disease on Socioeconomics

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Abstract

In the 21st century, the tragedy of the pandemic shocks the world. This non-natural disaster is called COVID-19. Its dominant effect is also worrying about social and economic conflicts at local, national, and even international levels. The orientation of this research is to investigate the impact of COVID-19 on the socioeconomic aspects in Indonesia from 2020-2022. We set the research using official/secondary publications. Data analysis was interpreted in three formats: Pearson, Kendall's, and Spearman's correlations. It channelled empirical testing through Microsoft Excel and SPSS v.25. Social items include migration, mortality, domestic violence, and sexual harassment, while the nine economic items are per capita spending, well-being, unemployment, poverty, and labor productivity. Then, statistical instruments were reviewed based on the correlation coefficient and level of significance (5% for Pearson and 1% for Kendall's and Spearman's). The results are not much different between Pearson's approach, Kendall's and Spearman's. In Pearson model, it proved a negative correlation when COVID-19 increases, so migration, unemployment, poverty, and labor productivity decrease. COVID-19 has had a positive impact on mortality, domestic violence, sexual harassment, per capita spending, and well-being. In Kendall's and Spearman's tests, poverty and labor productivity have actually increased because of COVID-19. Implementing semi-lockdown is a priority so that the social and macroeconomic constellations continue without ignoring the latent dangers of COVID-19. The limitations of the study are discussed in the future.

Keywords:

Correlation;
Socioeconomics;
COVID-19;
Time-Series;
Indonesia.

Article History:

Received:	18	February	2022
Revised:	21	April	2022
Accepted:	04	May	2022
Published:	07	June	2022

1- Introduction

The term pandemic has become often heard since the COVID-19 outbreak, which devastated the health, social, cultural, and economic sectors throughout the country [1]. Coronavirus Disease (SARS-CoV-2) or called COVID-19 first appeared since 2019. COVID-19 has become a global pandemic since established it by the World Health Organization (WHO) in March 2020. This pandemic first appeared in Wuhan, China at the end of 2019, then this virus is increasingly getting out of control and confirmed to spread to various parts of the world, including one of them is in Indonesia. Such an epidemic certainly changes the social and cultural values of the community, which impact changing the mindset, views, and especially people's attitudes in everyday life. Always use a mask, diligently washing hands with soap, being ready-to-use hand sanitizer, maintaining distance, avoiding crowds, avoiding physical contact with other people, and implementing various health protocols have become habits [2, 3].

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DOI: <http://dx.doi.org/10.28991/esj-2022-SPER-012>

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The pandemic doesn't seem to have stopped. At least, the long-lasting negative impact continues to whip. It should be noted that, during 2020, the accumulated positive cases of COVID-19 in Indonesia amounted to 743,198. Of these infections, 22,138 people were declared dead. Meanwhile, the status of people who were confirmed positive in 2021 jumped sharply to 4,262,720 people, of which 144,094 people were dead [4-6]. Various social activities that previously we could do freely now have to be carried out by implementing health protocols [7]. Even social activities such as weddings, parties, entertainment, and so on had to be stopped. There is a policy for the Implementation of Restrictions on Community Activities (PPKM) in Indonesia, which is sustainable until the last one [8]. The policy forces people to languish at home. Furthermore, efforts from the pandemic have also attacked various sectors, both in terms of humanity and education [9, 10]. Buying and selling activities in traditional markets were previously free to transact, but now many sellers have to go out of business. It also forced teaching and learning activities in schools and universities to be done virtually or online by utilizing existing technology [11]. This condition has only occurred because of a global pandemic that forces all parties to understand, understand, and implement existing protocols.

The emergence of new deadly variants, such as Alpha, Omicron, and Deltacron, is now increasingly worrying [12]. The terrible potential of the COVID-19 mutation, where people's activities will be more disrupted than the variance of its predecessor. These conditions make the psychological relationship of humans as social beings "defective". How come? Humans who are born naturally and live side by side, always need the help of others, now because of the pandemic forcing them to be selfish humans who only think about themselves and those closest to them in order to survive. Debate among scholars and researchers is ongoing in highlighting the deleterious effects of COVID-19. The contribution of the findings becomes a valuable lesson in decision-making. Social inequality and economic fear are under great pressure. COVID-19 has clouded and paralyzed almost all systems, pillars, performance, and sucked up aspects of life. The topic of social restrictions has circulated in various media and has become a hot issue to this day, related to the economic crisis that has a significant impact on society, such as dismissals, decreased purchasing power, and consumption to other problems that arise, including the frequency of social actions, cultural sentiments, or other massive linkages. From a humanitarian perspective, the indirect effect of the pandemic has made many parties aware that it is important to think rationally in difficult situations, unconsciously making movements or solidarity to help each other, highlighting a sense of brotherhood, strengthening unity, jointly thinking of solutions to combat the pandemic, and commitment to rise [13-17].

The essence of the research examines the risk of COVID-19, which impacts the socioeconomic side of Indonesia. We divide the structure of the paper into seven points, including an introduction, literature review and conceptual model, methods, findings, conclusions, practical implications, and theoretical contributions.

2- Literature Review and Conceptual Model

2-1- COVID-19 and Migration

The response to COVID-19 undermines migration in Tajikistan. The inflow of remittances has a disastrous effect on household welfare. Although the effect declined sharply, temporary expectations on migrant stocks were severe. Although the border closure policy is only temporary, they force those who work abroad in the spring to stay in their home countries. Ironically, immigrant workers still work in the destination country and cannot return. Incumbent migrants are looking forward to returning in the summer [18]. Balakrishnan 2021 [19] states that in Europe, the migrant population is getting out of control. Not only the risk of transmission, but crime and discrimination are always increasing. The social effects of prolonged lockdown as part of restrictions on mass movement have forced governments to close borders, leaving those who work desperately for asylum and desperate to be reunited with families in their home countries. Interestingly, Sanchez & Achilli (2020) [20] concludes the movement of government policies has restricted that migrant travel. Not only that, asylum seekers and refugees in various communities transit irregularly. As a result, facilitators emerged who smuggled migrants illegally, which resulted in clandestine travel activities. An important implication is the impeded dynamics of world mobility. Therefore, the first hypothesis is assumed:

Hypothesis 1: *As the COVID-19 trend increases, migration decreases.*

2-2- COVID-19 and Mortality

There is no denying that COVID-19 brings misery that is crucial to human survival. In 29 countries, Aburto et al. [21] found that life expectancy in 2020 is lower than in 2015 because the birth rate is very at risk of contracting the virus. The COVID-19 pandemic caused a case study in Oman, 15% of deaths. Health crises are driven by the coordination of health services and an accurate holistic approach [22]. On the one hand, the highest central source of COVID-19 transmission in Indonesia is Jakarta. The number of deaths recorded is the most dominant among other regions. The gender ratio between men is relatively higher than women [23]. They have shown predictions about the net impact of the pandemic in the USA to lower life expectancy. A total of 83% direct effects and 17% indirect effects eliminate the total historical years of life and death in 2020 [24]. For Spain, measuring deaths is monitored by a daily

surveillance system with mature estimates using time series analysis. During March 2020, excess deaths were much larger than in the previous calculation period. The basic estimate is that as you age, the potential for death is about 1.5 times higher than the confirmed COVID-19 wave. The demographic and geographical situation is very heterogeneous, triggering health risks, and the distribution of the spread is detected quickly [25]. The urgency for the second hypothesis is established as follows:

Hypothesis 2: *As the trend of COVID-19 increases, mortality will increase.*

2-3- COVID-19 and Domestic Violence

Bradbury-Jones & Isham [26] examine the consequences of COVID-19 on psychological changes in UK households. Economic vulnerability, job loss, and physical health are very at risk, especially in cases of violence. Not only two children and adults, but the focus acts of violence also occur in same-sex relationships. What is even sadder is the social impact that has implications for domestic violence. Effects of social isolation (distance) in functional structures, causing economic stress. In the USA, crisis situations report news about access services for potential victims of violence to media attention, health care, economic and social security, long-term prevention efforts, and sustainable response [27]. Then, Porter et al. [28] calculated the determination of physical violence against intimate partners and families during COVID-19 in Peru. As the lockdown period progressed, physical violence grew positively. Experimental results are based on gender, determining strategies for sensitive issues and survey reports. In the third hypothesis, it described:

Hypothesis 3: *As the COVID-19 trend increases, domestic violence will increase*

2-4- COVID-19 and Sexual Harassment

Jatmiko et al [29] confirmed that self-quarantine during COVID-19 gave rise to online sexual harassment activity. The sexual orientation toward social networkers has shifted from being physical, now turning to sexual harassment on social media. A series of dangerous behaviours are because by digital abuse because women who use social media a lot are vulnerable to gender-based virtual sexual harassment. Worse yet, in India, the quarantine situation gave negative results. Women's safety practices raise concerns. Cases of violence based on sexual harassment are often experienced by victims, especially women and children. Social and psychological spikes have been disruptive [30]. Stevens et al. [31] highlight that children in Kenya are at twice the risk as women during the pandemic. The pattern of sexual offences against younger children is actually experienced in private residences. Situational crimes against sexual vulnerability are getting out of control. Kane et al. [32] emphasize that sexual assault is increasingly rampant in Ireland. Although there are strict restrictions by the government, complex prevention cannot only focus on assumptions and myths. It is logical to plan the following hypothesis:

Hypothesis 4: *As the COVID-19 trend increases, sexual harassment will increase.*

2-5- COVID-19 and per Capita Spending

In 86 countries, improving health care capacity reduced 42% of deaths because civil society was more dominant in spending a lot of money on health aspects during the COVID-19 tragedy. The control of COVID-19 infection is putting a hole in the flexibility of people in the UK. The budget allocation for health facilities services is getting depleted. The level of public health funding does not control for socio-economic factors. Local communities are able to control the spread of the pandemic independently. Although their per capita spending peaked for the supply of medicines, over time it has been a success. High-income elites can reduce the wave of COVID-19 more quickly [33, 34]. In the USA, there is a significant disparity between regions with high-income and low-income populations. Those who work a lot as labourers are quite vulnerable. The effect of the country's lockdown along the border, stimulus-wise, affects the spending of the population. Although health expenditures increased, especially after obtaining initial donations, they did not reduce food insecurity [35]. Other costs that must be incurred in health protection are still minimal. Spatial policies do not stimulate the welfare of the population during a crisis. It makes sense to construct the following fifth hypothesis:

Hypothesis 5: *As the COVID-19 trend increases, per capita spending will decrease.*

2-6- COVID-19 and Well-Being

Recently, the psychological well-being of students, health workers and groups most exposed to COVID-19 in Italy has led to depression, trauma symptoms and stress disorders. From a psychological perspective, it provides benefits in patient psychological care so that it can save time and money [36]. Paredes et al. [37] understand that the serious impact of COVID-19 is mental well-being. According to an online survey in Bogota (Colombia), the element of resilience moderates personality traits and future anxiety, enabling individuals to cope with traumatic events. Lower levels of resilience, lead to excessive anxiety. Choi et al. [38] showed that the well-being of Koreans changed drastically during the outbreak. During this phase, welfare declines substantially, especially for the younger

population. The welfare levels of those who are younger change more fantastically than men and older people. Specifically, for the more severely affected areas, daily well-being fell significantly [39]. Acharya et al. [34] linked groups of young adults between the post- and pre-COVID-19 periods. The study's outputs yielded vital findings between the proportion of participants with high levels of depression during the pandemic. Prior to the COVID-19 situation, mental well-being was in a stable condition. Physical activity is impaired by clinical depression. We propose the objectivity of the next hypothesis:

Hypothesis 6: *As the COVID-19 trend increases, well-being decreases.*

2-7- COVID-19 and Unemployment

Rajagukguk [40] argues that the critical condition in Indonesia is ongoing because many companies have stopped their operations and implemented mass layoffs. The workers lost their jobs, and they were asked to stay at home without being paid. The company does not make profits like normal conditions, so sales also decline which automatically eliminates the work of the workers unilaterally. This viewpoint is exactly what is happening with the labor market in Tennessee (USA). An economic recession represents a severe social disadvantage. The burden of economic vulnerability is disproportionate to employment in pandemic "red zones" [41]. Malik et al. [42] expanded another piece of literature on the impact of pandemic shocks on the labor market. The short-term causality shock understands that social costs need to be reduced. To maintain the economy and prevent unemployment, the Indonesian government ensures supply chains through alternative strategies and maximizes subsidy programs for workers in the food security and health industry. Ahmad et al. [43] predict that developing and developed countries in Europe will lose their economic and financial potential in the next few years. Development planning and policy models will no longer be exciting because the unemployment ratio is higher than the jobs. The focus of the seventh hypothesis is as follows:

Hypothesis 7: *As the COVID-19 trend increases, unemployment will increase.*

2-8- COVID-19 and Poverty

Faudiana [44], and Suryahadi et al. [45] examined the economic losses caused by the pandemic in Indonesia. Starting from freelancers, traders, employees, and entrepreneurs racking their brains to escape the bondage of poverty. Social help through the provision of subsidized funds by the government to assist SMEs is an appropriate instrument. Social-economic recovery within the macroeconomic framework is quite supportive, although long-term effects remain. Ram & Yadav [46] estimate that economic turmoil has doubled poverty in India over the past two years. Inequality originates in rural areas due to unequal economic patterns of much as 50% - 80%. In urban areas, it identified group disparities at around 40% - 70%. Declining household consumption also exacerbated the dimension of poverty in Mozambique because of macroeconomic effects. Job losses and reduced in the COVID-19 period have rocked wages [47]. In ten critical weeks in the USA, from spring to winter to be exact, [48] analyzes ethnicity across socio-economic groups. The number of cases of poverty in the USA is reported due to limited resources, such as in urban areas. Referring to the empirical review above, the eighth hypothesis is conceptualized:

Hypothesis 8: *As the COVID-19 trend increases, poverty will increase.*

2-9- COVID-19 and Labor Productivity

The UK government makes rules about the duration of the lockdown. After it was implemented, work productivity increased. Although social distancing prevents premature death, it does not prevent worker compliance [49]. The opposite is true for a group of the Caribbean, Latin America and OECD countries. Aggregate growth of labor productivity is transformed. In a long-term relationship, productivity shocks in the infrastructure sector suffer losses and are affected by COVID-19 [50]. Prasetyaningtyas et al. [51] tracked performance between work-life balance (WLB) and job satisfaction on productivity mediated by working from home (WFH). Overall, WFH contradicts the WLB concept but affects the level of productivity and job satisfaction for employees who work in the banking industry in the Greater Jakarta area, Indonesia. In contrast, Mustajab et al. [52] examines work cultures and organizations that change traditional work styles to virtual ones (such as WFH). Two opposing sides of making a positive and negative impact on work balance. The lives of people who work from home are changing, although not all work can be done from home. Distractions from multitasking hinder productivity if enforced constantly. In three countries with developed economies (USA, UK, and France), the level of industrial production continues to grow. In short-term effects, the industrial sector is experiencing losses. However, the policy of reallocation of working hours still shows positive performance. The portion of work experienced an actual change. Interestingly, the slowdown in the hospitality and cultural sectors has not been matched by digital intensity, particularly in the dynamics of the business and labor market depending on tourism activities [53]. Thus, the final hypothesis that applies to refer to previous empirical research is:

Hypothesis 9: *As the COVID-19 trend increases, labor productivity will decrease.*

2-10-Measurement of Model

This research concentrates on ten items that calculate the relationship between COVID-19 and migration, mortality, domestic violence, sexual harassment, per capita spending, well-being, unemployment, poverty, and labor productivity. Nine hypotheses were developed, referring to the theoretical basis and empirical studies. Figure 1 is a circuit in the theoretical framework. These hypotheses are only projections, either positive (+) or negative (-) charges, so further testing is necessary.

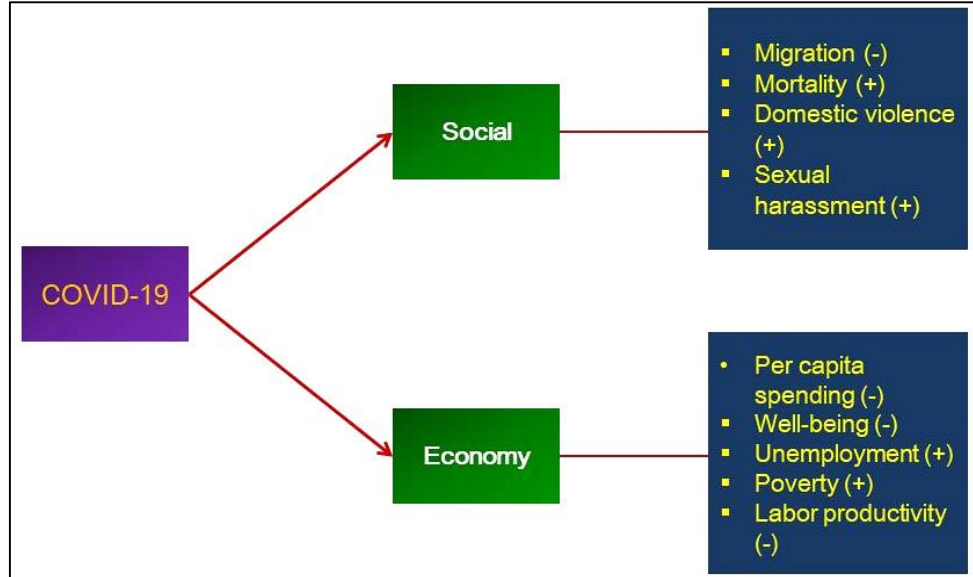


Figure 1. The theoretical framework (Adapted from [54-57])

3- Methods

3-1-The Data

The research data set was sourced from online publications. Each data has distinct characters and indicators. The sample of observations is 1,020 data ($N = 1,020$), in which 34 provinces throughout Indonesia were involved for three periods (year-on-year) and multiplied by 9 indicators. The years 2020-2021 are government report data, while specifically for 2022 are temporary calculation data. Table 1 displays the operationalization of the research variables.

