

Impact of Lockdown Policy During COVID-19 Pandemic on Intimate Partner Violence in Los Angeles

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Abstract. Covid-19 has impacted people's lives significantly, and it might continue to impact them until people find a way to deal with it indefinitely. In the early stage of the pandemic, when there was no vaccine and COVID-19 had an outbreak, the government decided to implement a lockdown policy to stop the spread. Several questions have arisen, whether lockdown affects intimate partner violence and how it will change after lockdown. This study examined intimate partner violence experienced by people during the COVID-19 lockdowns in Los Angeles. By selecting intimate partner violence data from 2019 to 2022 from Los Angeles crime dataset and using Difference-in-Difference method compare the intimate partner crime counts during different period, the following result is generated. The study shows that intimate partner violence will drop significantly at the beginning of the lockdown and increase as lockdown time increases. Intimate partner violence also increases when the lockdown is over. This study could be used for future policy making and preventing intimate partner violence in case another pandemic outbreak requires lockdown.

Keywords: Intimate Partner Violence; Covid-19; Lockdown; Los Angeles; Difference-in-differenced.

1. Introduction

The coronavirus pandemic is one of the most significant events in recent years that has impacted people's lives globally and will keep impacting people's lives from different perspectives until people find a way to deal with it indefinitely. Covid-19 causes not only irreversible damage to people's respiratory system but also has unforeseen sequelae in the long term. The contagiousness of coronavirus makes it almost unstoppable at the beginning without a vaccine and cause thousands of people's death. In order to fight the rapid spread of coronavirus, different country has taken different precautions to help prevent the spread of the disease. For the years 2020 and 2021, people in most countries have experienced some form of restriction such as lockdown, quarantine or wearing a mask, place like China are still having lockdown and quarantine police now. For the United States, the local government has published lockdown policies regionally [1]. Although these preventive actions help reduce the spread of Covid-19, they damage the economy worldwide and alter people's lives in unprecedented ways. People lose their jobs and maybe mentally stressed for many reasons [2]. Negative feelings like anger may be generated due to separation from family and friends, restraining people, which makes them feel lose freedom [3]. People also experience fear of whether they are infected by Covid-19 or anxiety about the sequelae of coronavirus if they already had Covid-19.

These increments in unemployment and emotional change could alter the crime rate. The correlation between mental health and crime rate may not be a simple causal effect. Instead, people's actions to deal with stress, like drinking alcohol, could directly or indirectly increase the chance of crime [4]. Moreover, during the lockdown, most bars and restaurants were closed, and the chance of people with violent issues committing domestic violence after consuming alcohol increased [4]. Based on research conducted by Piquero et al., the incidence of domestic violence increased during the lockdown [2]. One research using an indirect methodology (survey) conducted in Peru also suggests that during the lockdown, there was an 8.3% increase in domestic violence for samples they collected, and for those who experienced domestic violence before the increase, even more, about 22.5% [5]. The data suggest that lockdown not only increases the likelihood of non-violence people

committing domestic violence but also encourages the family offender to do secondary damage to their victim.

However, as mentioned in the paper of Esposito & King, not all crime increased during the lockdown [4]. In New York, crimes like felony assault and housing crimes decreased, and different regions' crime rates may be impacted differently by the lockdown policy. For instance, the incidence of domestic violence in New Orleans decreases at the beginning of the stage and then increases after the early stage. Different regions also have their own condition and thus varied differently. By comparing over 37,000 unique records from 2019 to 2020 in China, Dai et al. discovered that during the lockdown, although domestic violence significantly increased, the dispute cases decreased [6]. The previous study by Mohler et al. showed that there was a significant increase in domestic violence in Los Angeles from January to April 2020 [7]. Mohler et al. also showed that although there was a significant increase in domestic violence during that period, the domestic violence involving aggravated assaults has not shown significant change [7].

