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Collaterals of COVID-19: The Effects of Lockdowns on Domestic Violence

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The novel coronavirus (COVID-19) was first detected in Wuhan, China in December of 2019 and was first documented in the United States approximately one month later, with the first case being reported on January 21, 2020. Since then, the virus has spread throughout the country and throughout the globe at rapid rates, infecting approximately 250,000,000 people globally to date and approximately 46,000,000 in the United States alone. The U.S. comprises approximately 18% of the world's confirmed cases and about 15% of the world's confirmed deaths, despite making up only about 4.25% of the world's population (John Hopkins University, 2021). The effects of the global pandemic have been far reaching and extend beyond the evident health-related issues. In an effort to mitigate the spread of the virus, government officials enforced stay-at-home orders, mandating that individuals refrain from interacting in large groups and do not engage with anyone outside of their household unless for extenuating circumstances. In response to these orders, most businesses and schools shut down, increasing the time that individuals spent at home with their families and partners. While these efforts helped in reducing the spread of the coronavirus, they were met with detrimental impacts on society that can lead to long lasting financial, social, and psychological effects. Loss of jobs can lead to increased levels of stress and strain, and social isolation can limit one's access to support systems. These issues are especially cumbersome for those who experience domestic violence in the home.

Several weeks after lockdowns began, on April 5, 2020, the issue of domestic violence was addressed by the United Nations Secretary. He stated that despite the fact that we know that "lockdowns and quarantines are essential to suppressing COVID-19...they can trap women with abusive partners... Over the past weeks, as the economic and social pressures and fear have grown, we have seen a horrifying surge in domestic violence." As part of these remarks, the UN Secretary also called for nations to develop and adopt plans to combat the increase in domestic violence to be included in their overall plan of response to COVID-19. He suggested that domestic violence shelters remain open as essential services and that we set up emergency warning systems in locations that individuals were still frequenting such as pharmacies and grocery stores; this was especially important considering victims no longer had access to many of the mandatory reporters such as doctors and schoolteachers.

Given this issue, the aim of the current study is to examine the effects of the COVID-19 lockdown on domestic violence in a large U.S city: Dallas, Texas. For the city of Dallas, domestic violence was defined as abuse or assault against a family member, household member (including previous household members), or a current or past dating partner.

Theory and Prior Research

There are two primary theoretical reasons to expect changes in domestic violence following lockdown orders. First, General Strain Theory (GST; Agnew, 1992) would suggest that the increase in strain resulting from social isolation and potential loss of jobs can increase negative emotions such as anger; this, coupled with a lack of access to some prosocial coping mechanisms such as going to the gym or socializing with friends, can lead to an increase in antisocial coping and result in more violence in the home. Second, Routine Activities Theory (RAT) offers greater understanding on risks to potential victims. According to RAT, crime occurs when three conditions are met: the presence of a motivated offenders, a suitable target exists, and there is an absence of a suitable guardian (Cohen & Felson, 1979). Therefore, if potential victims are stuck at home with domestic violence perpetrators, and have no access to guardians, an increase in domestic violence will occur.

Since the early months of the pandemic, researchers have begun to evaluate the effects of lockdowns and quarantine measures on domestic violence. Meta-analysis work based on 37 completed studies evaluating these effects determined an average of a 7.86% increase in domestic violence as a result of lockdown responses to COVID-19 (Piquero et al., 2021). When evaluating only U.S. based studies, this number is slightly higher, with results demonstrating an overall increase of 8.10%. The Rape, Abuse and Incest National Network (RAINN) documented a 22% increase in calls during March of 2020 (Kamenetz, 2020). According to RAINN, this was the first time that more than half of their calls came from minors; additionally, most reported that they were being victimized by a family member (67%) and that they were currently living with that individual (79%). These numbers illustrate significant changes in domestic violence that warrant further investigation.

Within Texas specifically, there have been several case studies and stories published by the media regarding the potential rise in domestic violence. In 2020, local news stations presented stories about rises in child abuse in Fort Worth (Solis & Martinez, 2020) as well as increases in domestic violence, assault, and burglary in Houston (CW39, 2020). Additionally, there were reported increases in domestic violence in Montgomery County (Gonzales, 2020) and other researchers discovered increases in Google-based searches for domestic violence help (Neuman, 2020; Townsend, 2020).

Current Focus

The current study aimed to overcome the case-based media reporting and evaluate trends in domestic violence, assessing for change as a result of the stay-at-home orders. Using data from the Dallas Police Department, the current study provides a short-term examination of how lockdowns as a response to the pandemic affected domestic violence in the city of Dallas.

