LPEM-FEBUI Working Paper - 077
March 2024

ISSN 2356-4008

THE IMPACT OF COVID-19 ON VOTER TURNOUT IN THE 2020 REGIONAL ELECTIONS IN INDONESIA: DO VOTERS CARE ABOUT HEALTH RISKS?

Yoshua Caesar Justinus
Teguh Dartanto
Rus'an Nasrudin

LPEM-FEB UI Working Paper 077

Chief Editor : Chaikal Nuryakin
Editors : Jahen Fachrul Rezki
Setting : Rini Budiastuti

Institute for Economic and Social Research
Faculty of Economics and Business
Universitas Indonesia (LPEM-FEB UI)

Salemba Raya 4, Salemba UI Campus Jakarta, Indonesia 10430
Phone : +62-21-3143177
Fax : +62-21-31934310
Email : lpem@lpem-feui.org
Web : www.lpem.org

LPEM-FEB UI Working Paper 077, March 2024
ISSN 2356-4008

The Impact of COVID-19 on Voter Turnout in the 2020 Regional Elections in Indonesia: Do Voters Care About Health Risks?

Yoshua Caesar Justinus[1], Teguh Dartanto[2,★], and Rus'an Nasrudin[2]

Executive Summary
COVID-19, as an infectious disease, increases health risks and may potentially reduce political participation in general elections. Nevertheless, existing empirical research has yielded inconclusive results. This study aims to estimate the impact of COVID-19 on political participation in the 2020 Regional Elections in Indonesia. Applying the Difference-in-Differences (DiD) method, Propensity Score Matching (PSM)-DiD, and First-Difference regression on panel data spanning 2015 and 2020, our investigation revealed significant insights. Firstly, we observed a strong negative correlation between COVID-19 and voter turnout, particularly in regions with increased COVID-19 cases witnessing reduced turnout. However, we did not find robust evidence to support a causal link between COVID-19 and decreased voter turnout. Secondly, the surge in turnout during the 2020 regional elections seems attributable to a time-related trend. Thirdly, voter turnout positively correlates with regions featuring two or more competing candidates. Our study confirms that health risks do not necessarily deter political participation in Indonesia. The relatively lower awareness of health risks among the Indonesian population could influence the country's approach to managing COVID-19 and the future potential disease outbreak.

JEL Classification: D72; I18

Keywords
COVID-19 — health risk — local election — turnout — Indonesia

[1] *Institute for Economic and Social Research (LPEM), Faculty of Economics and Business, Universitas Indonesia*
[2] *Department of Economics, Faculty of Economics and Business, Universitas Indonesia*
★**Corresponding address**: Institute for Economic and Social Research (LPEM) Universitas Indonesia, Gedung Ali Wardhana, Campus UI Salemba, Salemba Raya St., No. 4, Jakarta, 10430, Indonesia. Email: teguh.dartanto@ui.ac.id.

1. Introduction

Election is essential in holding the incumbents accountable and sustaining democracy (Lijphart, 1997). A high turnout is desirable as it provides legitimacy for the election winners. In contrast, low turnout may not accurately reflect the people's will, unequal representation among parts of the population, and the possibility of voting for incapable candidates, which could lead to poor policy making, worsen public service quality, and massively impact people's lives (Rosema, 2007; Kirkland & Wood, 2017). The COVID-19 pandemic, however, has massively affected election preparation because of a sudden change in people's everyday life. Elections, among many other events, had to be re-prepared to prevent the Virus from spreading uncontrollably. According to the Institute for Democracy and Electoral Assistance (IDEA), local officials postponed 75 elections in countries and territories.

IDEA reports that most countries and territories that held elections amid the pandemic saw a decline in turnout. However, 30 elections saw an increase in turnouts. Some notable elections were in Singapore, South Korea, and the United States. Bicu & Wolf (2020) identify three factors that may have influenced the turnout increase in those countries: the existence and the scope of special voting arrangement (SVA), the political context of each country, and the timing of each election. They find that those who observed higher turnout had either more ways of voting, higher political stakes, or had held elections before COVID-19 was declared a pandemic.

In the case of Indonesia, the nation's General Elections Commission (*Komisi Pemilihan Umum*, subsequently stated as KPU) had initially planned to hold the regional election to elect city majors/regents/governors on 23 September 2020. The rapid spread of COVID-19 forced President Joko Widodo to move Election Day to December 9, with a further postponement being possible if the pandemic had not been under control by then. The government subsequently focused on strengthening health protocols, increasing the number of polling stations, and arranging SVA exclusively for COVID-19 patients.

The elections proceeded as scheduled, unfolding nine months into the pandemic. Recalling the factors identified by Bicu & Wolf (2020), it was still possible to observe higher or lower turnout. Some surveys indicated a potentially low turnout as voters hesitated to turn out (Kompas.com, 2020b; Bisnis.com, 2020). However, the 2020 regional election turnout might be unaffected by COVID-19, as voters and candidates may not prioritize health risks. The Elections Supervisory Agency (*Bawaslu*) reported numerous candidates violating health protocols and organizing mass gatherings during the registration at regional KPU offices, totaling around 237 violations in the initial 1tendays of the campaign period.

The empirical studies on the impact of COVID-19 on turnout are relatively new, given the recent emergence of the disease. New strands of literature conclude that the COVID-19 pandemic negatively affected election turnout (Baccini et al., 2021; Santana et al., 2020; Fernandez-Navia et al., 2021; Chirwa et al., 2022; Noury et al., 2021; Picchio & Santolini, 2022). These results are consistent with previous studies concerning the impact of infectious diseases such as

H1N1 and Ebola that generally also conclude the negative effect on turnout (Urbatsch, 2017; Campante et al., 2020; Gutiérrez et al., 2020). One exception is Abad & Maurer (2021), who found no impact of the 1918 Spanish Flu on the 1918 US midterm elections.

The relationship between the disease and turnout can be explained through a cost-benefit analysis of voting behaviour introduced by Downs (1957). An individual's decision to vote is based on calculating the costs and benefits of the action. Meanwhile, Harder & Krosnick (2008: 527) state that an individual's turnout behaviour is a multiplicative function of the motivation an individual has, the ability to vote that an individual possesses, and the difficulty an individual must face. Despite slight differences between their views, both fundamentally imply that a solid force must compel her to cast her vote.

Using the cost-benefit framework, political scientists and economists tried to shed light on the electoral impact of external shocks such as natural disasters, terrorist attacks, and even rain by analysing the benefits and costs associated with each shock. An external shock, such as terrorist attacks, has been found to have increased the use of voting by increasing the perceived importance of the upcoming elections (Bellows & Miguel, 2009; Blattman, 2009; Robbins et al., 2013). On the other hand, external shocks such as natural disasters have been generally found to have hampered the cost of voting by reducing an individual's economic resources (Sinclair et al., 2011; Rudolph & Kuhn, 2018).

In the case of Indonesia, despite concerns about the 2020 election turnout being low, the average turnout of 270 districts was announced in February 2021 at 76.09 percent, just slightly below the General Elections Commission target of 77.5 percent. Compared to the 2019 Presidential and Legislative elections, the 2020 cycle observed a 5.9 percentage points (7.7 percent) lower turnout rate. However, the 2020 cycle kept a seven percentage-point (10 percent) higher turnout than the 2015 election, wherein the districts holding the elections were the same (Figure 1). The trend has also shown an upward trend since the 2014 Presidential Election.

Various factors, including social distancing, mobility restrictions, the potential inability of infected voters to participate, and heightened health risks, may not conclusively impact the 2020 election turnout. Unlike prior studies affirming decreased turnouts during contagious diseases, the 2020 Indonesia regional election presents a deviation from the expected trend, evident in the increased turnout depicted in Figure 1. This phenomenon prompts two key questions: Does COVID-19 influence Indonesian election turnout, challenging prevailing assumptions? Second, is the observed surge in turnout indicative of a sustained trend, echoing patterns observed since 2014? Exploring these queries is crucial for a nuanced understanding of the pandemic's impact on democratic processes.