While most studies focus on how the early state of lockdown or Covid-19 impacted the domestic crime rate, only a few have long-term data, and almost none of them studied how the domestic violence rate varied after the lockdown. Also, as mentioned before, different data source could lead to different conclusion. This study is an extension of Mohler's paper, which aims to study how intimate partner violence is impacted by the lockdown policy published on March 18, 2020, and how it will change after lockdown in Los Angeles. Organization of the Text

2. Method

2.1 Data Sources

The crime data was retrieved from the open data portal of Los Angeles city LOS ANGELES OPEN DATA (data.lacity.org). The data mainly comes from two datasets. Both datasets were built on data provided by Los Angeles Police Department. The first dataset used is Crime Data from 2020 to the Present, which records crime incidents in the City of Los Angeles from January 2020 to August 2022. The second dataset used is Crime Data from 2010 to 2019. These two datasets combined contain over two million records and 28 attributes in each record.

2.2 Data Preprocessing

Since the data is enormously large and contains complicated attributes that are not useful for this study which is to identify the lockdown effect on intimate partner violence, the data is screened and processed from different aspects, which are described below:

1) For research purposes, only data from recent years was selected, from 2019 to 2022. Then these data were sorted chronically from the oldest to the newest on the date crime happened instead of the day it was reported. In this way, the data more accurately describes the frequency of crime daily.

2) By their crime type, only crime that involved intimate partner violence was retrieved by excel power query and created a new dataset. Crime codes 626 and 236, which corresponded to intimate partner-simple assault and intimate partner-aggravated assault, were considered the most common domestic violence crime happened in Los Angeles. Based on the Domestic Violence Calls from 2020 to Present dataset built on the Los Angeles Police Department data, the total number of intimate partner-simple assault and intimate partner-aggravated assault incidents that happened in the past two years are 27,536 and 7669. Other related domestic violence calls are less than 1500 cases. Also, other crimes documented in the Domestic Violence Calls from 2020 to Present dataset are a violation of restraining order, robbery, and more which are not typical intimate partner violence that this paper focused on and may create noise to the result.

3) To examine how quarantine and lockdown affect domestic crime in Los Angeles, the total number of daily intimate partner violence happened in Los Angeles was calculated and selected as an indicator. Also, the number of daily intimate partner-simple assaults and daily intimate partner-

aggravated assaults in Los Angeles were calculated separately. These three datasets contain 1315 samples each, and some obvious outliers like data of 2020.1.1 were later removed in analysis.

2.3 Variable explanation

2.3.1 Dependent variable

The dependent variable for three datasets is same which is the total number of intimate partner violence daily, total number of simple intimate partner violence, and depending on different research purpose.

2.3.2 Independent variable

The treatment variable is lockdown for analyzing the lockdown effect, a dummy variable that takes the value of 1 for data after Mar. 18 2020 and before June 15 2021. The rest datapoints takes value of 0. For analyzing the change after lockdown restriction lifted, the treatment variable is post-lockdown which is a dummy variable that takes the value of 1 for data after June 15 2021. The dummy indicator that equals zero for the rest of the datapoints.

2.4 Identification strategy

The difference-in-difference technique was adopted to capture the impact of lockdown policy and change after the lockdown ended. The study conducted by Perez-Vincent et al. also uses this technique [8]. Compared to intervention analysis, the difference-in-difference model better addressed seasonality. The regression equation for this model would be $Y = \beta_0 + \beta_1 * [Time] + \beta_2 * [Intervention] + \beta_3 * [Time * Intervention] + \beta_4 * [Covariates] + \epsilon$. Intervention is lockdown or lockdown is over depending on different research purposes.

3. Results and Discussion

To research the impact of the lockdown policy, the treatment group will be data on total intimate partner violence from 2020, and the same period of the previous year will be selected as the control group. Since the lockdown policy started on March 18, 2020, and ended on June 15, 2021, the data after March 18 in both the control group and treatment group are considered treated, which means it is affected by the lockdown policy. Additionally, dataset of intimate partner violence. Similarly, to study change after the lockdown restraining order is lifted, data from March 18, 2020, to December 31, 2020, and data from March 18, 2021, to December 31, 2021 was selected as the control group and treatment group correspondingly. The treatment period is from June 15 to December 31, 2021, and June 15 to December 31, 2020.

The treatment period is also varied in length in order to study whether the length of lockdown affects the number of incidences of intimate partner violence.

