

Measurement and Analysis of Differences in The Impact of The Implementation of Large-Scale Social Restrictions (PSBB) Based on The Mann Whitney Test.

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Abstract. This research is a non-parametric statistical measurement form which use the Mann Whitney Test. The aim is to determine whether or not there are differences in the impact of the implementation of the PSBB as a result of Covid-19 pandemic in the Surabaya, Gresik and Sidoarjo areas through the distribution of questionnaires and interviews, a sample of 134 people who were distributed in the 3 regions obtained. From the results of repeated simulations, measurements and testing to answer existing hypotheses, it can be seen that there are 3 things that are the conclusions of this study. The first conclusion, that there is no difference in the impact of the PSBB implementation in the Sidoarjo and Surabaya areas, which use $\alpha = 5\%$, the value obtained $Z_{count} = -0.65745$ is higher than $Z_{label} = +/- 1.96$. It is in the receiving area which means H_0 or the hypothesis that there is no difference in the impact of the PSBB implementation between Sidoarjo and Surabaya areas cannot be rejected. The second conclusion, that there are differences in the impact of the PSBB implementation in the Surabaya and Gresik areas with the result that the value of $Z_{count} = -2.28792$ is lower than Z_{table} . The same thing happened in the third test, there was a significant difference in the impact of the PSBB implementation in Sidoarjo and Gresik areas. Furthermore, in the descriptive analysis, there are several factors were found which effect the three tests result, as follows: geographic, demographic, social, cultural and employment factors.

Keywords: impact, large-scale social restrictions (PSBB), mann whitney test

1 Introduction

Development is a matter of concern for many individuals, groups, communities and nations in general (Catur Sugiyanto, 2019). If an economy wants to progress, the economy must invest (Rahardja and Manurung, 2008). At the end of 2019 and the beginning of 2020, Indonesia is optimistic about its economic development plans, poverty alleviation, employment, unemployment reduction, national output growth, investment realization, monetary stability, and all other macroeconomic indicators. The government also sets an economic growth rate of 5,3% in 2020. This is a realistic expectation given the previous achievements and Indonesia's macroeconomic conditions in 2019. The facts show different things. Before all those hopes and dreams came true, there was an epidemic. Coronavirus disease that was discovered in 2019, infectious disease caused by the corona virus. A new type of disease found in 2019. Globally, the corona virus disease pandemic has begun since the end of 2019 (Freddy Mutiara, Ambang Priyonggo, 2020). At first everyone thought that Covid-19 was common. Next, not slow but sure, but, fast and sure, Covid-19 not only crippled public health but also crippled the people's economy. Finally, almost the whole world calls it the Covid-19 pandemic. This in turn gave rise to an economic pandemic.

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Covid-19 has created an extraordinary negative multiplier effect for the Indonesian economy. An increase in the unemployment rate of 60,000 people in February 2020. Economic growth also declined in the first quarter of 2020; 2,97%. Exchange rate depreciation and rising inflation are macroeconomic indicators that worsened in February 2020 (BPS, 2020). Many countries have experienced recessions, many countries have revised their achievements, revised targets, and recalculated their financial capacity. Including Indonesia, in the middle of 2020 it must finally revise its economic growth target, from 0.4% to 2.3%. Whereas previously it was 5.3%. Like a match, there is a loss and there is also a win Maybe in 2020 we will lose. With confidence, enthusiasm, hard work, and some adjustment policies, the government is optimistic that in 2021 growth can return to 4.5% -5.5%. Our hopes and aspirations. All countries in the world are experiencing the Covid-19 pandemic. The Covid-19 pandemic has raised new problems for each region, including Indonesia. Several policy alternatives were made by the government as a solution to handling the Covid-19 pandemic. PSBB, this is the option chosen by the government in dealing with the Covid-19 pandemic. It was applied in almost all regions in Indonesia and had a tremendous impact on the people's economy. Not always at the same time, in each region can apply the PSBB to break the chain of spread of Covid-19 as needed and after obtaining approval from the central government. This situation also happened in East Java.