Table 1. Indicators profiles

List of variables	Indicator used	Source
COVID-19 (C19)	A health crisis called acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or the spread of the 2019 novel coronavirus (2019-nCoV). The unit is the infection rate.	Singhal (2020) [58], Cascella et al. (2022) [59], Harapan et al. (2020) [60], Shereen et al. (2020) [61]
Migration (MG)	Tourist visits to Indonesia are based on flight, sea, and land routes. A unit is a person.	BPS Statistics – Indonesia (2022) [62]
Mortality (MT)	The cumulative number of people who were confirmed positive for COVID-19 and declared dead. A unit is a person.	Task Force for Handling COVID-19 – Republic of Indonesia (2022) [63]
Domestic violence (DV)	Any act against a person (especially children and women) that results in psychological, sexual and physical misery or suffering, or neglect of the household, including threats to commit acts, confiscation, and coercion. The unit is the case.	Ministry of Law and Human Rights – Republic of Indonesia (2022) [64]
Sexual harassment (SH)	Sexually nuanced actions, whether conveyed through physical or non-physical contact. The unit is the case.	The Databooks (2022) [65]
Per capita spending (PCS)	The average cost incurred by household members for consumption for one month is collected from production, purchase, and delivery based on food and non-food consumption. The unit is IDR.	BPS Statistics – Indonesia (2022) [62]
Well-being (WB)	Explicitly, well-being is measured by the Human Development Index (HDI). It explains how the population can access development outcomes by obtaining education, health, and income eligibility. The unit is an index.	BPS Statistics – Indonesia (2022) [62]
Unemployment (U)	Total unemployment to the total labor force, where workers are not full, are those who work under normal working hours (> 35 hours/week). The unit is %.	BPS Statistics – Indonesia (2022) [63]
Poverty (P)	Represents the minimum level of income deemed necessary to be met in order to improve an adequate standard of living in a country. The unit is IDR per capita/month.	BPS Statistics – Indonesia (2022) [62]
Labor productivity (LP)	The ratio between the overall size of their cohort and the labor force (national population in the same age range) in a sector. The unit is %.	BPS Statistics – Indonesia (2022) [62]

3-2- Model Assessment

We applied statistical evaluation using a parametric and non-parametric correlation approach [66, 67]. The two software include Microsoft Excel and SPSS for processing time-series data. The constructing process was reviewed by comparing the correlations, namely Pearson, Kendall's, and Spearman's [68]. The three correlation formulations are formulated:

$$r_{xy} = \frac{\sum xy}{\sqrt{(\sum x^2)(\sum y^2)}} \quad (1)$$

Where, r_{xy} : correlation coefficient between variable X and variable Y or two correlated variables ($x = X - M$) and ($y = Y - M$), $\sum xy$: multiplication between x and y, x^2 : the square of x (deviation x), and y^2 : square of y (y deviation).

$$\tau = \frac{2S}{n(n-1)} \quad (2)$$

Where, τ : Tau, S: the grand total which is a combination of the scores of the reasonable order of data pairs on a variable (if the ranking order is reasonable, then it is given a score of +1 and if the ranking order is not fair, it is given a score of -1), and n: the number of pairs of rankings.

The provisions in Spearman's test are formulated as follows:

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)} \quad (3)$$

Where, r_s : Spearman's correlation value 6: constant number, d^2 : difference of each rank pair, and n: a total of rank pairs for Spearman ($5 < n < 30$).

Figure 2 describes the model developed with standards and stages in the analysis. As previously explained, the scale or size of all variables is different. There are criteria to determine the degree of strength of the relationship between variables based on interpreting the correlation coefficient. The condition, refers to the absolute value of the correlation (r) as a simple rule, is $0 < |r| < 0.49$: weak relationship, $0.50 < |r| < 0.79$: moderate relationship, and $0.80 < |r| < 1$: strong relationship [69, 70]. Below is the standard for determining the alternative hypothesis and the null hypothesis. Interpreting decision-making is $p < 0.05$ (H_0 is rejected) and $p > 0.05$ (H_0 is accepted).

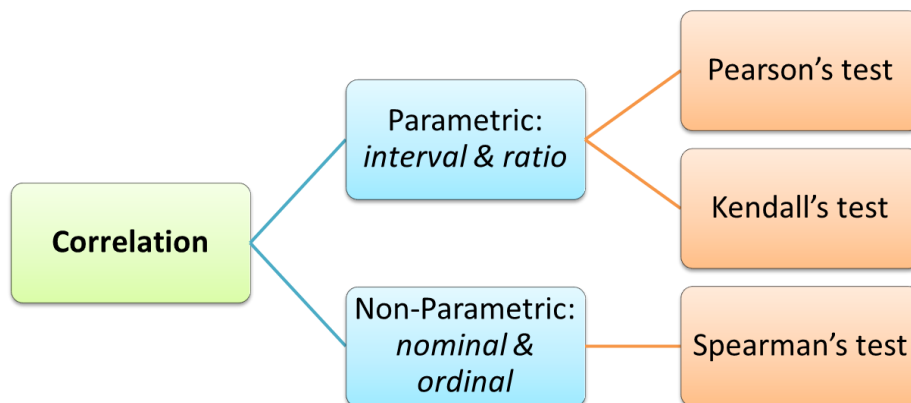


Figure 2. Analysis flowchart

H_a : there is a relationship between COVID-19 and the socio-economic aspect.

H_0 : there is no relationship between COVID-19 and the socio-economic aspect.

4- Finding

4-1- Results

The first focus is descriptive statistical output. Descriptive statistics is a method that deals with presenting, collecting data, and providing useful information. The information got from these descriptive statistics includes the tendency of a data set, the size of the data spread, and the concentration of data as numeric. Based on Table 2, it is known that $N = 1,020$ with various slopes in the range, mean, standard deviation, and variance. Determination of the social aspect is more dominant than the economic aspect, where the highest is "C19" ($R = 3,519,522$, $M = 2,320,317$, $SD = 1,787,968$, and $Var. = 3.19E+ 12$). Unfortunately, this achievement was not followed by "U" ($R = 0.38$, $M = 67.90$, $SD = 0.21$, and $Var. = 0.05$).