Methodology

The current study uses data from the city of Dallas, Texas. Dallas is one of the largest and most populated cities in the state, with a population of approximately 1,300,000 persons as of July 1, 2019, making it one of the country's ten largest cities. The Dallas Police Department (DPD) has over 3,500 sworn officers and

over 500 civilian employees. The DPD oversees public safety for the city and requires all officers to enter all reports into the report management system (RMS). Any call that officers receive or activity that they initiate themselves, such as a traffic stop, creates an incident number. If the incident results in a situation where a report must be completed, officers log into the DPD field-based reporting system and complete their report. Each report requires officers to answer domestic-violence related questions before submitting; specifically, officers are required to indicate if the incident was a domestic violence-related report. Once the report is complete, it can be accessed and extracted in the report management system. Daily, crime analysts extract this data and create descriptive analyses for command staff members. One type of report that they create is the Family Violence Incident List, which is used in this study. Included in this list are the following: child abuse, elderly abuse, sexual assault offenses, as well as misdemeanor and felony domestic violence. Child abuse includes indecency with a child (child is a person under 17 years old) and sexual assault of a child. Elderly abuse involves a crime committed against someone who is 65 or older. Sexual assaults are those offenses committed against adults. Misdemeanor domestic violence includes harassment, interference with 911 calls, deadly conduct, arrest warrant arrests, and unlawful restraint. Felony domestic violence includes aggravated assault, strangulation offenses, and violations of protective orders.

The current project uses domestic violence incident reports that occurred between January 1st, 2020 and April 27th, 2020. There were a total of 118 days of incident counts. All incidents were summed together to create an index of daily counts of domestic violence, which serves as the dependent variable in the study. Table 1 presents the descriptive statistics for total domestic violence and individual categories.

Analytic Plan

The city of Dallas implemented stay-at-home orders on March 24th, 2020. An indicator variable was created to represent the lockdown intervention. The 83 days before then (January 1st to March 23rd) were coded as zero and the 35-day post-intervention period (March 24th to April 27th) were coded as one. Multiple approaches to evaluate the effects of the stay-at-home orders were then implemented. First, the analysis began with a descriptive graph demonstrated domestic violence crime counts for all the data and work a 6-week window surrounding the intervention date. Second, a trend analysis was implemented to detect effects of the stay-at-home order on the daily time series. The test used estimates linear trends in domestic violence before the intervention (lockdown) took place, determines changes in domestic violence once the intervention began, and estimates the linear trend of domestic violence after the intervention. Third, a Dickey-Fuller test and a correlogram plot were used for non-stationarity and to assess if lagged values were autocorrelated with domestic violence data. Fourth, OLS and Poisson regression models that include the lag terms that are autocorrelated with the data series were used. The final step was an autoregressive integrated moving average (ARIMA) forecast model. This model used data from before the lockdown was implemented to predict future domestic violence incidents; prediction intervals were generated and used as comparison to actual domestic violence incidents that occurred after lockdowns.

Results

Results from the current analyses indicate changes in domestic violence as a result of the COVID-19 pandemic and ensuing lockdowns. An index of daily counts for domestic violence incident reports for the 118 days between January 1st, 2020 and April 27th, 2020 were created by summing together misdemeanor, felony, child, elderly, and sexual assault family

violence incidents. Descriptive statistics for total domestic violence and for individual categories is displayed in Table 1.

Table 1. Descriptive Statistics

Crime Type	Mean	Std. Dev.	Min	Max
Domestic Violence	36.38	8.26	17	62
Misdemeanor	24.62	6.25	10	45
Felony	10.49	3.59	2	19
Elderly	0.37	0.57	0	3
Child	0.56	0.83	0	4
Sexual Assault	0.28	0.54	0	2

The graphs in Figure 1 depict a visual representation of the entire time series as well as the restricted 6 week time period for domestic violence incidents. In it, the domestic violence incidents are the solid black line, and the dashed vertical line indicates the beginning of the lockdowns in Dallas on March 24th, 2020.

Figure 1. Dallas Domestic Violence Incidents
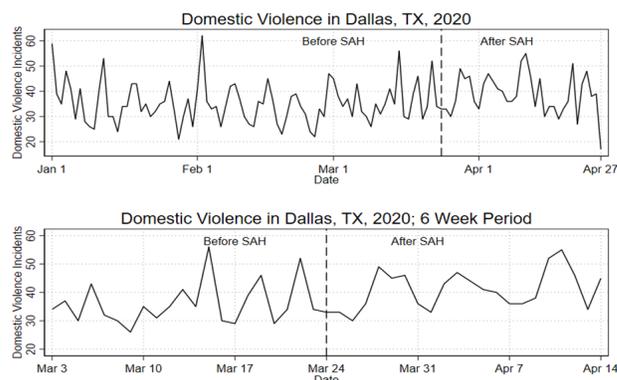
Trend analysis was set up using the Statistical Analysis System (SAS) date format which presents dates as the number of days since January 1st, 1960 (for example, January 2nd, 1960 is 00001). Figure 2 graphically depicts the estimated linear models for domestic violence before and after the lockdowns were implemented. Additionally, results for the trend analysis are presented in Table 2.