Unravelling the answer to this question holds valuable insights for the expanding literature in this domain. Suppose health risks had a negligible impact on turnout. In that case, it suggests that Indonesians lean towards risk-taking behaviour and may be less prepared to navigate health crises, potentially influencing the government's emergency response policies. On the other hand, if the observed increase in turnout is a temporal trend, it bestows solid legitimacy upon the existing government bodies, establishing a robust foundation for future policy implementations. However, it's essential to consider that increased turnout may also result from vote buying, contributing to elevated political costs and potentially undermining the health of democracy (Muhtadi, 2019; Hicken et al., 2022).

The next section explores a comprehensive literature review on voter turnout. Section 3 provides an in-depth exploration of data and methodology, encompassing an analysis of the recent voter turnout conditions in Indonesia, our identification strategy, and the application of statistical methods such as Difference in Difference (DiD), Propensity Score Matching-DID, and First Difference Regression. Section 4 presents the estimation results and associated analyses, and the final section offers concluding remarks to summarize our findings.

2. Literature Review on Election Turnout

Down (1957) introduces a theory of the calculus of voting, in which each voter is assumed to calculate the costs and benefits associated with casting a ballot (Aldrich, 1993; Blais, 2000,2006). Therefore, each eligible citizen votes only if her candidates of choice provide a reward considered beneficial and the option offers benefits that suit her the most. Downs (1957) laid a foundation for further studies in their quest to understand one's decision whether to cast or not, formulated in the following equation:

$$R = (B)(P) - C + D \tag{1}$$

Where R is the total reward in which a citizen will gain from voting that consists of four components: the perceived benefit an individual ensues from having her preferred candidate win, denoted by B; an individual's perception of the probability that her vote will have a significant part in changing the election outcome, denoted by P; the costs an individual must pay for her to be able to vote. The prices, therefore, have two distinctive sequences: the first is when a voter prepares to conduct thorough research on the running candidate(s) and their ins and outs. The second sequence is when a voter decides to cast her ballot. This results in her having to go to the polling station, spend a few minutes or even hours in line, cast the ballot, and go home. While doing all those actions, she spends time, money, and other resources deemed vital by her to complete the act of voting. This is denoted by C and the psychic satisfaction the person would gain from the vote represented by D.

In the development of turnout studies, the calculus of voting has become a common feature in analyzing the electoral impact of external shocks such as natural disasters and terrorist attacks. Past studies generally find that shocks related to terrorism have a positive effect on turnout due to what is called a 'mobilization effect' which occurs when people rally around a common cause because of a tragedy (Bali, 2007; Bellows & Miguel, 2009; Blattman, 2009; Montalvo, 2012; Robbins et al., 2013). Meanwhile, events related to natural disasters usually negatively affect turnout due to an individual's decreased economic capacity (Sinclair et al., 2011; Rudolph & Kuhn, 2018). Some studies do not

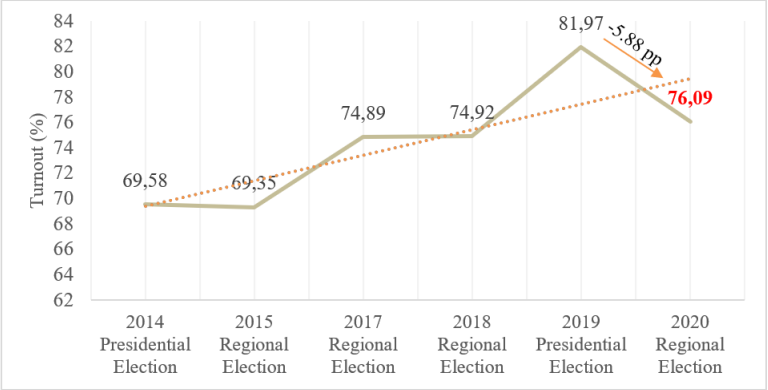

Figure 1. Turnout in the Last Six Nationwide Elections
Source: Authors compilation based on KPU dataset

find any effect of external events on turnout (Remmer, 2014; Bodet et al., 2016; Bovan et al., 2018). Moreover, Harder & Krosnick (2008) find factors commonly used in determining voter turnout and split those into two categories: (1) socioeconomic, demographic, and social conditions, such as population density, income per capita, and unemployment rate; and (2) political circumstances in a specific region, such as the closeness of the race.

3. Data dan Method

3.1 Identification Strategy

This study uses a balanced panel of regions that held simultaneous regional elections in 2015 and 2020. The data were gathered from three sources: *Satuan Tugas* (Task Force) COVID-19 (Satgas COVID-19 henceforth), *Komisi Pemilihan Umum* (General Election Commission) (KPU henceforth), and Statistics Indonesia (BPS henceforward). In the context of regional elections in Indonesia, regions with local elections in 2015 would repeat the process in 2020 because the term for the mayor or regent is five years. A balanced panel is crucial to studying changing turn-out behavior because it ensures consistent observation of entities over time, allowing for accurate causal assessments, robust statistical analyses, and effective control of time trends (Woodridge, 2015). This minimizes bias, enhances comparability, and strengthens the validity of findings.

Considering the existing literature, we investigate how the COVID-19 pandemic influenced the 2020 Regional Election turnout using a difference-in-difference approach as follows:

$$\begin{aligned} Turnout_{it} &= \beta_0 + \beta_1 * Year_t + \beta_2 * COVID_i \\ &\quad + \beta_3 * Year_t \times COVID_i + X'_{1it}\chi + X'_{2it}\phi \\ &\quad + \theta_i + \varepsilon_{it} \end{aligned} \tag{2}$$

The impact evaluation must include the interaction effect of time and treatment variables, thus avoiding potentially incorrect inference. $Turnout_{it}$ is the outcome variable, defined as the share of eligible voters who cast their ballot on election day in district i in year t. $Year_t$ stands as an indicator variable that equals one for the 2020 elections and zero for the 2015 elections. $COVID_i$ serves as an indicator variable for measuring the prevalence of the COVID-19 virus in each region, in which 1 represents a high risk, and 0 illustrates a low risk. We also split districts into four categories: red zone for high risks, orange zone for moderate risks, yellow zone for low risks, and green zone for no recorded positive cases or there have been cases yet no new additional cases recorded in the last four weeks and the recovery rate is 100%. In the binary setting of COVID, we grouped high and moderate risks into high risk and the previous two groups into low risk. We found that 210 (80%) of districts were considered high risks by the *Satgas* COVID-19.

As a disclaimer, it is essential to address the concern of the true extent of the COVID-19 incidence. The official figures have long been suspected to be under-reporting due to a lack of testing and contact tracing. A new report confirms this suspicion, suggesting that 15 percent of Indonesians contracted the Virus between March 2020 and January 2021 (Allard, 2021). Meanwhile, the official figures record that only 0.4 percent of Indonesians had become infected by the Virus. Given the potential dynamic change in districts (regencies and cities) examined in this study, the significant disparity between the official and suggested numbers caused by different testing techniques may prove vital in assessing the impact. For reasons of convenience and data availability, we carry on with the data available to the public. The following variables are $Year_t * COVID_i$, an interaction term between the indicator variable $Year_t$ and $COVID_i$, measurement of the prevalence of COVID-19 in city/regency i around the time of election. The interaction term is the variable of interest in this research which captures the impact of COVID-19 on election turnout.