3.1 Impact of lockdown policy on intimate partner violence

Table 1. Impact of lockdown policy on number of IPV

	Coefficient	p-value
Intimate partner violence	-4.568	0.005305
Intimate partner violence-Simple assault	-3.42	0.01406
Intimate partner violence-Aggravated assault	-1.277	0.0275

As Table 1, the treatment effect of lockdown is -4.56 for total number of intimate partner violence, which means that after the California government published the lockdown policy on March 18, 2020, there was a significant decrease in intimate partner violence happening every day during the lockdown period. Presumably, one main reason this phenomenon could happen in Los Angeles is that

L people stay home longer during the pandemic, and work is becoming remote because of the lockdown, which means they spend more time with their partners. During the lockdown period, unintentionally, people could solve the two most common reasons that lead to the argument in the relationship: lack of communication and not getting enough time together. The lockdown policy might also reduce the chance of people having an affair or cheating in a relationship. A study has shown that romantic jealousy could result in losing trust in their partner, disputes, and controlling behaviors. Ultimately, jealousy or infidelity suspicion could lead to physical and emotional intimate partner violence [9].

Buunk & Fernandez mentioned three types of jealousy [10]. Reactive jealousy is when their partner engages in sexual behavior with a third person; Anxious jealousy is when people worry about their partner being unfaithful in the relationship; preventive jealousy is worried when their partner contacts opposite-sex people. Since now people spend most of their time at home and their partner will have the information about where they are and what they are doing, the three types of jealousy mentioned before should be mitigated. People during lockdown have a smaller chance of meeting an opposite-sex stranger. Even if they do, they are unlikely to spend time with them in person since all the restaurants do not accept dine-in and all the other entertaining places like the cinema are closed because of the restriction. During the lockdown, people cannot find a place to date or form bonds. Ideally, Los Angeles couples during the Covid-19 lockdown could restore trust, reduce jealousy and arguments in the relationship, and thus decrease intimate partner violence during the lockdown period.

However, it also could be caused by people who suffered from intimate partner violence who could not report the crime to the police. Before the pandemic, domestic violence was one of the least reported crimes, with about half of the crimes unreported [7]. Things could even get worse during the lockdown, where the victim report rate may be even lower since they may not be able to report crimes as they did before Covid-19. Before the coronavirus, the victim may be able to keep a distance from the offender by avoiding coming home, but victims now have to spend most of the time at home with the offender. The victim’s communication device may be taken, and their safety is guaranteed. Thus, they have fewer opportunities to report [4].

The table 1 shows that intimate partner-simple assault is more influenced by lockdown policy in number. However, when considering the base of intimate partner-aggravated assault is relatively small, the proportion of intimate partner-aggravated assault has greater change.

3.2 Change on intimate partner violence after lockdown is over

Table 2. Number of intimate partner violence happened in Los Angeles for 2019,2020,2021

	Coefficient	p-value
Intimate partner violence	2.997	0.05794

Table 3. Change in number of IPV after restriction is lifted

Year	Sum of IPV case between June.15 and end of the year
2019	8281
2020	7320
2021	7780

As Table 2 shows, the treatment effect is 2.99, which means that after the California government dropped the pandemic restriction on June 15, 2021, there was a statistically significant increase in intimate partner violence happening every day after the restriction was lifted. It could be an indication that as more people get vaccinated, people’s lifestyle is back to normal, and the daily number of intimate partner violence are also returning to the level before covid-19. Table 3 is calculated based on the number of intimate partner crimes after the restriction was lifted in 2021 and the number of intimate partner crimes in the same time period but in a different year. It shows that people committed

fewer intimate partner violence in 2020 compared to 2021. Also, it indicates that the case of IPV in 2021 is getting closer to the number of IPV in 2019. The potential reason for this phenomenon could be the counterargument of why the number of intimate partner violence drops during the lockdown. Now, after the lockdown period, people have more in-person interactions that could trigger their partner’s jealousy. Unlike during the lockdown period, these couples stay less at home, and entertaining places reopen, which could increase the probability of infidelity. The communication between each romantic partner is also reduced since they spend less time together compared to time spent during the lockdown period.