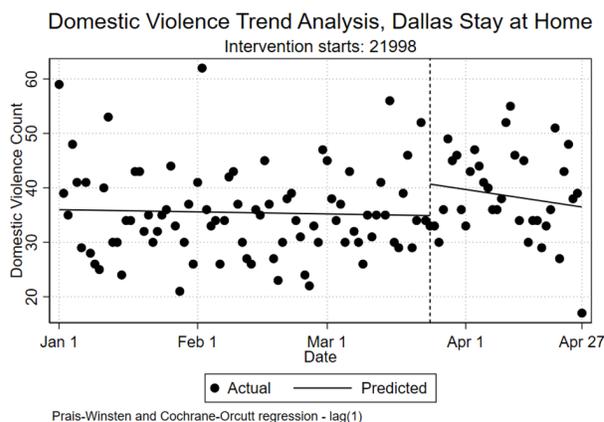*Figure 2. Trent Analysis, March 24th Breakpoint*

Table 2 demonstrates that there is no statistically significant increase in domestic violence incidents immediately following the stay-at-home order on March 24th. However, when considering any additional potential changes in domestic violence that can be visually observed in Figures 1 and 2, then a second break in the trend two weeks after the stay-at-home orders went into effect (April 7th, 2020) can be estimated. Figure 3 visually demonstrates this two break point estimation. The results of the two break point trend analysis demonstrated two changes in domestic violence: an increase after March 24th (first dashed line) and a decrease after April 7th (second dashed line).

Table 2. Trend Analysis , March 24th and April 27th Breakpoints

|	Dependent Variable: Domestic Violence		
One Break Point	Coefficient	Std Error	P-value
Time before stay at home	-0.01	0.05	0.81
Start of stay at home order (March 24th)	5.78	3.69	0.12
Time during stay at home	-0.11	0.19	0.56
Constant	35.99**	2.59	0.00
Two Break Points			
Time before stay at home	-0.01	0.05	0.79
Start of stay at home order (March 24th)	0.36	3.43	0.92
Time between March 24th & April 7th	0.71*	0.29	0.02
Start of second week after (April 7th)	-2.49	4.46	0.58
Time after April 7th	-1.15*	0.51	0.03
Constant	36.02**	2.58	0.00
Note: *p-value < .05; **p-value < .01			
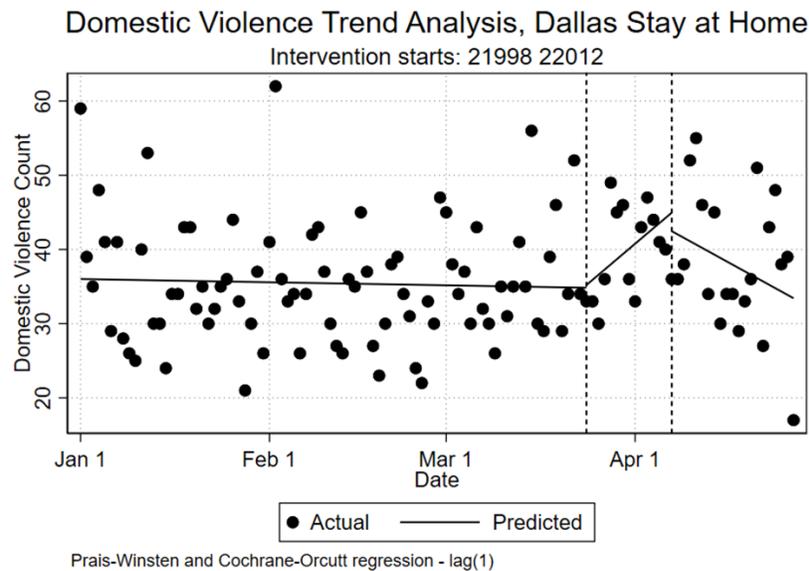
Figure 3. Trend Analysis, March 24th and April 27th Breakpoints

Ensuing results from the Dicker-Fuller test in Table 3 demonstrate that the domestic violence series is stationary. However, the autocorrelation plot in Figure 4 suggests the potential for some seasonality in the data. Here, the first, seventh, and fourteenth lag of domestic violence counts demonstrate potential effects on future values, presenting the possibility that those past values in the series could be strong predictors of respective future values.