PSBB implementation in Greater Surabaya; Surabaya, Gresik, and Sidoarjo which always coincide in the coordination of the East Java Provincial Government. Taking into account the diversity of the population, population density, the amount of investment, geographical position, and the progress of regional development, these three cities can be considered as representations of cities in Indonesia in implementing the PSBB. This includes the consequences of implementing the PSBB. Observing this, the purpose of this study is to determine whether there are differences in the impact of the implementation of the PSBB in the three regions. Simulations, measurements, and analyzes were performed using the Mann Whitney Test. With several research samples in the three regions, comparisons were made to determine; a). whether there is a difference in the impact of the implementation of the PSBB between Sidoarjo and Surabaya, b). whether there is a difference in the impact of the implementation of the PSBB between Surabaya and Gresik, c). whether or not there is a difference in the impact of the implementation of the PSBB between Gresik and Sidoarjo. The existence of Covid-19 has created an extraordinary negative multiplier effect for the Indonesian economy (Bambang Budiarto, 2020b).

In general, impacts are the results felt by the community due to a change in an event or a change in circumstances. Meanwhile, what is meant by impact in this research is the economic condition felt by the people in Sidoarjo, Surabaya and Gresik due to the implementation of the PSBB. This is called an economic impact. The distribution of the questionnaire has 5 options for the impact felt by respondents on the implementation of PSBB; a). very affected, b). Impacted, c). quite affected, d). not affected, and e). very unaffected. The statistics are divided in two; descriptive statistics and inferential statistics. Descriptive statistics are related to recording data, recapitulating data, and presenting data for the purpose of describing important things in a group of data. Inferent statistics are related to decision making from grouping data in these descriptive statistics.

Furthermore, in some cases, problems that cannot be solved with parametric statistics, such as the cases raised in this study, will be resolved with non-parametric statistics. In this study, the problem solving was solved based on non-parametric statistics, the mann whiney test. As has been done previously, the impact is divided into 5, but the analysis of the measurement results will only arrive at whether or not there is a difference in the impact of the

PSBB application. Further research can be done if you want to get more analysis results. Based on this research, it can be continued by taking measurements on the basis of different measurement tools according to the desired objectives. Furthermore, in order to obtain good measurement results and analysis results, of course several concepts are needed to support this.

Globalization has also brought cultural integration into a complex business environment by contributing to the development of a globally oriented consumer culture (Cleveland, Rojas, Laroche, Papadopoulus, 2016). In the current global era, the world is developing dynamically and will continue to change without anyone being able to regulate the pace (Octavia, Indra, Hery, Firman, 2019). Related economic growth, then, there are terms which are almost the same and which are often used together, economic development and economic growth. In simple terms, development is often understood as from nothing to being, which means creating or making something. If economic development, of course, means making something in the economic field. Furthermore, for growth, it simply means that there is a process of increasing capacity from one period to the next, with the same unit, namely percent. Growth measurements can be made with formulations,

$$\frac{X_t - X_{t-1}}{X_{t-1}} * 100\% = Y\% \quad (1)$$

Economic growth, of course, is a process of increasing output capacity from one period to the next in percentage units. Output is the acquisition of the results of economic development, which means that it can be taken from income figures. It could be GDP, it could be GNP, or something else. Along with the development of measurement methods, there are now very various patterns of measuring economic growth. And what is certain is that at a theoretical level the value of this growth becomes very important along with the process of implementing economic development and the constraints it faces, because the value of this growth will later become one of the anatomical components of a region, whether it be a state or a region. An overview of Indonesia's economic growth can be seen in Table 1 and Table 2.

Table 1: Indonesia's Economic Growth in The Last Five Years

No	Year	Economic Growth (%)
1	2015	4,79
2	2016	5,02
3	2017	5,07
4	2018	5,17
5	2019	5,02

Source: BPS, several years of publication

Table 2: Economic Growth in The Last 6 Quarters

No	Year	Quarter	Economic Growth (%)
1	2019	I	5,07
2		II	5,05
3		III	5,02
4		IV	4,97
5	2020	I	2,97
6		II	-5,32