Table 2. Matrix of descriptive statistics

Items	Range	Mean	Std. Dev.	Variance
C19	3,519,522	2,320,317	1,787,968	3.19E+ 12
MG	2,495,393	2,752,924	1,250,980	1.57E+ 12
MT	443,060	210,476	228,867	5.29E+ 10
DV	220,861	417,384	111,102	1.23E+ 10
SH	4,163	8,954	2,081	4.332,644
PCS	57,009	1,485,203	28,563	81,588,8990
WB	50	7,222	25.66	658.34
U	1.59	7.21	0.80	0.64
P	165,881	539,855	88,954	7,912,825,759
LP	.38	67.90	0.21	0.05

Interpreting Pearson's correlation in the relationship between variables (see Table 3). From this, the correlation gain is very varied, the highest is 0.999, and the lowest is -0.773. It was explained that the increase in COVID-19 actually reduced migration ($C = -0.969$), unemployment ($C = -0.520$), poverty ($C = -0.024$), and labor productivity ($C = -0.107$). No exception for mortality ($C = 0.092$), domestic violence ($C = 0.440$), sexual harassment ($C = 0.340$), per capita spending ($C = 0.399$), and well-being ($C = 0.542$), where COVID-19 actually role in enhancing these five dimensions. The contribution of the two-way correlation between domestic violence and sexual harassment with per capita spending, led to a significant increase, where $p = 0.029$ and $p = 0.041$ with a very strong level or almost perfect because the correlation interval is $0.8 - 1$.

Table 3. Summary of Pearson correlations (*p <0.05)

Items	C19	MG	MT	DV	SH	PCS	WB	U	P	LP
C19	1	-0.969 (0.159)	0.092 (0.942)	0.440 (0.710)	0.340 (0.779)	0.399 (0.739)	0.542 (0.635)	-0.520 (0.652)	-0.024 (0.985)	-0.107 (0.932)
MG	-0.969 (0.159)	1	-0.336 (0.782)	-0.649 (0.550)	-0.562 (0.620)	-0.614 (0.580)	-0.733 (0.476)	0.292 (0.811)	-0.224 (0.856)	-0.143 (0.909)
MT	0.092 (0.942)	-0.336 (0.782)	1	0.935 (0.232)	0.968 (0.162)	0.950 (0.203)	0.887 (0.306)	0.803 (0.406)	0.993 (0.074)	0.980 (0.126)
DV	0.440 (0.710)	-0.649 (0.550)	0.935 (0.232)	1	0.994 (0.070)	0.999* (0.029)	0.993 (0.074)	0.538 (0.638)	0.887 (0.305)	0.846 (0.358)
SH	0.340 (0.779)	-0.562 (0.620)	0.968 (0.162)	0.994 (0.070)	1	0.998* (0.041)	0.975 (0.144)	0.627 (0.569)	0.932 (0.236)	0.899 (0.289)
PCS	0.399 (0.739)	0.614 (0.580)	0.950 (0.203)	0.999* (0.029)	0.998* (0.041)	1	0.987 (0.103)	0.576 (0.609)	0.907 (0.276)	0.869 (0.329)
WB	0.542 (0.635)	-0.733 (0.476)	0.887 (0.306)	0.993 (0.074)	0.975 (0.144)	0.987 (0.103)	1	0.436 (0.713)	0.827 (0.380)	0.778 (0.433)
U	-0.520 (0.652)	0.292 (0.811)	0.803 (0.406)	0.538 (0.638)	0.627 (0.569)	0.576 (0.609)	0.436 (0.713)	1	0.867 (0.333)	0.905 (0.280)
P	-0.024 (0.985)	-0.224 (0.856)	0.993 (0.074)	0.887 (0.305)	0.932 (0.236)	0.907 (0.276)	0.827 (0.380)	0.867 (0.333)	1	0.997 (0.053)
LP	-0.107 (0.932)	-0.143 (0.909)	0.980 (0.126)	0.846 (0.358)	0.899 (0.289)	0.869 (0.329)	0.778 (0.433)	0.905 (0.280)	0.997 (0.053)	1

Table 4 describes the two-way causality positively between COVID-19 and mortality, domestic violence, sexual harassment, per capita spending, well-being, poverty, and labor productivity ($C = 0.333$). The correlation path is weak because the coefficients are between 0.2 until <0.4. Only the relationship between COVID-19 and unemployment is negative ($C = -0.333$). The effect of all these relationships is not significant, where $p = 0.602$.

In other indicators, such as migration, it turns out that there is no relationship at all to COVID-19 ($C = -I$), even though the probability is 0.000. There are nineteen sections where the two-way causality is significantly perfect ($C = I$ and $p = 0.000$). The effect explains the positive coefficient of domestic violence on mortality, sexual harassment on mortality and domestic violence, then between per capita spending on migration, domestic violence, and sexual harassment, well-being on mortality and per capita spending. In addition, it is also followed by the relationship between poverty and mortality, domestic violence, sexual harassment, per capita spending, and well-being, as well as the causal effect between labor productivity on mortality, domestic violence, sexual harassment, per capita spending, well-being, and poverty.

Table 4. Summary of Kendall's Tau correlation (p <0.01)**

Items	C19	MG	MT	DV	SH	PCS	WB	U	P	LP
C19	1	-1 (0.000)	0.333 (0.602)	0.333 (0.602)	0.333 (0.602)	0.333 (0.602)	0.333 (0.602)	-0.333 (0.602)	0.333 (0.602)	0.333 (0.602)
MG	-1** (0.000)	1	-0.333 (0.602)	-0.333 (0.602)	-0.333 (0.602)	-0.333 (0.602)	-0.333 (0.602)	0.333 (0.602)	-0.333 (0.602)	-0.333 (0.602)
MT	0.333 (0.602)	-0.333 (0.602)	1	1 (0.000)	1 (0.000)	1 (0.000)	1 (0.000)	0.333 (0.602)	0.333 (0.602)	0.333 (0.602)
DV	0.333 (0.602)	-0.333 (0.602)	1** (0.000)	1	1 (0.000)	1 (0.000)	1 (0.000)	0.333 (0.602)	1 (0.000)	1 (0.000)
SH	0.333 (0.602)	-0.333 (0.602)	1** (0.000)	1** (0.000)	1	1 (0.000)	1 (0.000)	0.333 (0.602)	1 (0.000)	1 (0.000)
PCS	0.333 (0.602)	-0.333 (0.602)	1** (0.000)	1** (0.000)	1** (0.000)	1	1 (0.000)	0.333 (0.602)	1 (0.000)	1 (0.000)
WB	0.333 (0.602)	-0.333 (0.602)	1* (0.000)	1* (0.000)	1** (0.000)	1** (0.000)	1	0.333 (0.602)	1 (0.000)	1 (0.000)
U	-0.333 (0.602)	0.333 (0.602)	0.333 (0.602)	0.333 (0.602)	0.333 (0.602)	0.333 (0.602)	0.333 (0.602)	1	0.333 (0.602)	0.333 (0.602)
P	0.333 (0.602)	-0.333 (0.602)	1** (0.000)	1** (0.000)	1** (0.000)	1** (0.000)	1** (0.000)	0.333 (0.602)	1	1 (0.000)
LP	0.333 (0.602)	-0.333 (0.602)	1** (0.000)	1** (0.000)	1** (0.000)	1** (0.000)	1** (0.000)	0.333 (0.602)	1** (0.000)	1