The last three variables are control variables. X'_{1i} refers to the vector of demographic and socioeconomic variables, including population density, Human Density Index (HDI), mean years of schooling, unemployment rate, and a dummy variable indicating a given district's administrative status (equals one for city and zero for regency). X'_{2i} refers to vectors of political variables, including a number of polling station, a head-to-head dummy (equals one if a mayor or regent faced his deputy), multiple candidates dummy (equals one if a district witnessed two or more competing candidates), and a coalition gap representing the difference of percentage support received by each candidate from the local parliament. For instance, if the coalition of parties holding 60% of the regional council's seats nominates can-

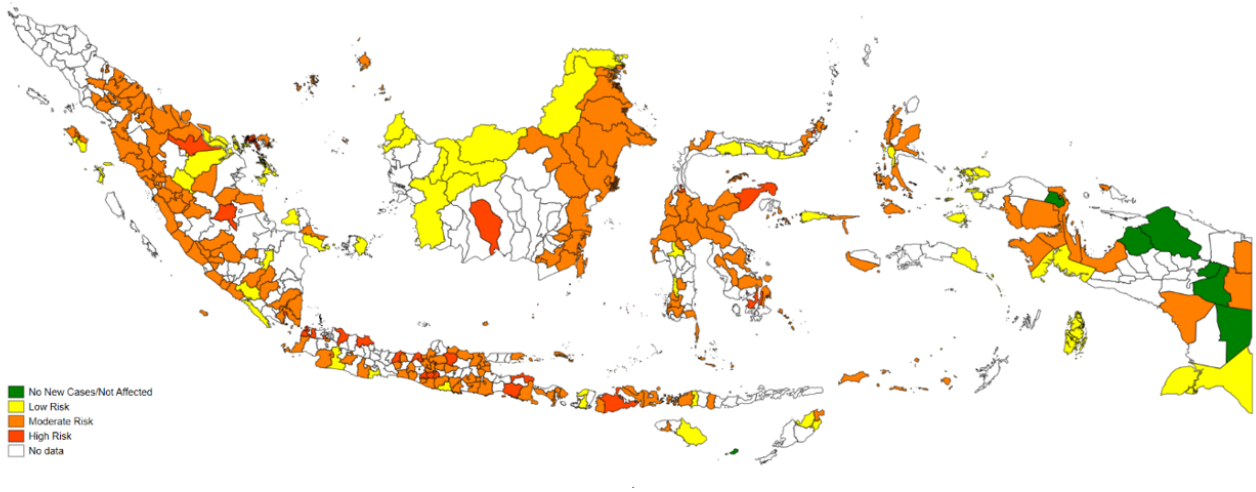

Figure 2. Regional Covid-19 Risk Classification in 2020 (SUTVA Assessment)
Source: Author's Illustrations
Note: The Stable Unit Treatment Value Assumption (SUTVA) assumption is satisfied for the advanced causal inference analysis.

didate A, another coalition of parties with 35% nominates candidate B, then a coalition gap is 25%. Finally, the last components of the equation are θ, which represents the city-regency fixed effect, and ε_{it}, the heteroskedastic-robust error term clustered in the city-regency level. The city-regency (district) fixed effects anticipate each district's potential time-invariant unobserved heterogeneity.

Given the nature of this research as an observational study and our aim to infer causality, we must be certain that our research satisfies two assumptions in a difference-in-differences setting and is free of bias. The first assumption is the fulfilment of the parallel trend that the outcomes between treatment and control groups show the same pattern in pre and post-intervention. Typically, the parallel trend requires us to observe at least two pre-treatment periods to determine whether the parallel trend requirement is met. Meanwhile, this study only uses two serial observations. To remedy the problem, one can perform placebo regression (Gertler et al., 2016). One way to perform placebo regression is to perform additional difference-in-differences estimation using a "fake outcome." In this setup, any variable unaffected by the treatment can be the outcome variable. We can be certain that the parallel trend is upheld if we find no impact.

We then conduct the placebo regression to defend the validity of the parallel trend assumption while casually anticipating the potential confounding effect from precaution (education) and reverse causation (political factor). Table 1 shows no impact of the treatment on the two outcomes used, mean years of schooling and coalition gap. Therefore, this research is certain that the parallel trend assumption is satisfied, and the analysis can proceed.

The second critical assumption to be satisfied for a valid causal inference is the Stable Unit Treatment Value Assumption (SUTVA) (see Figure 2). This assumption requires that an outcome of a particular observation should be contingent only on the treatment assigned to it, not the other treatment given to its surroundings. In the context of our study, this research is compelled to check whether a district's turnout was solely affected by the risk it faced or the risk of other surrounding districts.

Table 1. Placebo Regression for Parallel Trend Assessment

VARIABLES	(1) Mean Years of Schooling	(2) Coalition Gap
The year 2020	0.627***	9.391
	(0.055)	(9.519)
COVID	2.685***	-42.11
	(0.0489)	(31.90)
The Year 2020 x COVID	-0.0691	2.243
	(0.0588)	(6.397)
Density	-0.0001	-0.0018
	(0.0001)	(0.0121)
Unemployment Rate	-0.441	-62.08
	(1.113)	(147.4)
Municipality Dummy	6.922***	-51.46
	(0.0629)	(81.29)
Number of Polling Stations	1.04e-05	0.0033
	(7.31e-05)	(0.0092)
Incumbents Head-to-Head Dummy	0.0288	-0.875
	(0.0458)	(4.219)
Coalition Gap	3.41e-05	
	(0.0007)	
Mean Years of Schooling		0.587
		(11.78)
Constant	2.109***	53.66**
	(0.0541)	(25.32)
Observations	522	522
R-squared	0.993	0.597

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Author's Calculations

We must address the potential bias in determining whether a district is considered a treatment or a control. To ensure an unbiased comparison between COVID-19 affected and unaffected districts, we employ Propensity Score Matching (PSM). PSM, introduced by Rosenbaum & Rubin (1983), is a statistical method designed to simulate the conditions of a randomized controlled trial in observational studies. It works by matching treated and untreated units based on their likelihood of receiving treatment, in this context, being affected by COVID-19. Without this method, directly

comparing the two types of districts might yield skewed results due to intrinsic differences like socioeconomic factors or historical voting behaviours. By using PSM, we strive to balance these variances and isolate the true impact of COVID-19 on election turnout. This method requires the determination of covariates, variables that could influence whether observations are classified as treatments or controls (Harris & Horst, 2016). We selected population density, HDI, unemployment rate, and the district dummy. After employing PSM, we were left with 186 observations each year to proceed with our analysis. Alongside PSM, this research will also utilize a first-difference estimator as a robustness check.

3.2 Context: The 2020 Indonesian Regional Elections and The Risks of COVID-19

The 2020 Regional Elections saw 714 candidates competing for nine gubernatorial, 224 regency, and 37 mayoral seats across the country. Slightly more than half of the elections were held in Sumatra and Java (52%), in which Covid cases were more prevalent than in other regions. Figure 2 shows the health risks caused by COVID-19 for each area holding the 2020 election, while Figures 3 and 4 show the maps depicting the turnout dynamics in the 2015 and 2020 elections.

The information on regions in Figure 2 is gathered from the national COVID-19 task force, where in each district (city and regency) in Indonesia is assessed by a set of criteria and then categorized into four categories based on the score: 0–1.80 for regions with high risk, 1.81–2.40 for moderate risk, 2.41–3.00 for low risk, and above 3.00 for no cases/not affected. This research split the regions into two groups: (1) treatment for regions facing high and moderate risk; and (2) control for regions facing low risk and currently unaffected or having no new cases in the four weeks before 29th November 2020. For a robustness check, this study also categorizes districts into four categories: low, moderate, and high risk and no new COVID-19 case as a control group. Figure 2 reveals a nuanced landscape among the 261 regions hosting local elections in 2020. Notably, 7 regions, potentially situated in Papua-Eastern Indonesia, reported zero cases. Furthermore, the distribution includes 44 regions classified as low risk, 186 as moderate risk, and 24 as high-risk areas, showcasing a varied risk profile across the electoral landscape.

Our identification relies on how regional turnout growth differs between two types of regions: high and low risk concerning COVID-19. Outcome variations (Figures 3 and 4) suggest a considerable size between the region's variation and minor overtime turnout changes, leading to a pessimistic guess of the effect. Sparsely regional distributed risk classification support for identification and less concern on spill over issues. Yet, the remaining potential problems could be present (e.g., voluntary precaution/anticipation and reverse causation effects).