Source: BPS, several years of publication

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PSBB is a policy implemented by the government in an area in handling a problem. There is a legal basis that governs PSBB. There is Law which regulates Health Quarantine (UU No. 6/2018). In East Java, the provincial government issued which Large-Scale Social Restriction (Pergub Jatim No. 18/2020), as well as Government Regulation which concerning Large-Scale Social Restrictions in the context of Accelerating Handling of Corona Virus Disease 2019 (PP No. 21/2020). In addition there is also the Minister of Health which regulates the guidelines for implementing PSBB (Permenkes No. 9/2020). According to the Permenkes, it is explained that the PSBB is implemented during the longest incubation period of Covid-19, which is 14 days and can be extended if there is evidence of spread. Furthermore, for the city and district area, the Sidoarjo Regency Government has issued Regent Regulation (Perbup No. 31/2020). According to the regent's regulation, the PSBB was implemented for the first time in Sidoarjo on Tuesday, April 28, 2020. The community called it PSBB Volume I which was enforced for 14 days. Then continued Volume II for the next 14 days. In simple terms, it can be understood that the PSBB is carried out by local governments at both the provincial and district / city levels after obtaining approval from the Minister of Health through a Ministerial Decree that follows (Bambang Budiarto, 2020a). The implementation of the PSBB in East Java Province is coordinated by the East Java Provincial Government, therefore the PSBB adoption in Sidoarjo was finally carried out simultaneously with Surabaya and Gresik. Be with the name PSBB Surabaya Raya. Of course, quite a lot of changes and quite a lot of adjustments have been made along with the implementation of this PSBB. There are areas that are affected and there are areas that are not really affected. There are community groups that are affected and there are also groups in society that are not really affected. The impact is because everything is under restrictions. Driving is limited by the number of passengers, opening food stalls has limited operating hours, entertainment places have limited operating hours, etc. Everything is completely limited which ultimately hampers economic movement. At the macroeconomic level, the cessation of economic movements will of course impede public cash flow.

2 Method

Paying attention to several performance measurement tools, now there are several performance measurement tools (Bambang Budiarto, Firman Rosjadi, 2019). And, The Mann Whitney Test is one of them. This research with the aim of knowing whether or not there is a difference in the impact of the implementation of the PSBB in Sidoarjo Surabaya and Gresik uses data obtained through distributing questionnaires in the three regions. Of the 75 questionnaires distributed per region, 40 were returned to Sidoarjo. 59 returned questionnaires in Surabaya, and 35 returned questionnaires in Gresik. The recapitulation of data acquisition is shown in Table 3. Taking into account the research objectives with the acquisition of these data, a two-sample free test will be carried out using non-parametric statistics. It is said to be free because the existence of each sample is independent of one another. The test for the difference between two samples can actually be done with the t test in the parametric statistical method. This can be done provided that the data type is interval or ratio and follows a normal distribution or at least is considered normal. If one of these conditions is not fulfilled, for example data is of nominal or ordinal type, or for example data is of type interval or ratio but is not normally distributed, then the t test must be replaced with non-parametric statistics which are intended for two independent samples. And this is the case that is faced in this study, in the end we have to use non-parametric statistics, with the option of the Mann Whitney test.

Table 3: Recapitulation of Distributing Questionnaires on the Impact of PSBB Implementation in Sidoarjo, Surabaya, and Gresik

No	The Types of Impact	Sidoarjo	Surabaya	Gresik
1	very unaffected	9	2	4
2	not affected	8	10	8
3	quite affected	10	5	9
4	affected	23	17	11
5	very affected	9	6	3
	amount	59	40	35

Source: recapitulation of questionnaires

The first step is done by compiling a hypothesis, H_0 : the impact of implementing the PSBB is no different. H_1 : the impact of implementing the PSBB is different. Furthermore, the basis for decision making is to compare the Z_{count} value and Z_{tabel} value. If $Z_{count} < Z_{tabel}$ then H_0 is accepted. If $Z_{count} > Z_{tabel}$ then H_0 is rejected. In statistics, there are several patterns of decision making, this too can be done by looking at the probability values. If probability > 0.05 then H_0 is accepted. If the probability < 0.05 then H_0 is rejected. The steps that must be done, of course, are measuring the Z_{count} value and finding the Z_{table} value. This research will be conducted with a confidence level of 95% and the test will be two-sided.

