



# Effectiveness of Community Activities Restriction Enforcement Program in Handling COVID 19 Pandemic in Yogyakarta Province, Indonesia

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**Abstract.** Since the case, COVID 19 struck Indonesia on March 1st 2020. Some provincial governments have decided on micro policies based on national decisions, such as Community Activities Restriction Enforcement (PPKM). The aim of this study compared incidence COVID 19 in every regency in Daerah Istimewa Yogyakarta (DIY) province and compared total incidence and mortality in DIY before and after implementation of PPKM. A cross-sectional study design to compare incidence and mortality of COVID 19's case in DIY. The data was taken 43 days before and after implementation of PPKM from 11 to January 24th 2021, from database coronavirus in the DIY government office. The implementation started from 11 to January 24th 2021. The data analysis used Independent Sample T-Test and Spearman Correlation. Mean of daily case COVID 19 in two regencies before and after PPKM decreased such as Jogjakarta and Sleman (mean  $\pm$  SD 44.8  $\pm$  27.2, 80.5  $\pm$  32 vs 36.5  $\pm$  23.2, 69.1  $\pm$  44.5), while Bantul, Gunung Kidul and Kulon Progo increased (mean  $\pm$  SD 55.6  $\pm$  29.3, 13.8  $\pm$  13.9, 17.2  $\pm$  16.9 vs 70.6  $\pm$  36.1, 15.3  $\pm$  12.3 and 28.7  $\pm$  21.6). Bantul and Kulon Progo Regency was the most significant increasing case after PPKM ( $P < 0.05$ ). Meanwhile, the mortality rate in the DIY province after implementation of PPKM increased (mean  $\pm$  SD 4  $\pm$  3.7, 6.3  $\pm$  3.4,  $p = 0.04$ ). Incidence case was associated with mortality before PPKM ( $p = 0.005$ ,  $r = 0.42$ ), and after PPKM was not correlated ( $p = 0.25$ ,  $r = 0.17$ ). The implementation of PPKM was not effective in handling COVID 19's incidence and mortality in DIY province.

**Keywords:** PPKM · COVID 19 · Daerah Istimewa Yogyakarta province

## 1 Introduction

Since the coronavirus hit Indonesia in March 2020, the case gradually increased by more than 4 million cumulative cases [1]. The case concentrated on Java Island, where Jakarta, Central Java, West Java, and East Java are the most affected provinces, followed by Yogyakarta<sup>1</sup>. The COVID 19 forced National Government to establish some policies such as a large-scale social restriction (PSBB) and community activities restriction enforcement (PPKM). Both regulations are based on Law Number 6, 2018 about Health Quarantine and Law Number 4, 1984 about Contagious Disease Pandemic corroborated by Internal Affairs Ministry Instructions Number 22 and 23, 2021 [2–4]. The PPKM regulation pointed out every provincial government to uphold movement restriction in every essential or non-essential live sector based on level of the PPKM [4]. The essential sector must implement work from the office entirely, such as the health and security sectors. In contrast, education, the public, the service sector, and many more non-essential sectors must implement work from home policy [4].

At the first time PPKM was implemented around Indonesia, many experts argued about the effectiveness of this program. Moreover, PPKM is a policy to back up previous regulation PSBB that failed to handle the pandemic [5]. The government selected PPKM and PSBB to avoid national lockdown. Hence, PPKM is expected to overcome COVID 19's condition across Indonesia. In reality, several extensions of PPKM were executed due to the low decreasing of incidence rate [6]. The level of PPKM was increased gradually by the national government and reached the highest level (level 4) in the middle of July 2021, with more than 50 thousand daily cases. Despite the implementation of PPKM faced several troublesome, recent data shows the infection rate is under control. Massive health promotion through media to urge community implementing health protocol had been declared since the first time the outbreak supported regulation, PPKM and PSBB that pointed out mobility restrictions. Movement restriction is an essential point from the PPKM since controlling mobility has significantly impacted the incidence rate.

As the Ministry of Internal Affairs instructed, the Yogyakarta provincial government implemented PPKM from January 11st to 25th, 2021, in whole regencies. The implementation of PPKM such as work from home activities for office affairs, the online school in every education level, meanwhile for essential sector employed work from office by application health protocol strictly. The condition in Yogyakarta province was similar to the others; the case decreased insignificantly and must be extended several times. Total active case COVID 19 in Yogyakarta is 154.893, 148.260 recovered, and 5192 deaths [7]. In addition, the highest active case is in the Bantul regency, followed by the Sleman regency, yet the lowest one is Kulon Progo and Gunung Kidul regency. In early August 2021, the daily case reached 37.820 active cases, forcing the government to extend the PPKM. Until now, the level of PPKM is still in level 1 (the lowest one) to keep maintaining health protocol for every community mobility and mass event in Yogyakarta.