3.3 Descriptive Statistics

Table 2 shows the descriptive statistics. We observe an increase in average density from 813.42 people per square kilometre to 847.45 people per square kilometre. The average unemployment level also increased slightly, from 5.2 percent in 2015 to 5.3 percent in 2020. This is no surprise, given that the pandemic has displaced many workers from their jobs. The HDI average also goes from 66.33 to 68.14, an increase of nearly two points. The average mean years of schooling also show an improvement, going from 7.71 to 8.28 years. This means that in the 261 districts studied in this research, there has been an improvement in the education aspect, with students more likely to reach the eighth year of their education.

The number of polling stations increased sharply, averaging nearly 876 polling stations in each district in 2015 and almost 1053 polling stations in 2020. The sharp increase is attributed to the KPU's decision to provide more stations to limit the number of voters to a maximum of 500 voters in each station. The average coalition gap between the candidates also witnesses a pretty sharp increase. In 2015, the parliamentary seat gap between the most significant and second-biggest coalition was 18.35 percentage points. In 2020, the gap widened to 30.32 percentage points. This indicates that the 2020 elections featured fewer candidates and presented a more intricate challenge for candidates affiliated with lesser-known parties in local parliaments. These candidates faced a more challenging task of rallying support from other parties as the political landscape shifted towards avoiding surprises and prioritizing the consolidation of power.

4. Results and Discussion

4.1 Estimation Results

In our analysis, we employ DID and PSM-DID estimation techniques to evaluate the treatment effect of COVID-19 on the regional election turnout. Table 3 articulates results under various combinations of control variables. A discernible positive temporal effect emerges, indicating that the average 2020 turnout is higher than the average 2015 turnout. More specifically, augmentation in turnout across regions in 2020 ranges from 3.30 percent to 5.66 percent relative to the 2015 election, ceteris paribus. The treatment indicator also registers a pronounced negative impact, implying that regions with high to moderate risk are poised to witness a decline in electoral participation. Intriguingly, the interaction variable of Year*Covid as a variable of interest does not significantly impact the turnout after controlling for socioeconomic, political, time, and municipality-regency fixed effects (Table 3). Our study statistically confirms that the COVID-19 incidence does not affect turnout differently in 2020. Our findings remain consistent across all model specifications in the DID and PSM-DID setups. Applying PSM-DID will potentially improve the balance of observed factors between treated and untreated groups and will reduce bias in estimating the impact of COVID-19 on regional election turnout.

Instead of relying solely on binary variables indicating whether a region is classified as high/moderate risk or low risk for COVID-19, Table 4 presents estimation results incorporating a four-category classification (no risk, low risk, moderate, and high risk) of regions based on their COVID-19 Risk. This expanded classification eliminates the statistical consequences of grouping regions into two or more categories. Our estimation results affirm a statistical

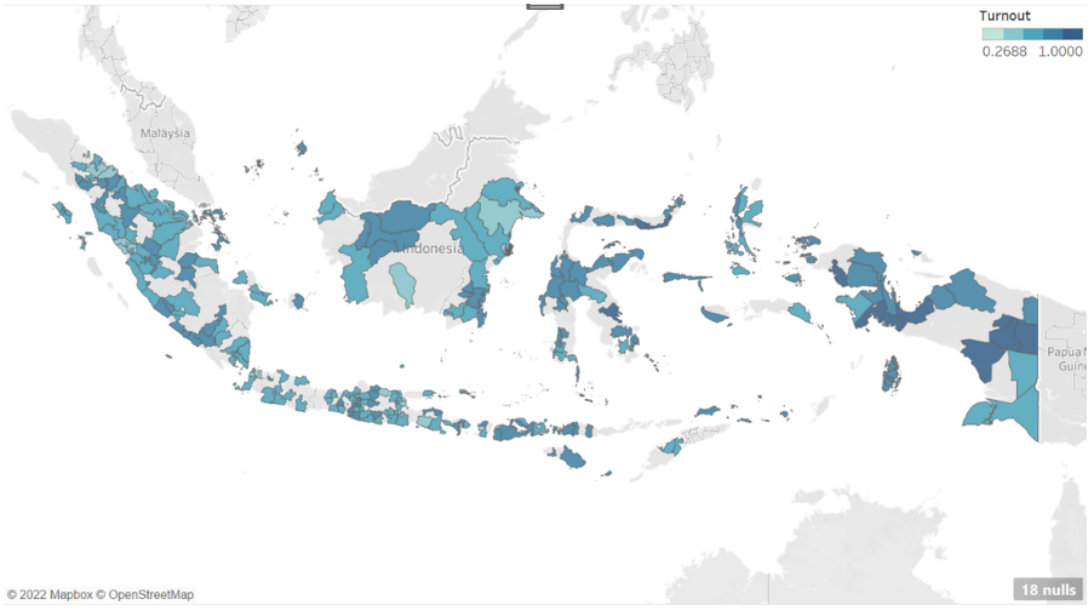

Figure 3. The 2015 Elections Turnout
Source: Author's Illustrations

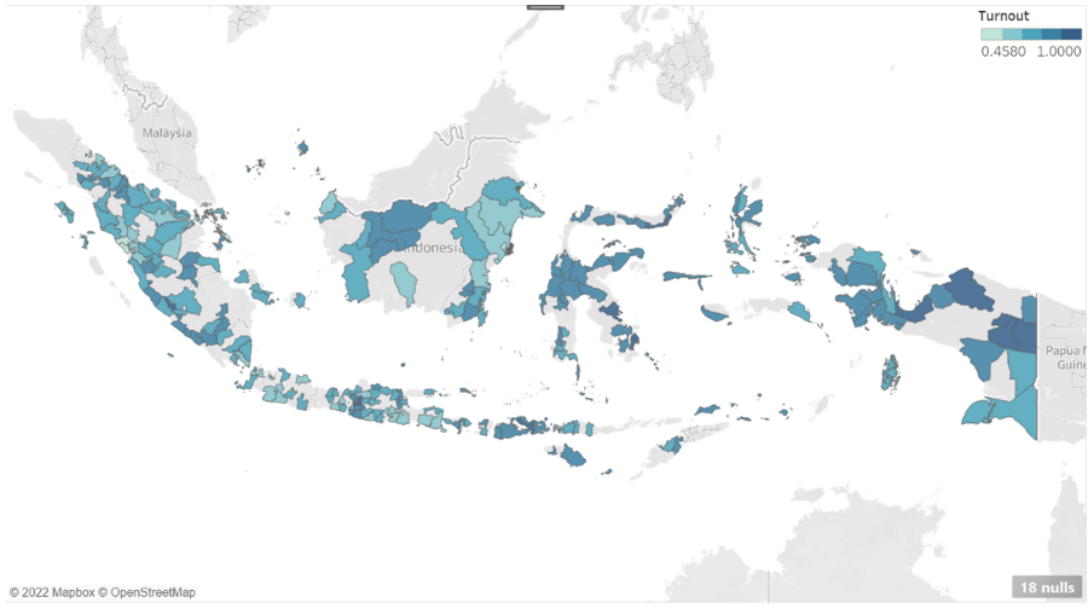

Figure 4. The 2020 Elections Turnout
Source: Author's Illustrations

correlation between COVID-19 risk and regional election turnout. However, it's important to note that our study falls short of providing robust evidence supporting the significant impact of COVID-19 on the decrease in regional election turnout in 2020. Although our findings differ from many other scholarly views emphasizing the & effects of the pandemic on turnout, they align with the findings of Abad & Maurer (2021), who found no impact of the 1918 Spanish Flu on the 1918 US midterm elections.