3 Result and Discussion

Obtaining data from preliminary research can be done by empowering primary data obtained through questionnaires and interviews with random samples of business actors in economic activity units in several areas where the activities of economic activity units are carried out in Sidoarjo Regency, East Java Province. The method or approach was chosen because this method can be done in the process of collecting primary data, using questionnaires, interviews, and so on (Suryani & Hendriyadi, 2015). There are 3 cities; Sidoarjo, Surabaya, and Gresik, where the impact of PSBB implementation will be seen or not. Therefore a simulation will be carried out by measuring and testing 3 times: a). Simulation 1: to determine whether there is a difference in the impact of the implementation of the PSBB in Sidoarjo and Surabaya. b). Simulation 2: to determine whether there are differences in the impact of the implementation of the PSBB in Surabaya and Gresik. c). Simulation 3: to determine whether there is a difference in the impact of the implementation of the PSBB in Gresik and in Sidoarjo. All of these measurements can be done quickly with the help of various statistical software, including SPSS. With the consideration in order to obtain a better known result in the order of execution, in this paper it is shown that manual calculations must be carried out on the 134 collected questionnaires. In the initial stage, the 134 collected questionnaires were divided into 3 parts as shown in Table 4, Table 5, and Table 6. Before taking further measurements, what needs to be done first is to formulate a hypothesis, H_0 : there is no difference in the impact of the implementation of the PSBB in Sidoarjo and Surabaya. H_1 : There are differences in the impact of the implementation of the PSBB in Sidoarjo and Surabaya. Furthermore, the basis for decision making is to compare the Z_{count} value and the Z_{table} value. If $Z_{count} < Z_{table}$ then H_0 is accepted and if $Z_{count} > Z_{table}$ then H_0 is rejected (Damodar Gujarati, 2016). The first step is to determine the ranking value. Simulation Rank 1 value can be obtained by way of all respondents arranged from the choice of impact.

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From the smallest to the largest. From 1 to 5. After the respondents have grouped sequentially into the same impact choices, they are added up and then their average is calculated. In this case (Table 4), respondents 1 to 11 are respondents with the same impact, namely very unaffected, with a score of 1. So $(1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11) / 11 = 6$. This is the first ranking value. And so on until you find the next ranking values; 20.5; 37; 64.5; and 92. The next step is to classify the respondents by city, to then add up the ranking scores. Sidoarjo = 2899.5 and Surabaya = 2050.5. According to the basic concept of Mann Whitney, the next thing that must be calculated is the value of the U variable for the 2 cities, Sidoarjo and Surabaya. Measurement of Variable U can be done with the formulation $U = n1.n2 + [(1 / 2.n.x (n.x + 1) - Rx]$ (Singgih Santoso, 2004). With understanding; n1: the number of the first city variable, Sidoarjo = 59, and then n2: variable number of the second city, Surabaya = 40. Rx: total ranking in one city, Sidoarjo = 2,899.5 and Surabaya = 2,050.5.

There will be two values for the U variable, Sidoarjo and Surabaya. In the basic Mann Whitney concept, to measure the Z value, the small value of the U variable is used between the two values of the existing U variable.

Table 4: Recapitulation of Distributing Questionnaires on the Impact of PSBB Implementation in Sidoarjo and Surabaya

