



THE IMPACT OF POLICIES DURING COVID-19 BY FACTORS AFFECTING THE HUMAN DEVELOPMENT INDEX IN SOLORAYA USING REGRESSION METHOD

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Abstract

Acommotion, COVID-19 is a significant phenomenon that occurs not only in Soloraya but also around the world. It is undeniable that the emergence of this phenomenon affects many sectors, one of which is regional development. Regional development itself can be measured by how good the human resources are. So this study wants to see if any changes have occurred during COVID-19. From the social and population sectors. The analysis used was regression with a significance level (α) of 5%. As a result, unemployment, poverty, and crime have a significant impact on HDI in the Soloraya region. Bps Central Java data in 2021 shows that the HDI of Surakarta City from 2016 to 2020 has experienced an increase in development, from 80.76 to 82.21. This condition is relevant to the development of the figures achieved in Central Java Province, both of which have increased. At the policy level, regional leaders focus on controlling the spread of COVID-19 as stated in the Circular Letter of the Mayor of Surakarta Number 067/036 concerning the Implementation of Restrictions on Community Activities to Control the Spread of CoronaVirus Disease 2019 (Covid-19) in Surakarta City, thus affecting efforts to suppress the hampered HDI numbers.

Keywords: Index Provisions, COVID-19, HDI, Regression, Policy

INTRODUCTION

The impact of COVID-19 is the emergence of various social problems in society. In addition, it can cause the economic development of an area to be hampered, as indicated by the value of the Human Development Index (HDI). The Human Development Index is formed from 3 main dimensions: longevity and health, Knowledge, and a decent Standard of Living. Meanwhile, due to COVID-19, social problems have arisen in poverty, unemployment, and crime. These three social problems can affect the basic dimension of HDI, which is a decent standard of living. The emergence of COVID-19 affects the movement of the HDI rate in Indonesia, which means it also affects the HDI rate in regencies/cities, especially the Solo Raya area.

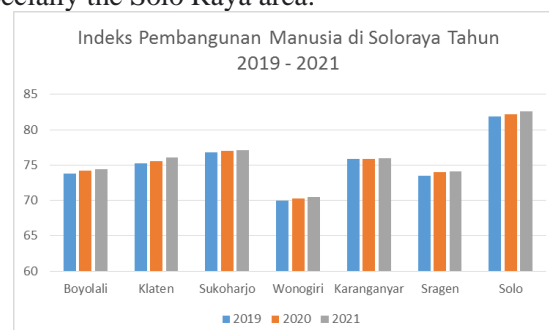


Fig. 1 Human Development Index of Soloraya

COVID-19, in addition to impacting HDI, also affects social problems that arise in society, including poverty, unemployment, and crime. These three social problems describe the feasibility of living conditions in society. This change could be one of the alleged effects on HDI.

This study will take samples of the Soloraya area consisting of Solo City, Karanganyar Regency, Sragen Regency, Sukoharjo Regency, Wonogiri Regency, Klaten Regency, and Boyolali Regency. The graph below illustrates the rates of poverty, unemployment and crime in the Soloraya region. An interesting picture of the social problems in Soloraya is that the city of Solo has a low poverty rate, but the percentage of unemployment is high compared to the other 6 districts.

Based on [11], it can be seen that the HDI achievement of Surakarta City in 2020 is the highest, with a value of 82.21. Meanwhile, Sukoharjo Regency occupies the second position with a score of 76.98, and Karanganyar Regency is in third place with an achievement of 75.86. In detail, it can be seen in the Fig 2.