When considering additional variables, the Human Development Index (HDI) and Mean Years of Schooling reveal nuanced significance levels. Regions with higher HDI scores exhibit a subtle but discernible uptick in electoral participation in specific models. Simultaneously, Mean Years of Schooling consistently establish itself as a noteworthy predictor of voter turnout in specified models. This suggests that beyond economic indicators, the educational landscape plays a pivotal role in shaping civic engagement, with regions boasting higher educational attainment witnessing more pronounced effects on electoral participation, as discerned through the lens of the specified models. In regions with two or more competing candidates, turnout increased by 4.39 to 4.60 percent. This indicates that more candidates mean more political competition, attracting voters to cast the ballot.

4.2 Discussion

Our findings (Tables 3 and 4) contrast with previous studies like Reitan (2003), Mattila et al. (2013), and Rapeli et al. (2020), which emphasized the significant deterrent effect of public health risks on voter turnout. The expected decrease

Table 2. Summary Statistics for All Observations

	Baseline=2015				
Variable	Obs	Mean	Std. Dev.	Min	Max
Turnout	261	0.70	0.10	0.27	1.00
The year 2020	261	0	0	0	0
COVID	261	0	0	0	0
Density	261	813.42	1890.0	0.90	11133
Human Development Index	261	66.33	6.2	39.68	81.65
Mean Years of Schooling	261	7.71	1.5	2.06	11.57
Unemployment Rate	261	0.052	0.03	0.00	0.15
Municipality Dummy	261	0.14	0.35	0	1
Number of Polling Stations	261	876	873	45	5246
Incumbents Head-to-Head Dummy	261	0.17	0.38	0	1
Coalition Gap	261	18.35	19.61	0.0	100
Multiple Candidates Dummy	261	0.98	0.12	0	1

	Treatment Period=2020				
Variable	Obs	Mean	Std. Dev.	Min	Max
Turnout	261	0.76	0.09	0.46	1
The year 2020	261	1	0	1	1
COVID	261	0.80	0.40	0	1
Density	261	847.45	1977.4	1.04	12403
Human Development Index	261	68.14	6	43.24	83.01
Mean Years of Schooling	261	8.28	1.4	2.79	11.81
Unemployment Rate	261	0.053	0.02	0.01	0.16
Municipality Dummy	261	0.14	0.35	0	1
Number of Polling Stations	261	1052	1105	59	6872
Incumbents Head-to-Head Dummy	261	0.18	0.38	0	1
Coalition Gap	261	30.35	29.33	0	100
Multiple Candidates Dummy	261	0.90	0.29	0	1

Source: Author's Calculations

in voter turnout due to public health risks, government travel restrictions, and infected voters' reluctance does not occur in Indonesia.

We offer several reasons and transmission mechanisms to explain why COVID-19 did not decrease turnout in the 2020 regional elections in Indonesia. One possible explanation is the prevailing public sentiment towards the pandemic's impact, as surveys conducted by BPS and other institutions suggest a certain level of indifference among the populace. BPS reveals that up to 25 percent of the respondents were unruly when following health protocols. Despite over 90 percent compliance with mask-wearing mandates, adherence to other protocols—such as hand sanitation, crowd avoidance, and social distancing—appears to wane.[1] A considerable proportion of non-compliant respondents cited minimum legal repercussions, absence of proximate infection cases, and perceived impediments in their professional engagements. This sentiment is echoed by the Satgas COVID-19 spokesperson, who, in a December press briefing (Silmi, 2021), highlighted the sub-optimal adherence rates to health protocols, underscoring that a compliance rate of 75 percent is imperative to manage the pandemic's progression effectively.

Another concern is that only two percent of Indonesia's total municipalities and regencies followed the health protocols recommended by the nation's task force. His concerns are confirmed by one survey that reveals the downward trend in citizens' fear of contagion. In late 2020, it dropped sharply.[2] Around 84 percent of respondents feared being infected in the October survey, while the figure dropped to 71 percent in December. The survey concludes that the lower proportion of respondents fearing contagion is possibly attributed to the public's worsening trust in the government's official COVID-19 figures due to the lack of transparency of incidence figures (Okenews, 2020).

A Reuters report has seemingly confirmed long-standing suspicions about under-reporting issues with government-reported figures, indicating a significant disparity between official and actual COVID-19 numbers. This discrepancy may lead to two outcomes: firstly, people may underestimate the actual spread of COVID-19, evident during holidays like Eid al-Fitr, Eid al-Adha, and year-end breaks, where large crowds gathered despite government warnings (Tempo.co, 2021). Secondly, uncertainty about the pandemic's end can breed pandemic fatigue, exacerbated by Indonesia's COVID-19 peak in January and February 2021, 11 months after the first confirmed case. These factors, compounded by the central role of cultural, social, and religious events, may erode compliance with government protocols.

The waning public adherence to health protocols during the COVID-19 pandemic, and scepticism regarding government-issued COVID-19 data, and pervasive fatigue from prolonged exposure to pandemic stressors, did not hinder public involvement in the 2020 regional elections. Despite these obstacles, voters displayed resilience and actively engaged in the electoral process, showcasing a commendable level of civic responsibility and commitment to democratic principles. However, this scenario is also detrimental to the community, as people's negligence and underestimation of health risks complicate mitigation efforts and the handling of COVID-19 and other potential disease outbreaks in the future.

[1] For more details, see https://covid-19.bps.go.id/ at the section '*Survei Perilaku Masyarakat di Masa Pandemi*'.

[2] For more details, see https://saifulmujani.com/kepercayaan-publik-nasional-pada-vaksin-dan-vaksinasi-covid-19/.

Table 3. Regression Results of Election Turnout (Two Categories of COVID-19)

Variable	DID				PSM-DID			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
The year 2020	0.057***	0.054***	0.036**	0.033**	0.055***	0.055***	0.040**	0.042**
	(0.013)	(0.014)	(0.016)	(0.017)	(0.015)	(0.015)	(0.017)	(0.018)
COVID-19	-0.380***	-0.370***	-0.457***	-0.444***	-0.376***	-0.367***	-0.425***	-0.408***
(0 = low risk; 1 = high or moderate risk)	(0.027)	(0.026)	(0.054)	(0.054)	(0.041)	(0.039)	(0.058)	(0.058)
The year 2020 x COVID	0.005	0.006	0.007	0.007	0.008	0.009	0.008	0.009
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Density	-0.000004	-0.000003	-0.00000	0.00000	0.00003	0.00004	0.00003	0.00004
	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00015)	(0.00014)	(0.00016)	(0.00014)
HDI	0.003	0.003*			0.002	0.002		
	(0.002)	(0.0017)			(0.003)	(0.003)		
Mean Years of Schooling			0.0420**	0.0424**			0.031	0.0283
			(0.020)	(0.020)			(0.022)	(0.022)
Unemployment Rate	-0.0745	-0.0578	-0.0512	-0.0332	-0.0126	-0.0293	-0.00771	-0.0209
	(0.249)	(0.253)	(0.249)	(0.252)	(0.301)	(0.300)	(0.297)	(0.296)
Municipality Dummy	-0.226***	-0.215***	-0.460***	-0.444***	-0.217***	-0.207***	-0.378**	-0.347**
	(0.041)	(0.039)	(0.141)	(0.141)	(0.062)	(0.060)	(0.151)	(0.150)
Number of Polling Stations	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00003	0.00002
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00003)	(0.00003)	(0.00003)	(0.00003)
Incumbents Head-to-Head Dummy	-0.012	-0.014	-0.014	-0.015	-0.013	-0.013	-0.013	-0.013
	(0.010)	(0.010)	(0.001)	(0.010)	(0.011)	(0.011)	(0.011)	(0.010)
Coalition Gap	-0.0004**		-0.0004**		-0.0003		-0.0003	
	(0.0002)		(0.0002)		(0.0002)		(0.0002)	
Multiple Candidates Dummy		0.043***		0.044***		0.046**		0.044**
		(0.015)		(0.014)		(0.019)		(0.019)
Constant	0.881***	0.803***	0.906***	0.838***	0.881***	0.816***	0.916***	0.865***
	(0.079)	(0.074)	(0.046)	(0.046)	(0.124)	(0.121)	(0.051)	(0.051)
Municipality-Regency Fixed Effect	YES	YES	YES	YES				
R-Squared	0.919	0.92	0.921	0.922	0.912	0.915	0.913	0.915
Observations	522	522	522	522	372	372	372	372