Respondents	City	impact	Ranking	Respondents	city	impact	Ranking
1	Surabaya	1	6	51	Surabaya	4	64,5
2	Surabaya	1	6	52	Surabaya	4	64,5
3	Sidoarjo	1	6	53	Surabaya	4	64,5
4	Sidoarjo	1	6	54	Surabaya	4	64,5
5	Sidoarjo	1	6	55	Surabaya	4	64,5
6	Sidoarjo	1	6	56	Surabaya	4	64,5
7	Sidoarjo	1	6	57	Surabaya	4	64,5
8	Sidoarjo	1	6	58	Surabaya	4	64,5
9	Sidoarjo	1	6	59	Surabaya	4	64,5
10	Sidoarjo	1	6	60	Surabaya	4	64,5
11	Sidoarjo	1	6	61	Surabaya	4	64,5
12	Surabaya	2	20,5	62	Sidoarjo	4	64,5
13	Surabaya	2	20,5	63	Sidoarjo	4	64,5
14	Surabaya	2	20,5	64	Sidoarjo	4	64,5
15	Surabaya	2	20,5	65	Sidoarjo	4	64,5
16	Surabaya	2	20,5	66	Sidoarjo	4	64,5
17	Surabaya	2	20,5	67	Sidoarjo	4	64,5
18	Surabaya	2	20,5	68	Sidoarjo	4	64,5
19	Surabaya	2	20,5	69	Sidoarjo	4	64,5
20	Surabaya	2	20,5	70	Sidoarjo	4	64,5
21	Surabaya	2	20,5	71	Sidoarjo	4	64,5
22	Sidoarjo	2	20,5	72	Sidoarjo	4	64,5
23	Sidoarjo	2	20,5	73	Sidoarjo	4	64,5
24	Sidoarjo	2	20,5	74	Sidoarjo	4	64,5
25	Sidoarjo	2	20,5	75	Sidoarjo	4	64,5
26	Sidoarjo	2	20,5	76	Sidoarjo	4	64,5
27	Sidoarjo	2	20,5	77	Sidoarjo	4	64,5
28	Sidoarjo	2	20,5	78	Sidoarjo	4	64,5
29	Sidoarjo	2	20,5	79	Sidoarjo	4	64,5
30	Surabaya	3	37	80	Sidoarjo	4	64,5
31	Surabaya	3	37	81	Sidoarjo	4	64,5
32	Surabaya	3	37	82	Sidoarjo	4	64,5
33	Surabaya	3	37	83	Sidoarjo	4	64,5

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34	Surabaya	3	37	84	Sidoarjo	4	64,5
35	Sidoarjo	3	37	85	Surabaya	5	92
36	Sidoarjo	3	37	86	Surabaya	5	92
37	Sidoarjo	3	37	87	Surabaya	5	92
38	Sidoarjo	3	37	88	Surabaya	5	92
39	Sidoarjo	3	37	89	Surabaya	5	92
40	Sidoarjo	3	37	90	Surabaya	5	92
41	Sidoarjo	3	37	91	Sidoarjo	5	92
42	Sidoarjo	3	37	92	Sidoarjo	5	92
43	Sidoarjo	3	37	93	Sidoarjo	5	92
44	Sidoarjo	3	37	94	Sidoarjo	5	92
45	Surabaya	4	64,5	95	Sidoarjo	5	92
46	Surabaya	4	64,5	96	Sidoarjo	5	92
47	Surabaya	4	64,5	97	Sidoarjo	5	92
48	Surabaya	4	64,5	98	Sidoarjo	5	92
49	Surabaya	4	64,5	99	Sidoarjo	5	92
50	Surabaya	4	64,5				

Source: recapitulation of questionnaires

Description: 1 = very unaffected
2 = not affected
3 = moderately affected
4 = affected
5 = severely affected.

U-Surabaya = 1.129.5 and U-Sidoarjo = 1.230.5. Furthermore, the smallest U value is included in the Z value measurement formulation.

$$Z = \frac{U - (1/2.n1.n2)}{\sqrt{1/12.n1.n2.(n1+n2+1)}} = \frac{1.129,5 - (1/2.40.59)}{\sqrt{1/40.40.59.(40+59+1)}} = -0,65745$$

(2)

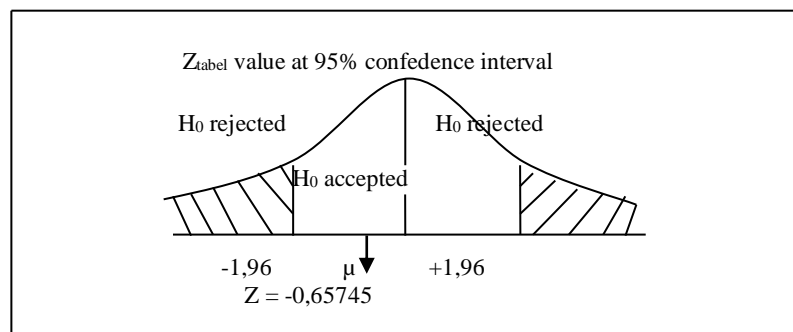
Table 5: Recapitulation of Questionnaires on the Impact of PSBB Implementation in Surabaya and Gresik