3.3 Different length of lockdown impact on intimate partner violence

Table 4. Impact of lockdown policy for different length after implemented in Los Angeles

After implemented lockdown policy	Impact on number of IPV	p-value
3-month	-4.153	0.0276
6-month	-5.266	0.00259
9-month	-4.568	0.005305
12-month	-4.228	0.00756

Table 4 is calculated using the same method that used in section 3.1, March 18, which is the date Los Angeles started the lockdown as the turning point. Then, the interaction term, which is the lockdown impact, is calculated for different lengths of time after the lockdown. The result in Table 4 shows that for the first six months, there was a considerable reduction in the impact on the number of intimate partner violence incidents in Los Angeles compared to the first three months when the lockdown policy was published. Then the number increased as the time of policy adopted increased. The significant reduction in the six months after lockdown compared to 3 months after lockdown implies that for the time between 3-6 months after lockdown, there is a considerable decrease in the number of intimate partner violence happen. The potential reason for the decrement might be because with more communication and more time together, and people are getting along with each other for the first six months. Then, the number of intimate partner violence decreased for the first half year after the policy was implemented.

The result for nine months and twelve months has increased, implying that there might be a linearly increasing trend in the number of intimate partner violence happens as the lockdown policy time gets longer. Many reasons could cause the increase. For instance, as COVID-19 last longer, people are more worried about the future, and anxiety could lead to intimate partner violence. Other common reasons are lack of social interaction and being away from friends and family, which could lead to negative feelings such as anger and potentially cause intimate partner violence. Moreover, the restriction may irritate people as the lockdown time is prolonged, and unemployment or a reduction in pay could also be a stimulus for an intimate partner. Thus, as lockdown time increase, the impact of reducing intimate crime might be decreased.

4. Robustness Analysis

Table 5. The calculated impact of lockdown policy using year 2022 as control group

	Coefficient	p-value
Intimate partner violence	-4.28	0.0129

To test the robustness of the result, the control group is switched to 2022, and other data remain the same. The reason for using 2022 is that it considers the potential COVID-19 effect, but there is no lockdown during 2022, and people’s lives are ordinary. The data after March 18, when Los Angeles started the lockdown, are still considered as treated. The result in Table 5 shows that the impact of the lockdown is -4.28. Compared to the result shown in Table 1, which is -4.568, the result

is similar to each other. Thus, the lockdown policy decreased the number of intimate partner violence cases in Los Angeles.

5. Research Limitation

Some of the research limitations of this paper are, firstly, the data is transcribed from original paper crime reports, and there might be data inaccuracies caused by reasons like mistyping or reports not transcribed. Like mentioned in previous section, domestic violence was one of the least reported crimes before Covid-19, with about half of the crimes unreported [7]. The victim report rate could decrease since during lockdown they may have fewer opportunities to report crimes as they stay close to the offender all the time [4]. Thus, the data generated based on the case number maybe inaccurate.

Also, the data used in this research was only gathered from Los Angeles, and as mentioned before, the different regions may be impacted by lockdown policy differently. The conclusion may only work for the Los Angeles region.

There is also selection bias that maybe not all intimate partner violence is categorized into intimate partner-simple assault and intimate partner-aggravated assault. This is a natural experiment, and due to the nature of domestic violence, many factors could affect the daily intimate partner violence count. It is uncertain if the change is solely based on lockdown policy.

6. Summary

By analyzing the intimate partner violence data in Los Angeles from 2019 to 2021 using difference-in-difference method, the result indicates that lockdown reduce the intimate partner violence unlike most people predicted. There are abundant reason for this to happen. Los Angeles couples could live more harmoniously because they spend more time together. Fewer quarrels and jealousy, lead to less probability that intimate partner violence happens. However, the Los Angeles government should pay more attention to domestic violence and set up emergency shelter, transitional housing and other methods help victim since there is a chance the conclusion is draw because the people during lockdown are unable to report the intimate partner violence crime. If the epidemic spread again and another lockdown is required, the Los Angeles government should ensure domestic violence victim's safety and prevent victims' secondary victimization by giving them a place to hide from the offender and a method to report the crime immediately. Moreover, the Los Angeles government should encourage people to report crime once they encounter domestic violence, no matter if it is the first time.

The study also shows as the lockdown restriction is lifted, the number of intimate partner violence return to its original level. The government should pay more attention to intimate partner violence and take preventive action against previous domestic violence offenders. The result also shows that intimate partner violence will start to increase as the lockdown period increases, and there is a considerable decrease at the beginning of the lockdown. The government should try to keep the lockdown period shorter. Also, the government should take into consideration that there will increment in intimate partner violence during the late lockdown period and prepare.

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