Based on [19] Number 6 of 2021 concerning the Regional Medium-Term Development Plan for 2021-2026, it can be explained in full about the indicators of the formation of the HDI of Surakarta City, which consists of Life Expectancy, School Year Expectations, Average Length of Schooling, and Expenditure. Per capita. The gap between the workforce (job seekers) and the available jobs is also the cause of the high unemployment rate in Surakarta. 3 things, namely causing an increase in the unemployment rate:

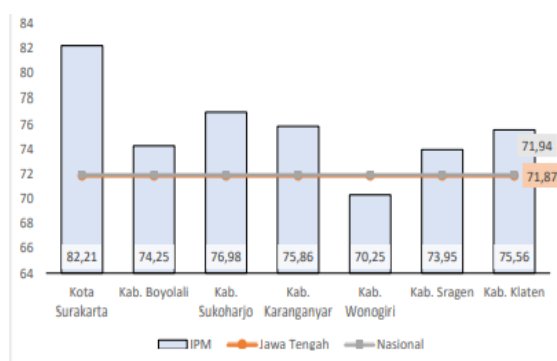


Fig. 2. The Position of Surakarta City HDI Achievement Compared to Others

1. Low interest in entrepreneurship in society (4.95% of new entrepreneurs);
2. The skilled workforce is still low (50%); and
3. Labor has not been in accordance with market needs, so the number of job seekers allocated is still less (74%).

These conditions make it important to know the factors that affect HDI to become the basis for future policy making as an effort to improve the recovery of the regency/city condition in Soloraya.

METHOD

This study used secondary data published by the Central Statistics Agency (BPS) of Central Java province, namely Central Java, in the figures of 2011 – 2021. The data used in this study are the percentage of poor people in the Solo Raya area, the percentage of open unemployment in Soloraya, the Crime/Crime index in Soloraya, and the Human Development Index in Solo Raya from 2011 – 2021. The analysis used is Regression Analysis using SPSS version 23 as an analysis tool.

Regression Analysis

The Analysis Indicator used in this study is Multiple Regression Analysis, which will form the following equation:

$$Y_i = \alpha + \beta x_1 + \beta x_2 + \beta x_3 + e$$

Details:

Y_i is the approximate value of the Human Development Index - i

α is interception (The condition of the value of the Human Development Index when the influencing factor is 0)

β is the value of a constant that indicates an increase every 1 value of an independent variable.

x_1 is the poverty variable.

x_2 is the unemployment variable.

x_3 is the variable for the number of crimes.

Test Assumptions

The Multiple Regression Model must meet the assumption of the BLUE (Best Linear Unbiased Estimator) criterion, known as the Gauss-Markov theorem. The estimator is the best, which means that it has a small variance compared to the parameters obtained through other linear methods and is not biased, which means that the estimator value is close to the population value.

According [17], some problems can cause an estimator to be unable to meet the assumptions of the BLUE criteria, namely:

1. Normality

In statistical methods can use the statistical test method of Kolmogorov Smirnov. The Kolmogorov Smirnov sample test is used to determine the distribution of data, whether it follows the normal, Poisson, uniform and exponential data distribution. In this case, to find out whether the residual distribution is usually distributed or another distribution. Residues are usually distributed if the significance value is greater than 0.05 [17].

2. Multicholnearity

Multicholnearity is a condition in which there is a perfect or close linear relationship between independent variables in a regression model. Regression models have multicholnearity if there is a perfect linear function on some or all independent variables in the linear function. Symptoms of multicholnearity include looking at the variance inflation factor (VIF) and tolerance values. If the VIF value < 10 and tolerance > 0.1 , it means that there is no multicholnearity [20].

3. Heteroskedasticity

The heteroskedasticity test is performed to test whether there is a fixed residual variance inequality from one observation to another, called Heteroscedasticity [18]. There are two ways to determine the presence or absence of symptoms of heteroskedasticity, by the graphic method and the statistical method.

4. Autocorrelation

Autocorrelation is the relationship between a residue or observation and another observation residue. Data containing autocorrelations, the estimators obtained are still linear, unbiased but do not have a minimum variance. One way to check if there is autocorrelation is to look at the value of Durbin Watson [22].