Study about the effectiveness of PPKM related to morbidity and mortality is limited in Indonesia. However, it has advantages to measure the effectiveness of implementation, evaluation, controlling and monitoring the policy. The effectiveness will continually evaluate to propose a suitable regulation during the pandemic. Thus, this study aims

to observe the effectiveness of PPKM in every regency in Yogyakarta province and compare the implementation on incidence and mortality rate. Since the level of PPKM drops to level 1, the relaxation of some events, community mobility and tourism agenda is already executed. The most important is maintaining the incidence rate and mortality rate under control by providing pertinent data based on this study.

## 2 Method

A cross-sectional study design collects the data based on <https://corona.jogjaprov.go.id/data-statistik> by the government of Yogyakarta. The total sample is incidence and mortality rate during 43 days before and after PPKM. The data was taken before and after implementation of PPKM in Yogyakarta province from January 11st to 25th, 2021, in every regency such as Yogyakarta city, Sleman, Bantul, Kulon Progo and Gunung Kidul. Before PPKM was November 28th, 2020 to January 9th, 2021 and after the pandemic was January 25th to March 8th, 2021. Assessment incidence and mortality rate before and after PPKM to measure statistical analysis by Independent T Test and Spearman Correlation Test coefficient with SPSS version 23.

## 3 Result and Discussion

Table 1 concluded that comparison incidence before and after PPKM was significantly in Bantul and Kulon Progo Regency. Average daily case in Bantul and Kulon Progo increased ( $55.6 \pm 29.3$  vs  $17.2 \pm 16.9$ , before PPKM vs  $70.6 \pm 36.1$  vs  $28.7 \pm 21.6$ , after PPKM). The rest of the regencies are slightly decreased. The entire case in Yogyakarta province increased ( $212.1 \pm 74.3$  vs  $220.5 \pm 85.1$ ), despite it is insignificant statistically. Table 2 elucidated that the mortality rate in Yogyakarta province increased and was associated statistically. In this situation, PPKM in Yogyakarta province did not control the mortality rate COVID 19 in the general population. Figure 1 concluded that incidence COVID 19 correlated with mortality rate before and after PPKM in Yogyakarta province. The mortality rate increased as long as the incidence rate augmented. This condition proves that PPKM was not effective in handling COVID 19 infection.

**Table 1.** Comparison COVID 19 incidence before and after PPKM

PPKM	Before PPKM						After PPKM					
	Jogja	Sleman	Bantul	Gunung Kidul	Kulon Progo	DIY	Jogja	Sleman	Bantul	Gunung Kidul	Kulon Progo	DIY
Mean	44.8	80.5	<b>55.6*</b>	13.8	<b>17.2*</b>	212.1	36.5	69.1	<b>70.6*</b>	15.3	<b>28.7*</b>	220.5
SD	27.2	32	29.3	13.9	16.9	74.3	23.2	44.5	36.1	12.3	21.6	85.1
Median	38	77	51	9	14	202	32	59	63	14	28	208
Min	5	23	5	0	0	55	6	9	12	0	1	100
Max	121	144	118	55	101	402	99	198	183	53	108	454

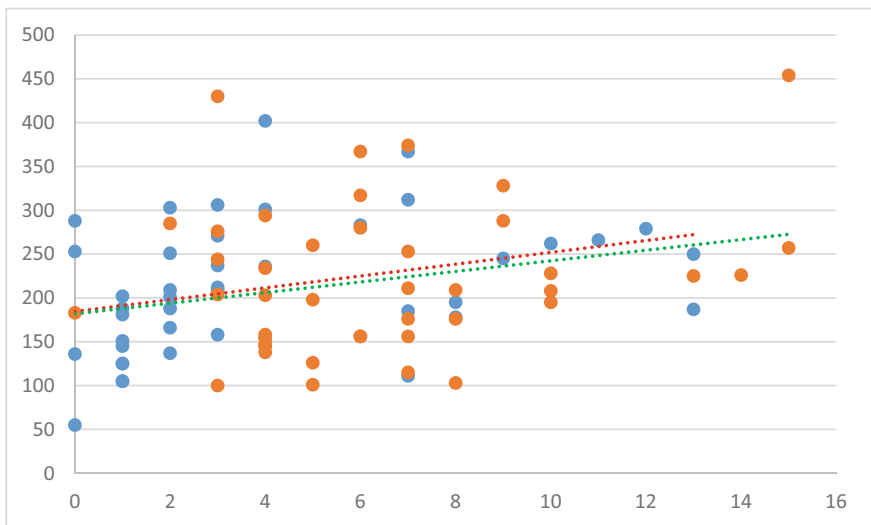
Bold and asterisk indicate p value significant < 0.05