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Source: Author's estimations

Second, Indonesia is a developing country marred by an increasing trend of corruption, clientelism, and vote-buying practices, as noted by Muhtadi (2019), which, according to Stockemer (2015), has a different turnout function compared to the turnout function of developed countries. The difference is attributed mainly to the role of clientelism in developing countries' electoral dynamics, where transactions between competing candidates and voters are more common in countries with less developed institutions. Given that the pandemic has devastated people's economic capacity and mobility and lowered income for most households, there is a real possibility that vote-buying practices might play a more frequent role in the 2020 election. Given the impact of the pandemic on people's livelihoods, there were concerns that vote-buying practices would become more prevalent in the 2020 elections (Merdeka.com, 2020). This concern has been repeatedly voiced by the Indonesian government's anti-corruption agency, widely known as *Komisi Pemberantasan Korupsi* (KPK), as well as KPU (The Jakarta Post, 2020). An expert had also warned that the devastating impact of the pandemic on people's financial situation increased the tolerance of vote-buying practices, as indicated by a survey that finds that people are more afraid of hunger than they are of contracting the Virus (Kompas.com, 2020a).

4.3 Robustness Check

In examining the robustness of our model, we employ the first difference estimator and eliminate the municipality-regency fixed effects. We integrate a delta time dummy into the regression to address the time trend, which controls time-varying yet panel-constant unobserved effects. This approach, advocated by Wooldridge (2015), suggests including a time dummy when a widespread trend affecting outcomes in a specific year is justified. In the case of our study, employing a time dummy in the first difference specification is warranted due to the distinct and pronounced impact of the COVID-19 pandemic in 2020, unlike in 2015. Despite coefficient similarities between the first difference regression and standard DiD regression, the former generally exhibit lower standard errors. Notably, Table 5 confirms that the rise in election turnout likely stems from a time-trend phenomenon, supported by the delta time coefficient's robustness, consistency, and significance across all model specifications.

Our study further corroborates earlier findings, as presented in Tables 3 and 4, indicating that COVID-19 does not necessarily dampen political participation in the 2020 regional elections in Indonesia. We find the lack of significant coefficients across all model specifications. Appendix 1 supplements this observation by demonstrating no substantial impact of different risk levels on turnout. Additionally, concerning control variables, our study yields consistent results: a positive correlation exists between turnout and the mean years of schooling and multiple candidates in election races. Conversely, weakly negative correlations emerge in the relationships between turnout and incumbents' head-to-head as well as coalition gap.

5. Conclusion

COVID-19 has been widely recognized for its potential to heighten health risks and dampen political engagement

Table 4. Regression Results of DID & PSM-DID (Four Categories of COVID)

Variable	DID				PSM-DID			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
The year 2020	0.045*	0.047*	0.019	0.021	0.044*	0.049*	0.026	0.032
	(0.025)	(0.025)	(0.026)	(0.026)	(0.026)	(0.025)	(0.028)	(0.028)
COVID-19								
Low Risk	-0.401***	-0.389***	-0.609***	-0.590***	-0.391***	-0.379***	-0.531***	-0.497***
	(0.043)	(0.042)	(0.129)	(0.129)	(0.063)	(0.061)	(0.138)	(0.138)
Moderate Risk	-0.386***	-0.373***	-0.469***	-0.451***	-0.379***	-0.369***	-0.432***	-0.412***
	(0.028)	(0.027)	(0.057)	(0.057)	(0.040)	(0.039)	(0.060)	(0.060)
High Risk	-0.354***	-0.342***	-0.537***	-0.519***	-0.358***	-0.348***	-0.479***	-0.450***
	(0.042)	(0.041)	(0.114)	(0.115)	(0.062)	(0.061)	(0.122)	(0.123)
Baseline No Risk								
The Year 2020 x Low Risk	0.013	0.007	0.019	0.013	0.012	0.007	0.017	0.011
	(0.0285)	(0.0283)	(0.0267)	(0.0264)	(0.0297)	(0.0293)	(0.0279)	(0.028)
The Year 2020 x Moderate Risk	0.016	0.012	0.023	0.019	0.018	0.013	0.022	0.017
	(0.026)	(0.025)	(0.023)	(0.023)	(0.027)	(0.026)	(0.025)	(0.024)
The Year 2020 x High Risk	0.016	0.014	0.022	0.019	0.035	0.033	0.037	0.035
	(0.030)	(0.030)	(0.027)	(0.028)	(0.038)	(0.038)	(0.036)	(0.037)
Density	-0.000004	-0.000003	0.000000	0.000001	0.00003	0.000037	0.000028	0.00003
	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00016)	(0.00014)	(0.00016)	(0.00014)
HDI	0.003	0.003*			0.002	0.002		
	(0.0017)	(0.0017)			(0.0028)	(0.0027)		
Mean Years of Schooling			0.043**	0.043**			0.031	0.028
			(0.020)	(0.020)			(0.022)	(0.022)
Unemployment Rate	-0.07	-0.056	-0.044	-0.029	-0.012	-0.032	-0.005	-0.021
	(0.251)	(0.254)	(0.251)	(0.253)	(0.302)	(0.302)	(0.298)	(0.297)
Municipality Dummy	0.168***	0.171***	0.132***	0.135***	0.170***	0.169***	0.144***	0.146***
	(0.006)	(0.006)	(0.017)	(0.017)	(0.013)	(0.012)	(0.021)	(0.021)
Number of Polling Stations	0.000016	0.00002	0.000016	0.00002	0.000024	0.00002	0.000025	0.00002
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00003)	(0.00003)	(0.00003)	(0.00003)
Incumbents Head-to-Head Dummy	-0.012	-0.014	-0.014	-0.015	-0.012	-0.012	-0.012	-0.013
	(0.0098)	(0.0098)	(0.0096)	(0.0096)	(0.0108)	(0.0108)	(0.0107)	(0.0107)
Coalition Gap	-0.0004**		-0.0004**		-0.0002		-0.0002	
	(0.0002)		(0.0002)		(0.0002)		(0.0002)	
Multiple Candidates Dummy		0.042***		0.043***		0.045**		0.043**
		(0.015)		(0.015)		(0.020)		(0.020)
Constant	0.888***	0.808***	0.912***	0.843***	0.887***	0.820***	0.922***	0.871***
	(0.078)	(0.076)	(0.045)	(0.046)	(0.125)	(0.124)	(0.050)	(0.051)
Observations	522	522	522	522	372	372	372	372
R-squared	0.919	0.92	0.921	0.922	0.912	0.915	0.913	0.916

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Source: Author's Calculations

in electoral processes. Despite this perception, empirical research has yielded varied and inconclusive results. This study seeks to bridge this gap by examining the impact of COVID-19 on political participation in the context of the 2020 Regional Elections in Indonesia. Through the application of robust statistical methods such as the Difference-in-Differences (DiD) approach, Propensity Score Matching (PSM)-DiD, and First-Difference regression, utilizing panel data from 2015 to 2020, we uncovered several notable findings diverging from previous studies conducted in other countries examining the effects of the COVID-19 pandemic and other infectious diseases on election turnout.

Initially, our investigation revealed a significant negative correlation between COVID-19 and voter turnout, particularly in regions with a surge in COVID-19 cases experiencing reduced turnout. However, despite this observed correlation, our study did not find robust evidence to establish a causal relationship between COVID-19 and decreased voter turnout. Moreover, the observed increase in turnout during the 2020 regional elections seems to be influenced by a temporal trend rather than the direct impact of COVID-19. Furthermore, we found that voter turnout was positively associated with regions featuring two or more competing candidates, suggesting that heightened competition may contribute to increased election turnout.