With a threshold of 1%, Table 5 detects that the bidirectional relationship between COVID-19 and migration is negative, but that it is on a significant path ($C = -1$ and $p = 0.000$). This is in line with the negative COVID-19 coefficient on unemployment, but the effect is not significant ($C = -0.500$ and $p = 0.667$). The pandemic also stimulated an increase in mortality, domestic violence, sexual harassment, per capita spending, well-being, poverty, and labor productivity at a fairly strong or moderate coefficient level ($C = 0.500$). However, the two-way effect of the seven relationships was not significant ($p = 0.667$). The other phase also examined the increase in mortality that significantly affected domestic violence, sexual harassment, per capita spending, well-being, poverty, and labor productivity ($p = 0.000$), where the relationship was two-way and perfect ($C = 1$).

Table 5. Summary of Spearman's Rho correlation (p <0.01)**

Items	C19	MG	MT	DV	SH	PCS	WB	U	P	LP
C19	1	-1** (0.000)	0.500 (0.667)	0.500 (0.667)	0.500 (0.667)	0.500 (0.667)	0.500 (0.667)	-0.500 (0.667)	0.500 (0.667)	0.500 (0.667)
MG	-1** (0.000)	1	-0.500 (0.667)	-0.500 (0.667)	-0.500 (0.667)	-0.500 (0.667)	-0.500 (0.667)	0.500 (0.667)	-0.500 (0.667)	-0.500 (0.667)
MT	0.500 (0.667)	-0.500 (0.667)	1	1** (0.000)	1** (0.000)	1** (0.000)	1** (0.000)	0.500 (0.667)	1** (0.000)	1** (0.000)
DV	0.500 (0.667)	-0.500 (0.667)	1** (0.000)	1	1** (0.000)	1** (0.000)	1** (0.000)	0.500 (0.667)	1** (0.000)	1** (0.000)
SH	0.500 (0.667)	-0.500 (0.667)	1** (0.000)	1** (0.000)	1	1** (0.000)	1** (0.000)	0.500 (0.667)	1** (0.000)	1** (0.000)
PCS	0.500 (0.667)	-0.500 (0.667)	1** (0.000)	1** (0.000)	1** (0.000)	1	1** (0.000)	0.500 (0.667)	1** (0.000)	1** (0.000)
WB	0.500 (0.667)	-0.500 (0.667)	1** (0.000)	1** (0.000)	1** (0.000)	1** (0.000)	1	0.500 (0.667)	1** (0.000)	1** (0.000)
U	-0.500 (0.667)	0.500 (0.667)	0.500 (0.667)	0.500 (0.667)	0.500 (0.667)	0.500 (0.667)	0.500 (0.667)	1	0.500 (0.667)	0.500 (0.667)
P	0.500 (0.667)	-0.500 (0.667)	1** (0.000)	1** (0.000)	1** (0.000)	1** (0.000)	1** (0.000)	0.500 (0.667)	1	1** (0.000)
LP	0.500 (0.667)	-0.500 (0.667)	1** (0.000)	1** (0.000)	1** (0.000)	1** (0.000)	1** (0.000)	0.500 (0.667)	1** (0.000)	1

4-2-Discussion

The COVID-19 pandemic has brought major changes to all levels of society on various sides, including the socio-economic aspect [71]. The COVID-19 pandemic has forced restrictions on social activities between individuals, giving rise to different habits from their previous lives [72]. This pandemic has created a new community culture to respond to the actualization of the lockdown [73, 74].

The peak point of the spread of COVID-19 in Indonesia is in 2021. A total of 4,262,720 cases were confirmed positive in that period, or 473.56% from 2020, which detected only 743,198 cases of infection. Until 2022, it is projected to decrease by 54.14% or 1,955,033 cases because of repressive efforts by the government through the

vaccination program. Social and economic stability must be maintained in order to integrate policy transitions based on the development of daily contagion. It reflected the unexpected in Figure 3. The effect of COVID-19 on the socio-economic appears to be progressive. When there is a drastic spike from 2020 to 2021, migration and unemployment rates decline. However, the bad news for mortality, domestic violence, sexual harassment, spending per capita, well-being, poverty, and labor productivity is actually positive. Although 2022 represents a change in all aspects, it will only improve the migration, welfare and employment sectors. Meanwhile, individual and household conflicts are still disturbed.