RESULTS AND DISCUSSION

Analysis Results

1) *Descriptive Analysis*

a) *Poor Population Variables in Soloraya*

From Fig 3, it can be concluded that the areas with high poverty rates are Klaten and Sragen Regencies. There has been a gradual increase in the poverty rate from 2019 to 2020, which is still increasing in 2022.

b) *Unemployment Variables*

From Fig 4, it can be said that Solo City experienced a significant spike in the unemployment rate in the 2019-2020 transition and has not been resolved in 2021. This transition is an incident of the emergence of COVID-19 in the Soloraya region. It can be said that all 7 regions in Soloraya are feeling the impact on the unemployment rate.

c) *Criminality or Crime Index Variables*

From Fig 5, it can be seen that during COVID-19, crime has continued to decline. It is suspected that this is because, during COVID-19, the government-imposed lockdowns and PPKM, which meant that public places were deserted every day and housing was permanently occupied. So that a person's desire to commit a crime is suppressed because of these factors, they are more likely to be arrested if they continue to commit the crime.

d) *Human Development Index Variables*

According to BPS, the Human Development Index (HDI) explains how the population can access development outcomes in obtaining income, health, education, and so on. In addition, HDI was introduced by the United Nations Development Programme (UNDP) in 1990 and is published regularly in the annual Human Development Report (HDR). From chart 1, it can be seen that the HDI is slowly decreasing. Meanwhile, the local government hopes that the HDI

figure will continue to rise. The lowest HDI figure occurred in Wonogiri Regency, and the highest HDI was in Solo.

2) *Regression Analysis*

Results Of the Analysis for regression obtained the results of Table I. From the t-test, the variables of poverty, unemployment, and crime have a significant effect on HDI. Judging from the sig value of each variable is less than 0.05 (α). Of the three variables, the poverty variable in Soloraya has a negative impact on HDI, which means that if the number of poor people in Soloraya increases, the HDI will decrease.

The equation of the obtained model:

$$IPM = 83.307 - 1.104x_1 + 0.429x_2 + 0.004x_3$$

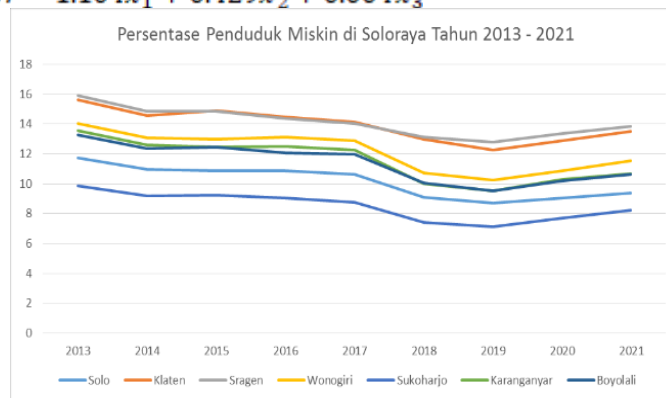


Fig. 3 Poverty Level in Soloraya 2013-2021

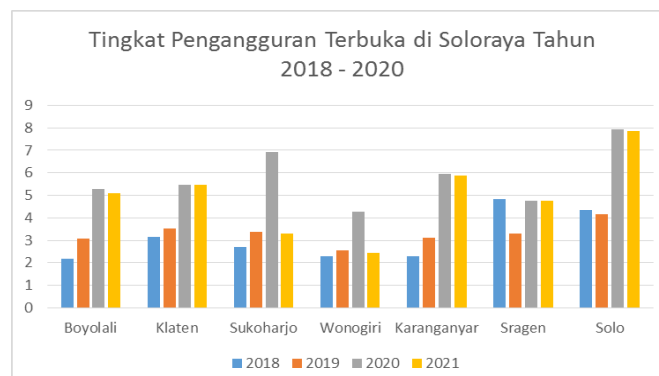


Fig. 4 Open Unemployment Rate in Soloraya 2018 – 2021

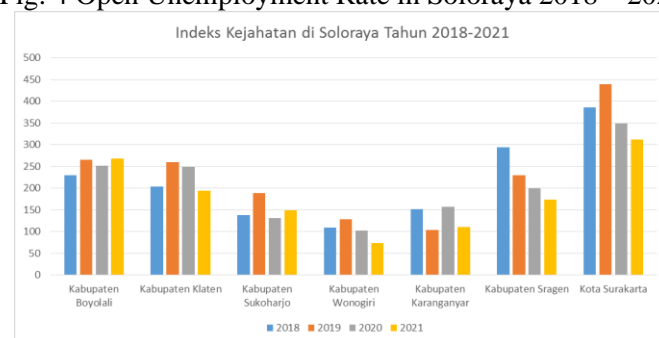


Fig. 5 Crime Index in Soloraya 2018-2021

Table 1 Estimation of HDI Regression in Soloraya

Pattern	B	Sig
constant	83.307	0.000
x1	-1.104	0.000
x2	0.428	0.041

x3	0.004	0.000
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Once we have obtained the equation from the HDI, we first examine the assumptions obtained from the output, which are summarized in Table II

All assumptions in the regression equation have been fully filled, including normality, heteroskedasticity, multicollinearity, and autocorrelation. So we can continue to look at the value of determination to see how well the equation is formed.

To determine if the model is good, we can look from the Determination number displayed in the Table III.

The fit goodness of the regression model can be seen from the determination value (R²) [21]. The value of the coefficient of determination ranges from 0 to 1, if the value is close to 1, it can be said that the influence of the independent variable on the dependent variable is large, meaning that the model obtained is good. to explain the existing variable and can be used for estimation [15]. Table II gets the value of R² is 0.592, which means that the above model can explain the HDI of 59.2%, and the rest is explained by other independent variables that were not used in the study.

Policies that have changed or that appeared before and after the onset of covid-19. JP Morgan assesses that the global economy will reach -1.1% in 2020. Eiu and Fitch assess that the global economy will be worth -2.2%, while the IMF itself assesses that the global economy will be worth -3% This figure is very bad value and is feared that it can cause chaos around the world [12]. The existence of COVID-19 has a negative effect on humans in getting income to live. Layoffs experienced by workers are estimated to amount to 1,943,916 people from around 114,340 companies with details of 77% sourced from the formal sector and 23% sourced from the informal sector [1]. It added, according to Asep, et al based-on calculations from economic growth that occurred during COVID-19, although that the average poverty in Indonesia could increase rapidly due to COVID-19. The average poverty rate increased by about 9.7% - 12.4% due to COVID-19 in 2020. Many of the 1.3-8.5 million experienced poverty due to this outbreak [2].

COVID-19 has also exacerbated unemployment in Indonesia, where unemployment in Indonesia during 2014-2019 has experienced a fairly good decline. However, since the Covid-19 outbreak hit, the number of unemployed people is estimated to increase by around 2.9-5.2 million people [17]. The government is trying to implement various policies that are expected to help people to avoid poverty and unemployment. One of them is an increase in the budget of 10 trillion in the Pre-Employment Card program so that it can reach 20 triliyun so that it can help 5.6 million unemployments. However, the specifics of this program are not specific in determining the targets to be achieved so that there is a wrong target that only becomes a boomerang for the government [14].

Table 2. Regression Model Assumptions

Assumption	Statistical Tests	Conclusion
Normality	Sig (Shapiro Wilk) > 0.05	Fully charged
Multicholnearity	VIF < 10	Fully charged
Heteroskedasticity	Glejser test = all significant	Fully charged
Autocorrelation	Durbin Watson = 1,870	Fully charged

Table 3. Model Summary

R	R ²	Adj.R ²
0.770	0.592	0.576

The Surakarta City Government every year tries to reduce the unemployment rate by making the Open Unemployment Rate (TPT) an indicator that describes the unemployment rate of the total population. TPT Indicators in Surakarta City Regional Regulation Number 9 of 2016 concerning the Surakarta City Medium-Term Regional Development Plan for 2016-2021. Meanwhile, in the latest RPJMD of Surakarta City, 2021-2026, it is explained that the large open unemployment rate shows

the large percentage of the workforce included in unemployment. The development of TPT in Surakarta City showed a decrease from 2017 to 2019, from 4.57% to 4.49%. However, in 2020 there was a significant increase to 7.92%. This is the impact of the Covid-19 pandemic which has caused many companies to lay off jobs (layoffs), reduce the number of employees, and even cut employee salaries. The emergence of this wave of layoffs adds to the number of unemployed. On the other hand, employment has decreased because many companies are trying to stay afloat with the number of existing employees. The graph below shows that the TPT of Surakarta City, Central Java Province, and the National TPT experienced a significant increase in 2020.