Our study challenges the notion that health risks inevitably deter political participation in the Indonesian context. Importantly, we highlight the relatively lower awareness of health risks among the Indonesian population, which could complicate mitigation efforts and the handling of COVID-19 and other potential disease outbreaks in the future. Further research is warranted to delve deeper into the complex interplay between health risks, political participation, societal factors, and clientelism, such as vote-buying, in shaping election turnout in Indonesia amidst the COVID-19 pandemic.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used ChatGPT and Grammarly to improve language and readability. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

Table 5. Regression Results Using PSM-First Difference Specification (Two Categories of COVID)

VARIABLES	(1) PSM-FD 1	(2) PSM-FD 2	(3) PSM-FD 3	(4) PSM-FD 4
Δ Time	0.0550***	0.0545***	0.0402***	0.0416***
	(0.0106)	(0.0108)	(0.0118)	(0.0123)
Δ COVID	0.00798	0.00872	0.00846	0.00905
	(0.0100)	(0.0100)	(0.0099)	(0.0099)
Δ Density	3.30e-05	3.81e-05	3.17e-05	3.65e-05
	(0.00011)	(9.44e-05)	(0.00011)	(9.78e-05)
Δ HDI	0.0023	0.0024		
	(0.0020)	(0.0019)		
Δ Mean Years of Schooling			0.0310**	0.0283*
			(0.0153)	(0.0152)
Δ Unemployment	-0.0126	-0.0293	-0.00771	-0.0209
	(0.211)	(0.210)	(0.208)	(0.207)
Δ Number of Polling Stations	2.37e-05	1.87e-05	2.53e-05	2.03e-05
	(2.19e-05)	(2.04e-05)	(2.17e-05)	(2.02e-05)
Δ Incumbents Head-to-Head Dummy	-0.0125*	-0.0131*	-0.0128*	-0.0134*
	(0.0074)	(0.0074)	(0.0073)	(0.0073)
Δ Coalition Gap	-0.00026*		-0.00025*	
	(0.00015)		(0.00015)	
Δ Multiple Candidates		0.0460***		0.0439***
		(0.0135)		(0.0134)
Constant	0.559***	0.504***	0.478***	0.454***
	(0.125)	(0.121)	(0.114)	(0.114)
Observations	372	372	372	372
R-squared	0.566	0.580	0.572	0.585
Number of Districts	186	186	186	186

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Source: Author's Calculations

References

Abad, L., & Maurer, N. (2021). Do pandemics shape elections? retrospective voting in the 1918 Spanish flu pandemic in the United States. *CEPR Discussion Paper, DP15678*. The Centre for Economic Policy Research. https://cepr.org/publications/dp15678.

Aldrich, J. H. (1993). Rational choice and turnout. *American Journal of Political Science, 371*(1), 246-278. doi: https://doi.org/10.2307/2111531.

Allard, T. (2021, June 3). *Exclusive Covid-19 far more widespread in Indonesia than official data show studies*. Reuters. https://www.reuters.com/world/asia-pacific/exclusive-covid-19-far-more-widespread-indonesia-than-official-data-show-studies-2021-06-03/. corona.

Baccini, L., Brodeur, A., & Weymouth, S. (2021). The COVID-19 pandemic and the 2020 US presidential election. *Journal of Population Economics, 34*, 739-767. doi: https://doi.org/10.1007/s00148-020-00820-3.

Bali, V. A. (2007). Terror and elections: Lessons from Spain. *Electoral Studies, 26*(3), 669-687. doi: https://doi.org/10.1016/j.electstud.2007.04.004.

Bellows, J., & Miguel, E. (2009). War and local collective action in Sierra Leone. *Journal of Public Economics, 93*(11-12), 1144-1157. doi: https://doi.org/10.1016/j.jpubeco.2009.07.012.

Bicu, I., & Wolf, P. (2020, September 30). *Going against the trend: Elections with increased voter turnout during the COVID-19 pandemic*. International IDEA (Institute for Democracy and Electoral Assistance). https://www.idea.int/news-media/news/going-against-trend-elections-increased-voter-turnout-during-covid-19-pandemic.

Bisnis.com. (2020, July 24). *Kualitas Pilkada 2020 diragukan, pengamat: rekrutmen calon buruk*. https://kabar24.bisnis.com/read/20200724/15/1270882/kualitas-pilkada-2020-diragukan-pengamat-rekrutmen-calon-buruk.

Blais, A. (2000). *To vote or not to vote?: The merits and limits of rational choice theory*. University of Pittsburgh Press.

Blais, A. (2006). What affects voter turnout?. *Annual Review of Political Science, 9*, 111-125. doi: https://doi.org/10.1146/annurev.polisci.9.070204.105121.

Blattman, C. (2009). From violence to voting: War and political participation in Uganda. *American Political Science Review, 103*(2), 231-247. doi: 10.1017/S0003055409090212.

Bodet, M. A., Thomas, M., & Tessier, C. (2016). Come hell or high water: An investigation of the effects of a natural disaster on a local election. *Electoral Studies, 43*, 85-94. doi: https://doi.org/10.1016/j.electstud.2016.06.003.

Bovan, K., Banai, B., & Banai, I. P. (2018). Do natural disasters affect voting behavior? Evidence from Croatian floods. *PLoS Currents*, 10. doi: 10.1371/currents.dis.cbf57c8ac3b239ba51ccc801d3362c07.

Campante, F. R., Depetris-Chauvin, E., & Durante, R. (2020). The virus of fear: The political impact of Ebola in the U.S. *NBER Working Paper, 26897*. National Bureau of Economic Research. https://www.nber.org/papers/w26897.

Chirwa, G. C., Dulani, B., Sithole, L., Chunga, J. J., Alfonso, W., & Tengatenga, J. (2022). Malawi at the crossroads: Does the fear of contracting COVID-19 affect the propensity to vote?. *The European Journal of Development Research, 34*, 409-431. doi: https://doi.org/10.1057/s41287-020-00353-1.

Downs, A. (1957). An economic theory of political action in a democracy. *Journal of Political Economy, 65*(2), 135-150. doi: https://doi.org/10.1086/257897.

Fernandez-Navia, T., Polo-Muro, E., & Tercero-Lucas, D. (2021). Too afraid to vote? The effects of COVID-19 on voting behaviour. *European Journal of Political Economy, 69*, 102012. doi: https://doi.org/10.1016/j.ejpoleco.2021.102012.

Gertler, P. J., Martinez, S., Premand, P., Rawlings, L. B., & Vermeersch, C. M. (2016). *Impact evaluation in practice* (2nd edition). Inter-American Development Bank & World Bank.

Gutiérrez, E., Meriläinen, J., & Rubli, A. (2022). Electoral repercussions of a pandemic: evidence from the 2009 H1N1 outbreak. *The Journal of Politics, 84*(4), 1899-1912. doi:

https://doi.org/10.1086/719634.

Harder, J., & Krosnick, J. A. (2008). Why do people vote? A psychological analysis of the causes of voter turnout. *Journal of Social Issues, 64*(3), 525-549. doi: https://doi.org/10.1111/j.1540-4560.2008.00576.x.

Harris, H., & Horst, S. J. (2016). A brief guide to decisions at each step of the propensity score matching process. *Practical Assessment, Research, and Evaluation, 21*(1), 4. doi: https://doi.org/10.7275/yq7r-4820.

Hicken, A., Aspinall, E., Weiss, M. L., & Muhtadi, B. (2022). Buying brokers: Electoral handouts beyond clientelism in a weak-party state. *World Politics, 74*(1), 77-120. doi: 10.1017/S0043887121000216.

Kirkland, C., & Wood, M. (2017). Legitimacy and legitimization in low turnout ballots. *Government and Opposition, 52*(3), 511-531. doi: 10.1017/gov.2015.36.

Kompas.com. (2020a, July 17). *Mereka lebih takut mati kelaparan daripada tertular Covid-19*. https://www.kompas.id/baca/ekonomi/2020/07/17/mereka-lebih-takut-mati-kelaparan-daripada-tertular-covid-19.