Respondents	City	Impact	Ranking	Respondents	City	Impact	Ranking
1	Surabaya	1	3,5	39	Surabaya	4	52,5
2	Surabaya	1	3,5	40	Surabaya	4	52,5
3	Gresik	1	3,5	41	Surabaya	4	52,5
4	Gresik	1	3,5	42	Surabaya	4	52,5
5	Gresik	1	3,5	43	Surabaya	4	52,5
6	Gresik	1	3,5	44	Surabaya	4	52,5
7	Surabaya	2	15,5	45	Surabaya	4	52,5
8	Surabaya	2	15,5	46	Surabaya	4	52,5
9	Surabaya	2	15,5	47	Surabaya	4	52,5
10	Surabaya	2	15,5	48	Surabaya	4	52,5
11	Surabaya	2	15,5	49	Surabaya	4	52,5
12	Surabaya	2	15,5	50	Surabaya	4	52,5
13	Surabaya	2	15,5	51	Surabaya	4	52,5
14	Surabaya	2	15,5	52	Surabaya	4	52,5
15	Surabaya	2	15,5	53	Surabaya	4	52,5
16	Surabaya	2	15,5	54	Surabaya	4	52,5
17	Gresik	2	15,5	55	Surabaya	4	52,5
18	Gresik	2	15,5	56	Gresik	4	52,5

19	Gresik	2	15,5	57	Gresik	4	52,5
20	Gresik	2	15,5	58	Gresik	4	52,5
21	Gresik	2	15,5	59	Gresik	4	52,5
22	Gresik	2	15,5	60	Gresik	4	52,5
23	Gresik	2	15,5	61	Gresik	4	52,5
24	Gresik	2	15,5	62	Gresik	4	52,5
25	Surabaya	3	31,5	63	Gresik	4	52,5
26	Surabaya	3	31,5	64	Gresik	4	52,5
27	Surabaya	3	31,5	65	Gresik	4	52,5
28	Surabaya	3	31,5	66	Gresik	4	52,5
29	Surabaya	3	31,5	67	Surabaya	5	71
30	Gresik	3	31,5	68	Surabaya	5	71
31	Gresik	3	31,5	69	Surabaya	5	71
32	Gresik	3	31,5	70	Surabaya	5	71
33	Gresik	3	31,5	71	Surabaya	5	71
34	Gresik	3	31,5	72	Surabaya	5	71
35	Gresik	3	31,5	73	Gresik	5	71
36	Gresik	3	31,5	74	Gresik	5	71
37	Gresik	3	31,5	75	Gresik	5	71
38	Gresik	3	31,5				

Source: recapitulation of questionnaires

With the value of $Z_{count} = -0.65745$, the next step is to find the value of the Z_{table} which is carried out at the 95% confidence level for the two-sided test where the value is ± 1.96 .



Sumber: adapted from nugroho (1996)

Figure 1: H₀ Rejected and Accepted Area – The First Simulation

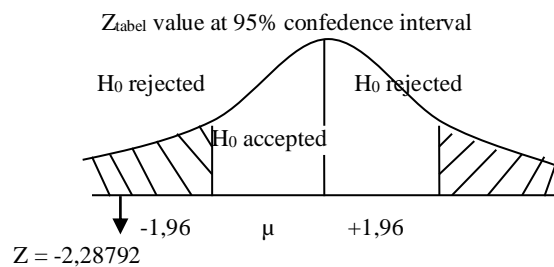
With the value of $Z_{count} = -0.65745$, between the Z_{table} value ± 1.96 , H_0 is accepted. This means that the hypothesis that there is no difference in the impact of the implementation of the PSBB in Sidoarjo and Surabaya is acceptable. This is the result of Simulation 1 for Sidoarjo and Surabaya, which turns out to have the conclusion that there is no difference in the impact of the implementation of the PSBB between Sidoarjo and Surabaya. Furthermore, in the same way measurements can be made for Simulation 2, Surabaya and Gresik. Simulation 2 is carried out based on the recapitulation of the results of the distribution of the questionnaire on the impact of the PSBB implementation as shown in Table 5.