**Table 2.** Comparison COVID 19 mortality before and after PPKM in DIY

PPKM	Before PPKM	After PPKM	P value*
Mean	4	6.3	0.04
SD	3.7	3.4	
Median	3	6	
Min	0	0	
Max	13	15	
Total	175	274	

SD: standard deviation

\*Independent T-Test value &lt; 0.05 before and after PPKMfig

**Fig. 1.** Correlation incidence and mortality rate COVID 19 in DIY before and after PPKM

Redline and blue dots are incidence and mortality before PPKM ( $p = 0.005$ ,  $r = 0.42$ ).

Greenline and orange dots are incidence and mortality after PPKM ( $p = 0.25$ ,  $r = 0.17$ ).

## 4 Discussion

Study about mobility controlling to handle pandemics in Indonesia that related to health policy is limited. How the PPKM has effectively tackled pandemics in Indonesia, particularly in Yogyakarta, gives additional information on the effectiveness in decreasing the incidence and mortality rate of the COVID 19. Two regencies in Yogyakarta province

show PPKM is ineffective, yet the other regencies display a decreasing incidence rate despite statistically insignificant in Table 1. Both regencies are located in a rural area that is a tourism destination. Moreover, the first week of PPKM's implementation in January 2021 was a holiday that seemed to be difficult to control movement. A strict regulation was performed in urban areas where cultural tourism place is located in the main cities of Yogyakarta. Some studies elucidate that mobility control was effective in handling incidence COVID 19. In China, most provincial offices implemented total lockdown, including in the main epicentre COVID 19 in Hubei, Beijing, and Guangdong, showing the decreasing transmission level below regulation [8]. Another study suggested that mobility control such as driving, walking, and transit in several WHO's region countries significantly reduces reproduction number at a time ( $R_t$ ) below 1 [9]. Among the countries, European countries have  $R_t$  decreased with mobility reduction than any others. This finding concluded that people in most European countries comply with the policy, including social distancing, hand-washing and many more [10].

Concerning mortality rate before and after PPKM policy in Yogyakarta province, the data showed no significant statistically. Total mortality before and after PPKM was 175 and 275, respectively. In addition association between incidence and mortality before PPKM was significant, yet after PPKM was not. It is concluded that PPKM policy is not adequate to decline the cases. People's compliance causes this condition to mobilize to Yogyakarta province amidst PPKM level and opening some tourism events during the regulation. A study contradicted this finding in Sweden that community mobility restriction (CMR) was associated with decreasing COVID 19's death despite neighbouring countries' ease of restriction [11]. Another study was conducted in European countries by using Oxford Strengthen Index (OSI) [10]. OSI is an indexing tool based on nine mitigation policies developed by the University of Oxford's Coronavirus Government Response Tracker. This tool is an index based on nine mitigation regulations: cancellation of public events, school closure, gathering restriction, workplace closure, border closure, internal movement closure, public transport closure, stay-at-home order, and stay-at-home policy. The mortality rate is not always related to the increasing incidence rate. For countries with a high vaccination rate, control spreading COVID 19 infection and resilience health system, the surge of infection does not compensate with high death in the population.

This study has a limitation that a cross-sectional study cannot predict policy effectiveness with the outcome, incidence, and mortality of COVID 19. However, a further longitudinal study is essential to predict between exposure and outcome. In addition, the assessment of the effectiveness of a health policy may consider other variables such as the characteristic of policy in every regency in Yogyakarta province that is not assessed in this study. Since the pandemic continues, policy intervention evaluation and monitoring, such as PPKM or other movement restriction rules, warrant a suitable approach to protect the community.

## 5 Conclusion

The PPKM policy in Yogyakarta province before and during pandemic COVID 19 is not practical to handle the spreading of community transmission. The increasing incidence

rate in Bantul and Kulon Progo regency proved this finding, despite some regencies slightly decreased. The cumulative case before PPKM increased by 220 cases than before PPKM, 212 cases. Mortality rate before PPKM correlated with increasing incidence rate but did not associate after PPKM. These findings suggested that a comprehensive approach to handling pandemics is essential not only to upholding mobility restriction per se but also to the compliance community to the regulation and commitment of the government to closure every public and private event.

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