Kompas.com. (2020b, October 15). *Pilkada saat pandemi dinilai buruk bagi kualitas demokrasi dan calon pemimpin*. https://megapolitan.kompas.com/read/2020/10/15/13362061/pilkada-saat-pandemi-dinilai-buruk-bagi-kualitas-demokrasi-dan-calon.

Lijphart, A. (1997). Unequal participation: Democracy's unresolved dilemma presidential address, American Political Science Association, 1996. *American Political Science Review, 91*(1), 1-14. doi: 10.2307/2952255.

Mattila, M., Söderlund, P., Wass, H., & Rapeli, L. (2013). Healthy voting: The effect of self-reported health on turnout in 30 countries. *Electoral Studies, 32*(4), 886-891. doi: https://doi.org/10.1016/j.electstud.2013.07.010.

Merdeka.com. (2020, November 18). *Potensi jual beli suara akan meningkat di Pilkada 2020*. https://www.merdeka.com/politik/potensi-jual-beli-suara-akan-meningkat-di-pilkada-2020.html.

Montalvo, J. G. (2012). Re-examining the evidence on the electoral impact of terrorist attacks: The Spanish election of 2004. *Electoral Studies, 31*(1), 96-106. doi: https://doi.org/10.1016/j.electstud.2011.07.004.

Muhtadi, B. (2019). *Vote buying in Indonesia: The mechanics of electoral bribery*. Palgrave Macmillan.

Noury, A., François, A., Gergaud, O., & Garel, A. (2021). How does COVID-19 affect electoral participation? evidence from the French municipal elections. *PloS one, 16*(2), e0247026. doi: https://doi.org/10.1371/journal.pone.0247026.

Okenews. (2020, December 22). *SMRC: Rasa takut masyarakat tertular Covid-19 turun jadi 71%*. https://nasional.okezone.com/read/2020/12/22/337/2332130/smrc-rasa-takut-masyarakat-tertular-covid-19-turun-jadi-71.

Rapeli, L., Mattila, M., & Papageorgiou, A. (2020). Breaking a habit: The impact of health on turnout and party choice. *Party Politics, 26*(2), 133-142. doi: https://doi.org/10.1177/1354068817753060.

Reitan, T. C. (2003). Too sick to vote? Public health and voter turnout in Russia during the 1990s. *Communist and Post-Communist Studies, 36*(1), 49-68. doi: https://doi.org/10.1016/S0967-067X(02)00058-2.

Remmer, K. L. (2014). Exogenous shocks and democratic accountability: evidence from the Caribbean. *Comparative Political Studies, 47*(8), 1158-1185. doi: https://doi.org/10.1177/0010414013488563.

Robbins, J., Hunter, L., & Murray, G. R. (2013). Voters versus terrorists: Analyzing the effect of terrorist events on voter turnout. *Journal of Peace Research, 50*(4), 495-508. doi: https://doi.org/10.1177/0022343313479814.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41-55. doi: https://doi.org/10.1093/biomet/70.1.41.

Rosema, M. (2007). Low turnout: Threat to democracy or blessing in disguise? Consequences of citizens' varying tendencies to vote. *Electoral Studies, 26*(3), 612-623. doi: https://doi.org/10.1016/j.electstud.2006.10.007.

Rudolph, L., & Kuhn, P. M. (2018). Natural disasters and political participation: evidence from the 2002 and 2013 floods in Germany. *German Politics, 27*(1), 1-24. doi: https://doi.org/10.1080/09644008.2017.1287900.

Santana, A., Rama, J., & Bértoa, F. C. (2020). *The coronavirus pandemic and voter turnout: Addressing the impact of COVID-19 on electoral participation*. SocArXiv Papers. doi: https://doi.org/10.31235/osf.io/3d4ny.

Silmi, Z. I. (2021, April 19). *Satu tahun Covid-19 di Indonesia, waspadai pandemic fatigue!*. Kawal COVID-19. https://kawalcovid19.id/content/1904/satu-tahun-covid-19-di-indonesia-waspadai-pandemic-fatigue.

Sinclair, B., Hall, T. E., & Alvarez, R. M. (2011). Flooding the vote: Hurricane Katrina and voter participation in New Orleans. *American Politics Research, 39*(5), 921-957. doi: https://doi.org/10.1177/1532673X10386709.

Stockemer, D. (2015). Turnout in developed and developing countries: Are the two turnout functions different or the same?. *Political Science, 67*(1), 3-20. doi: https://doi.org/10.1177/0032318715585033.

Picchio, M., & Santolini, R. (2022). The COVID-19 pandemic's effects on voter turnout. *European Journal of Political Economy, 73*, 102161. doi: https://doi.org/10.1016/j.ejpoleco.2021.102161.

Tempo.co. (2021, January 7). *Covid-19 surge driven by year-end long holidays: task force*. https://en.tempo.co/read/1421074/covid-19-surge-driven-by-year-end-long-holidays-task-force.

The Jakarta Post. (2020, June 28). *Vote buying threatens to undermine year-end elections: KPK*. https://www.thejakartapost.com/news/2020/06/28/vote-buying-threatens-to-undermine-year-end-elections-kpk.html.

Urbatsch, R. (2017). Influenza and voter turnout. *Scandinavian Political Studies, 40*(1), 107-119. doi: https://doi.org/10.1111/1467-9477.12079.

Wooldridge, J. M. (2015). *Introductory econometrics: a modern approach* (6th edition). Cengage Learning.

Appendix

Appendix 1. Regression Results Using First Difference Specification (Four Categories of COVID)

VARIABLES	(1) PSM-FD 1	(2) PSM-FD 2	(3) PSM-FD 3	(4) PSM-FD 4
Δ Time	0.0443**	0.0416**	0.0256	0.0225
	(0.0182)	(0.0192)	(0.0194)	(0.0199)
Δ Low Risk	0.0124	0.0120	0.0166	0.0163
	(0.0207)	(0.0216)	(0.0195)	(0.0200)
Δ Moderate Risk	0.0176	0.0165	0.0219	0.0209
	(0.0187)	(0.0196)	(0.0171)	(0.0177)
Δ High Risk	0.0354	0.0393	0.0373	0.0411
	(0.0264)	(0.0277)	(0.0251)	(0.0260)
Δ Density	2.99e-05	2.14e-05	2.75e-05	1.97e-05
	(0.00011)	(0.00010)	(0.00011)	(0.00011)
Δ HDI	0.0023	0.0025		
	(0.0019)	(0.0019)		
Δ Mean Years of Schooling			0.0313**	0.0327**
			(0.0152)	(0.0152)
Δ Unemployment Rate	-0.0115	0.0082	-0.0046	0.0145
	(0.211)	(0.214)	(0.208)	(0.210)
Δ Number of Polling Stations	2.36e-05	2.65e-05	2.49e-05	2.75e-05
	(2.25e-05)	(2.22e-05)	(2.23e-05)	(2.20e-05)
Δ Incumbents Head-to-Head Dummy	-0.0120	-0.0124	-0.0124*	-0.0128*
	(0.0076)	(0.0076)	(0.0075)	(0.0075)
Δ Coalition Gap	-0.0002		-0.0002	
	(0.00015)		(0.00015)	
Δ Multiple Candidates Dummy		0.00014		0.00033
		(0.0031)		(0.0031)
Constant	0.561***	0.544***	0.477***	0.460***
	(0.124)	(0.122)	(0.113)	(0.115)
Observations	372	372	372	372
R-squared	0.568	0.561	0.574	0.568
Number of Districts	186	186	186	186

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Source: Author's Calculations

Gedung LPEM FEB UI
Jl. Salemba Raya No. 4, Jakarta 10430
Phone : +62-21 3143177 ext. 621/623;
Fax : +62-21 3907235/31934310
Web : http://www.lpem.org/category/publikasi/workingppers/