The COVID-19 pandemic has caused policy changes that focus on public health and efforts to control the spread of COVID-19 through Surakarta Mayor Regulation Number 12 of 2021 concerning the Second Amendment to Mayor Regulation Number 39 of 2020 concerning the Implementation of Discipline and Law Enforcement of Health Protocols as an Effort to Prevent and Control CoronaVirus Disease 2019 in Surakarta City, and Surakarta Mayor Circular Letter Number 067/057 concerning Amendments to the Letter Circular of the Mayor of Surakarta Number 067/036 Enforcement of Restrictions on Community Activities to Control the Spread of CoronaVirus Disease 2019 (Covid-19) in Surakarta City. In 2021, after covid-19 cases declined, the Surakarta City government tried to restore conditions by implementing various strategies. The post-COVID-19 economic recovery strategy carried out by the Surakarta City government in 2021 includes, first, reactivating industry, tourism, and investment by providing support to tourism and creative economy actors in terms of employment, utilities, levy relief, and loan relaxation. The next step is the normalization stage, namely re-promoting both at home and abroad, to prepare incentives for the tourism industry and creative economy players. Second, reactivate the economic engine needed to absorb workers who have lost their jobs and mobilize other businesses related to policies to make it easier for business actors to reopen jobs to improve the community's economy and reduce unemployment due to the impact of COVID-19.

A tangible manifestation of efforts to reduce unemployment is the collaboration between the Surakarta Vocational Training Center (BLK) and the Surakarta City Government through the Surakarta City Manpower and Industry Office by running the Skills Development Center (SDC) Program since 2021. The implementation of job training is expected to encourage the improvement of people's competence in work or entrepreneurship to overcome the problem of unemployment and economic recovery in the EU against COVID-19 in Surakarta City.

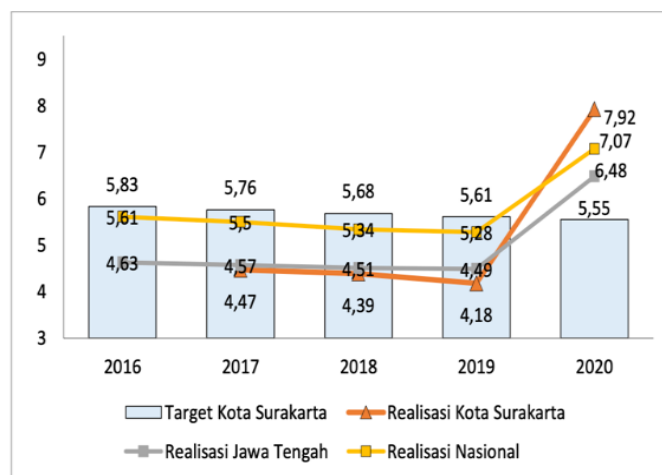


Fig. 6 Development of the Open Unemployment Rate Surakarta City, Central java province and national Year 2016-2020(%) (source: BPS Official Employment News)

CONCLUSION

The conclusion that can be drawn from the above analysis is that poverty, unemployment, and crime have a significant effect on HDI. Solo is the city that has the highest HDI rate but is followed by the same high unemployment and crime rate compared to the other 6 districts. So it is necessary to pay attention to the policy of reopening existing sources of employment in the city of Solo. As a result, during COVID-19, the policies that continue to be discussed are only about PPKM. The impact of the

policy of restricting work areas to reduce the spread of the virus resulted in an increase in unemployment and poverty but reduced the crime rate in the Soloraya area.

RECOMMENDATIONS AND CRITICISMS

For more research, we can explore spatial effects on HDI, poverty, unemployment, and crime rates. In addition, it can be further analyzed using the Small Area Analysis to find out which sub-districts or villages contribute significantly to the unemployment rate.

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