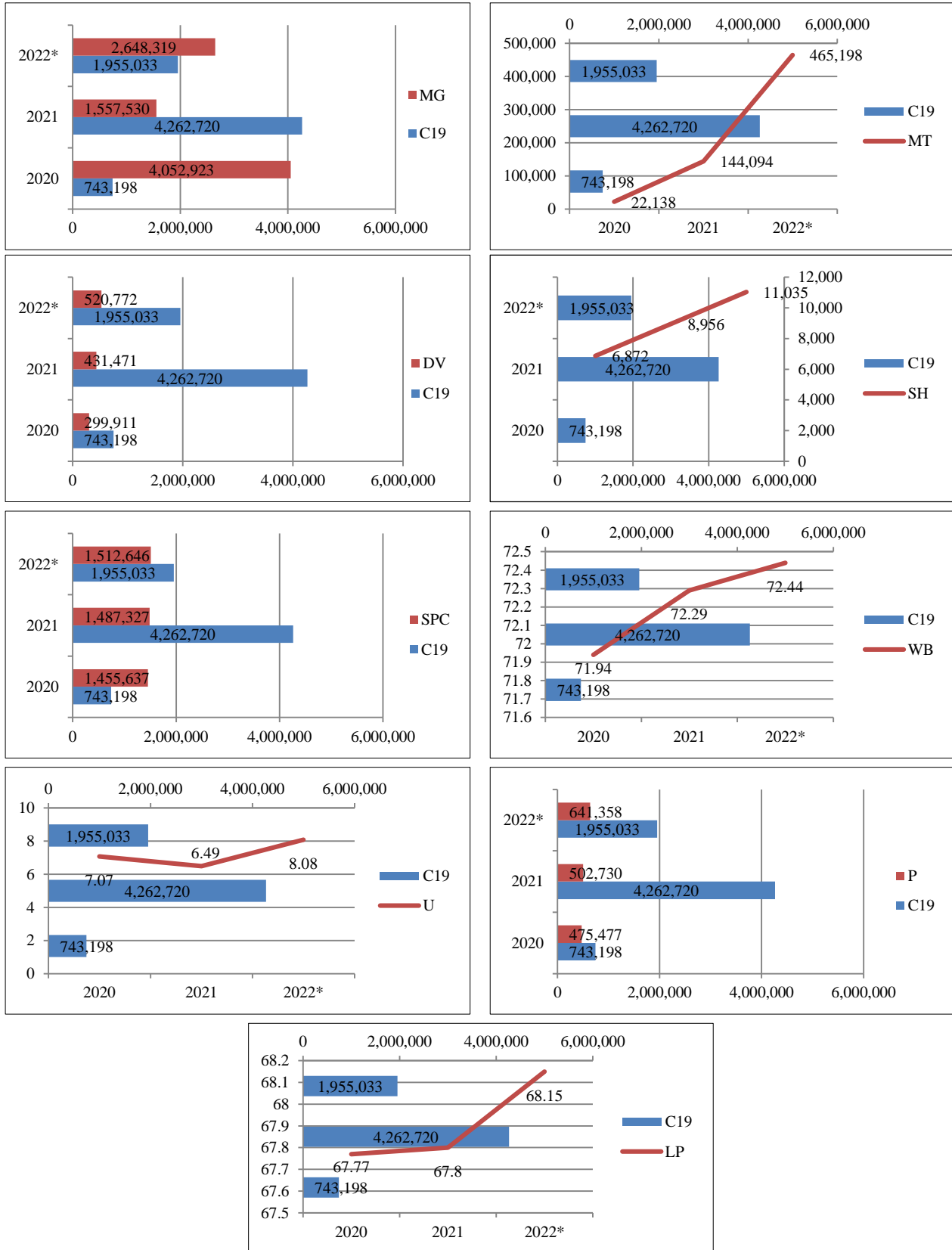


Figure 3. Interaction between variables (*predictions)

COVID-19 has disrupted migration rates from overseas [75]. For most of 2020, tourists cannot visit Indonesia [76, 77]. It was a strict response by the government to reduce the spread of the pandemic. Issuing the “PPKM” policy has forced migrant workers who work in companies of various scales and sectors not to enter or leave the region. With a mature decision, since 2021, the Indonesian government has loosened the rules through an open-close system with quarantine-based prevention. If those who want to visit Indonesia must carry out a quarantine at the center of the country (DKI Jakarta). On the other hand, domestic residents who plan to go abroad are welcomed by following the protocol imposed by the destination country. The procedure is, after returning and arriving in Indonesia, they are also required to quarantine in a spot the government has referred that has been referred to by the government to. The facilities for the COVID-19 prevention quarantine area are very complete. Besides medical treatment, each individual also receives “treatment, testing, and tracing” (3T) according to the schedule and queue number.

Various groups must obey all these rules. The reason is the explosion of the pandemic spike because people came to Indonesia by sea, land, or flight. Figure 4 illustrates a map of lock points in Indonesia. There are eight provinces that receive priority attention, including West Sumatra, Riau Islands, Jakarta, West Java, South Kalimantan, East Kalimantan, Bali, and West Papua. The locking gates to the island of Sumatra, such as those in West Sumatra and the Riau Islands, are the first entry points for migrants, which are known as the ASEAN route. Besides that, the Java Island locking gate really requires high coordination, because this route is the central focus, where the Jakarta and Bali areas are the areas with the highest levels of migration activity, among others. All people from various countries come to Indonesia through this region. Especially for Bali, which is famous for its exotic tourism, it has the potential to spread viral infections. Due to the population density in West Java and Jakarta, these two areas are the epicenter of the development of COVID-19, so it is also monitored comprehensively. The pandemic also threatened other areas, such as East Kalimantan and South Kalimantan, which are not as densely populated as Java Island. Many workers from abroad depend their lives here. They work a lot in plantation, oil, gas, and coal mining companies. In addition, many trade commodities between countries also pass by the sea in South Kalimantan and East Kalimantan. The factor that is the reason West Papua is in the lockdown's focus is because of the attractiveness of marine tourism and the many skilled or professional workers who work temporarily there, caused it. Although the population density level in West Papua is not as much as in other areas, the eastern locking gate is the focus of the government

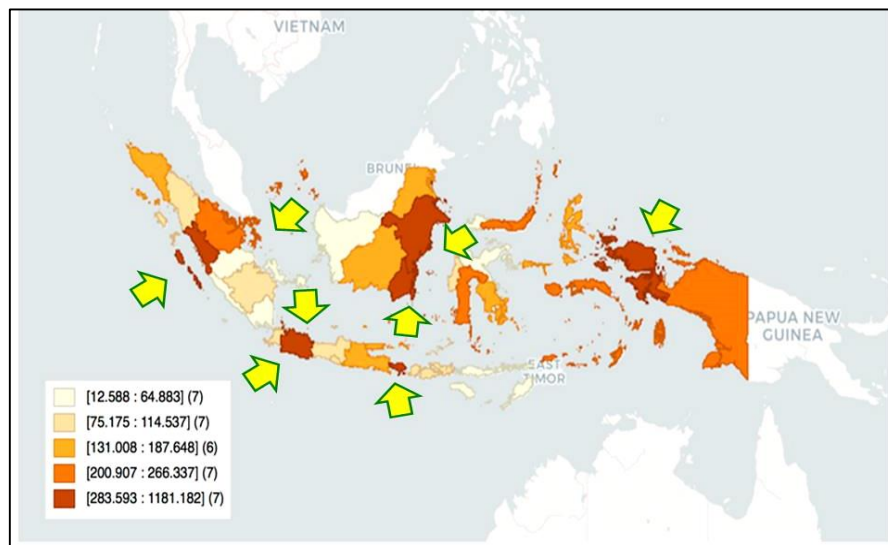


Figure 4. Lockdown focus in Indonesia (Adapted from Sevindik et al. (2021) [78])