Starting with the preparation of a hypothesis, H_0 : There is no difference in the impact of the implementation of the PSBB in Surabaya and Gresik. H_1 : There are differences in the impact of the implementation of the PSBB in Surabaya and Gresik. Furthermore, the basis for decision making is to compare the Z_{count} value and the Z_{table} value. If $Z_{count} < Z_{table}$ then H_0 is

accepted and if $Z_{count} > Z_{table}$ then H_0 is rejected. With the same steps as the measurement in Simulation 1, the value of $Z_{count} = -2.28792$ is obtained. This value is obtained in the way as below.

$$Z = \frac{U - (1/2.n1.n2)}{\sqrt{1/12.n1.n2.(n1+n2+1)}} = \frac{1.129,5 - (1/2.40.59)}{\sqrt{1/40.40.59.(40+59+1)}} = -2,28792$$

With the value of $Z_{count} = -0.65745$, the next step is to find the value of the Z_{table} which is carried out at the 95% confidence level for the two-sided test where the value is ± 1.96 .



Sumber: adapted from nugroho (1996)

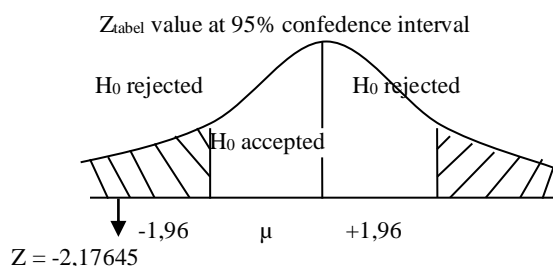
Figure 2: H_0 Rejected and Accepted Area – The Second Simulation

With the value of $Z_{count} = -2.28792 < Z_{tabel} -1.96$, H_0 is rejected. This means that the hypothesis that there is no difference in the impact of the implementation of the PSBB in Surabaya and Gresik cannot be accepted. This is the result of Simulation 2 for Surabaya and Gresik which turns out to have a conclusion that there are differences in the impact of the implementation of the PSBB between Surabaya and Gresik. Finally, in the same way, measurements can be made for Simulation 3, Gresik and Sidoarjo. Simulation 3 is carried out based on the recapitulation of the results of the distribution of the questionnaire on the impact of the PSBB implementation as shown in Table 6.

As in Simulation 1 and Simulation 2, it must be preceded by the preparation of a hypothesis such as the following, H_0 : There is no difference in the impact of the implementation of the PSBB in Gresik and Sidoarjo. H_1 : There are differences in the impact of the implementation of the PSBB in Gresik and Sidoarjo. Furthermore, the basis for decision making is to compare the Z_{count} value and the Z_{table} value. If $Z_{count} < Z_{table}$ then H_0 is accepted and if $Z_{count} > Z_{table}$ then H_0 is rejected. With the same steps as the measurements in Simulation 1 and Simulation 2, the value of $Z_{count} = -2.17645$ is obtained. This value is obtained in the way as below.

$$Z = \frac{U - (1/2.n1.n2)}{\sqrt{1/12.n1.n2.(n1+n2+1)}} = \frac{1.129,5 - (1/2.40.59)}{\sqrt{1/40.40.59.(40+59+1)}} = -2,17645$$

With a value of $Z_{count} = -2.17645$, the next step is to compare with Z_{tabel} at the 95% confidence level for the two-tailed test, ± 1.96 .



Sumber: adapted from nugroho (1996)

Figure 3: Ho Rejected and Accepted Area – The Third Simulation

Table 6: Recapitulation of Questionnaires on the Impact of PSBB Implementation in Gresik and Sidoarjo