It can suppress the death rate by how much effort the government has made to contain and respond to the pandemic. However, during one or two periods, it seemed futile, where COVID-19 actually increased mortality. Domestic violence is often experienced during the lockdown [79]. Many husbands who are dismissed unilaterally by the company are increasingly brutal. In fact, those who carry out WFH do not guarantee comfort in the household. The more frequent meeting with family members and rarely leaving the house for entertainment, the impact on individual mental health [80].

In Indonesia, the crime rate is rampant. Sexual harassment is clear on the rise. Apart from women and children, the victims also came from adult men [81]. The harassment ranges from sexual contact (physical) to virtual. Surprisingly, when the COVID-19 infection became unstoppable, per capita spending also increased. The development of the technological era is very rapid, so several tertiary sectors, including services, banking, and transportation, are easily accessible. People are switching from conventional transactions to online types of transactions. As a result, there was an increase in volume in the three sectors. Production, distribution and sales capacity become quick. Many job shifts,

which were originally involved in the formal field, are now in the non-formal sector. Macroeconomic reflection grows by taking advantage of market trends. Well-being, which comprises three components: education, purchasing power parity (PPP), and health. An alternative lifestyle, because of the pressure of the times, grew among the people. The background of knowledge also develops along with different literacy from before. "Generation Z" popularly called millennials, causes HDI levels to increase. The rapid adoption of technology, it is proven to modernize welfare to a significant level.

The opposite actually undermines social dynamics. The level of unemployment, poverty, and labor productivity. Not all people are the same as the millennial generation, who can adapt to the sophistication of science and technology. They do not maximize information capacity. Of those who still work conventionally, of course, their performance is not comparable to modern workers [82]. It does not integrate sectors complexly. Optimization of the economic aspect still takes a long time. Digital skills determine individual professionalism in organizations [83]. The circulation of money, including remittances, financial, and other monetary dimensions is also hampered.

5- Conclusion

The intensity of COVID-19 is a barrier to its tested socioeconomic in this study. Three structures of correlation analysis: Pearson, Kendall's, and Spearman's conclude two different findings. From the Pearson method, it is confirmed if the four hypotheses are rejected, while the five hypotheses are accepted. Uniquely, when the COVID-19 pandemic hit Indonesia, per capita spending increased. After that, unemployment and poverty levels actually decreased in the 2020-2022 period. Not much different, referring to two different approaches, which show that labor productivity and poverty increased by 33.3% (Kendall's) and 50% (Spearman's) after the pandemic. Meanwhile, in the Pearson correlation, it is exactly the opposite, where both aspects decrease by 2.4% (poverty) and 10.7% (labor productivity). Therefore, five hypotheses were accepted, and the rest were rejected.

To our knowledge, there have been many studies discussing the effects of COVID on socioeconomic, especially in Indonesia. However, nothing has combined the causality between COVID-19 and migration, mortality, domestic violence, sexual harassment, per capita spending, well-being, unemployment, poverty, and labor productivity. Therefore, this study is very selective in providing new knowledge to stakeholders. In addition, based on empirical testing, it also pioneered the importance of portraits of the socioeconomic dynamics of an unexpected disease outbreak. It carried health campaigns out in the context of disaster mitigation.

6- Practical Implications

Practical considerations for stakeholders, such as the government, are expected to intensively disseminate tips and educational information to internet users (especially social media activists) so that they are not only used for non-urgent interests, but for those who are students, workers, and business people. Because until now COVID-19 has not disappeared from life, the thing that can be implemented is as much as possible to live side by side with this virus without touching it and try to accept the situation by always implementing healthy protocols. That way, people's cultural life can return to the previous order, and it can even change into a better era. Concrete recommendations teach a lot. The community must address the positive disruption of social activities. However, the most important thing is to be grateful for what is happening by always maintaining health.

7- Theoretical Contribution

This finding becomes a theoretical contribution for stakeholders. Global pandemic phenomena, such as COVID-19, have caused socio-economics to be eroded increasingly [84]. People seem unconcerned and many of them lose emotional control [85, 86]. According to Crocker et al. [87], selfishness grows when individuals take the opportunity of existing conditions for the benefit of themselves or their group without thinking about the impact on others. Such as the case of social panic, when COVID-19 was present, where many individuals were hoarding masks and hand sanitizer. In the end, it is relevant to material and non-material losses for various groups. Not only shaking up social aspects, but the pandemic has also resulted in changes in habits in society. Since the daily high number of cases, it has caused many people to go "social media crazy". Almost every time, it always updates them on pandemic information. The impact of changes in community culture is increasingly visible, from the previously non-virtual shift to a virtual society, where social activities are carried out digitally.

8- Declarations

8-1-Author Contributions

J.J., Y.U. and Y.P.H.: conceptualization, F.F. and E.K.A.; methodology, D.C.C.; software, F.F., J.J., A.B. and Y.P.H.; validation, Y.U., E.K.A. and D.C.D.; formal analysis, F.F.; investigation, F.F. and J.J.; resources, A.B. and D.C.D.; data curation, J.J., Y.U. and E.K.A.; writing—original draft preparation, F.F., J.J., Y.P.H., Y.U. and E.K.A.;

writing—review and editing, A.B.; visualization, F.F., A.B. and Y.P.H.; supervision, J.J. and Y.U.; project administration, D.C.D.; funding acquisition. All authors have read and agreed to the published version of the manuscript.

8-2-Data Availability Statement

The data presented in this research are available on request from the corresponding author.

8-3-Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

8-4-Acknowledgements

All authors handle the division of tasks, writing, and data collection. We are very grateful to the Indonesian government for its access to data services.

8-5-Ethical Approval

Not applicable.

8-6-Conflicts of Interest

The authors declare that there is no conflict of interests regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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