Respondents	City	Impact	Ranking	Respondents	City	Impact	Ranking
1	Gresik	1	7	48	Sidoarjo	3	39
2	Gresik	1	7	49	Gresik	4	65,5
3	Gresik	1	7	50	Gresik	4	65,5
4	Gresik	1	7	51	Gresik	4	65,5
5	Sidoarjo	1	7	52	Gresik	4	65,5
6	Sidoarjo	1	7	53	Gresik	4	65,5
7	Sidoarjo	1	7	54	Gresik	4	65,5
8	Sidoarjo	1	7	55	Gresik	4	65,5
9	Sidoarjo	1	7	56	Gresik	4	65,5
10	Sidoarjo	1	7	57	Gresik	4	65,5
11	Sidoarjo	1	7	58	Gresik	4	65,5
12	Sidoarjo	1	7	59	Gresik	4	65,5
13	Sidoarjo	1	7	60	Sidoarjo	4	65,5
14	Gresik	2	21,5	61	Sidoarjo	4	65,5
15	Gresik	2	21,5	62	Sidoarjo	4	65,5
16	Gresik	2	21,5	63	Sidoarjo	4	65,5
17	Gresik	2	21,5	64	Sidoarjo	4	65,5
18	Gresik	2	21,5	65	Sidoarjo	4	65,5
19	Gresik	2	21,5	66	Sidoarjo	4	65,5
20	Gresik	2	21,5	67	Sidoarjo	4	65,5
21	Gresik	2	21,5	68	Sidoarjo	4	65,5
22	Sidoarjo	2	21,5	69	Sidoarjo	4	65,5
23	Sidoarjo	2	21,5	70	Sidoarjo	4	65,5
24	Sidoarjo	2	21,5	71	Sidoarjo	4	65,5
25	Sidoarjo	2	21,5	72	Sidoarjo	4	65,5
26	Sidoarjo	2	21,5	73	Sidoarjo	4	65,5
27	Sidoarjo	2	21,5	74	Sidoarjo	4	65,5
28	Sidoarjo	2	21,5	75	Sidoarjo	4	65,5
29	Sidoarjo	2	21,5	76	Sidoarjo	4	65,5
30	Gresik	3	39	77	Sidoarjo	4	65,5
31	Gresik	3	39	78	Sidoarjo	4	65,5
32	Gresik	3	39	79	Sidoarjo	4	65,5
33	Gresik	3	39	80	Sidoarjo	4	65,5
34	Gresik	3	39	81	Sidoarjo	4	65,5
35	Gresik	3	39	82	Sidoarjo	4	65,5
36	Gresik	3	39	83	Gresik	5	88,5
37	Gresik	3	39	84	Gresik	5	88,5

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38	Gresik	3	39	85	Gresik	5	88,5
39	Sidoarjo	3	39	86	Sidoarjo	5	88,5
40	Sidoarjo	3	39	87	Sidoarjo	5	88,5
41	Sidoarjo	3	39	88	Sidoarjo	5	88,5
42	Sidoarjo	3	39	89	Sidoarjo	5	88,5
43	Sidoarjo	3	39	90	Sidoarjo	5	88,5
44	Sidoarjo	3	39	91	Sidoarjo	5	88,5
45	Sidoarjo	3	39	92	Sidoarjo	5	88,5
46	Sidoarjo	3	39	93	Sidoarjo	5	88,5
47	Sidoarjo	3	39	94	Sidoarjo	5	88,5

Source: recapitulation of questionnaires

With the value of $Z_{count} = -2,17645 < Z_{tabel} -1,96$, H_0 is rejected. This means that the hypothesis that there is no difference in the impact of the implementation of the PSBB in Gresik and Sidoarjo cannot be accepted. Thus the results of the last simulation for Gresik and Sidoarjo turned out to have the conclusion that there was a difference in the impact of the implementation of PSBB between Gresik and Sidoarjo.

4 Conclusion

Observing several simulations carried out, several conclusions were obtained. First, there is no difference in the impact of the implementation of PSBB between Sidoarjo and Surabaya. At 95% confidence level, the value of $Z_{count} = -0.65745$ which turned out to be greater than $Z_{tabel} = -1.96$. There is in the receiving area which means H_0 or the hypothesis which states that there is no difference in the impact of implementing PSBB between Sidoarjo and Surabaya cannot be rejected. Second, with the value of $Z_{count} = -2.28792$ which turns out to be smaller than $Z_{tabel} = -1.96$ which means that there is a different impact on the application of PSBB in Surabaya and Gresik. The same thing happened in the third test for Sidoarjo and Gresik areas. With the value of $Z_{count} = -2.17645$, it means that it is smaller than $Z_{table} = -1.96$. This implies that there are different impacts on the application of PSBB in Sidoarjo and in Gresik. Furthermore, in the descriptive analysis, several factors were found that caused the three conclusions to occur; namely geographical, demographic, social, cultural and employment factors.

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