Table 3. Dickey-Fuller Test Results

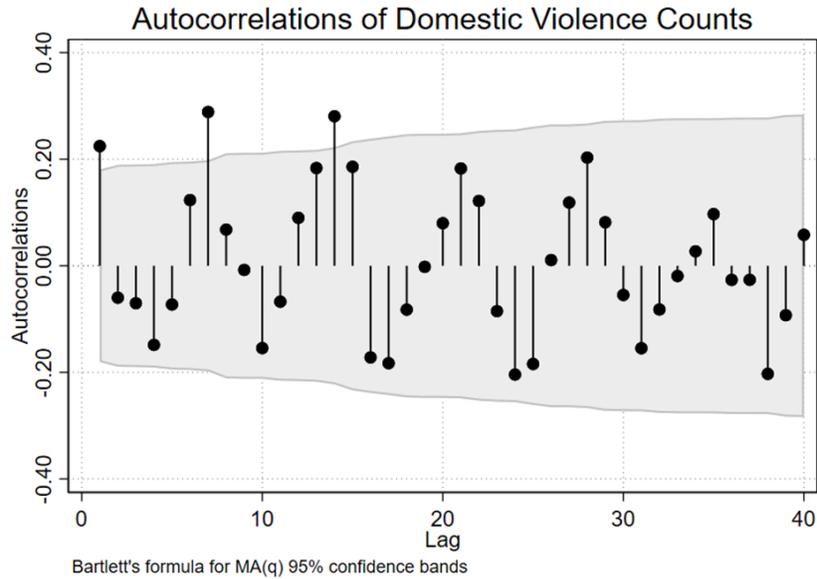|	Test Statistic	MacKinnon p-value
Domestic Violence	-8.51	0.00
Critical Values: 1% = -3.504; 5% = -2.889; 10% = -2.579		
Number of Observations: 117		

Figure 4. Autocorrelation Plot

Table 4 presents the results from the regression analyses and provides support for the notion that domestic violence increase in the days after the stay-at-home order went into effect. Model 1 demonstrates that days after the lockdowns took effect had an estimated 3.4 more domestic violence incidents. Model 2 and 3 demonstrate that the stay-at-home order is statistically significant at the 0.10 level, but this is not the case in Model 4. It seems that the strength of the relationship between the stay-at-home order and the domestic violence series is reduced when accounting for the effect of lagged values. Additionally, the Poisson regression models are affected differently when modeling the lagged dependent variable. Models 5-8 demonstrate that the lockdown order remains statistically significant at the 0.05 level. These coefficients can be interpreted as the change we expect to see in the difference in the natural log of expected domestic violence counts. Even when accounting for potential seasonality, the results of Model 6-8 demonstrate that the potential for a 7.1 to 8.4 percent increase in domestic violence counts in the days after the stay-at-home orders took place.

Table 4. OLS and Poisson Regression Results

	Dependent Variable: Domestic Violence			
OLS Regression Models	Coefficient	Std Error	P-value	Sig
	Shelter in place order	3.40	1.64	0.04	**
Model 1 Constant	35.37	0.89	0.00	***
R-squared = 0.356; (n=118)				
First lag(DV)	0.20	0.09	0.03	**
Model 2 Shelter in place order	2.91	1.60	0.07	*
Constant	28.01	3.34	0.00	***
R-squared = 0.0834; (n=117)				
Seventh lag(DV)	0.29	0.09	0.00	***
Model 3 Shelter in place order	2.95	1.59	0.07	*
Constant	24.67	3.37	0.00	***
R-squared = 0.1307; (n=111)				
Fourteenth lag(DV)	0.29	0.09	0.00	***
Model 4 Shelter in place order	2.54	1.61	0.12	
Constant	24.99	3.38	0.00	***
R-squared = 0.1320; (n=104)				

Table 4. OLS and Poisson Regression Results (cont.)

Poisson Regression Models					
Model 5	Shelter in Place Order	0.092*	0.03	0.01	***
	Constant	3.566*	0.02	0.00	***
	Pseudo R-squared = 0.0090; (n=118)				
Model 6	First lag(DV)	0.01	0.00	0.01	***
	Shelter in place order	0.08	0.03	0.02	**
	Constant	3.36	0.07	0.00	***
	Pseudo R-squared = 0.0204; (n=117)				
Model 7	Seventh lag(DV)	0.01	0.00	0.00	***
	Shelter in place order	0.08	0.03	0.02	**
	Constant	3.27	0.07	0.00	***
	Pseudo R-squared = 0.0324; (n=111)				
Model 8	Fourteenth lag(DV)	0.01	0.00	0.00	***
	Shelter in place order	0.07	0.04	0.05	**
	Constant	3.28	0.07	0.00	***
	Pseudo R-squared = 0.0318; (n=104)				
Note: *p-value < .10; **p-value < .05; ***p-value < .01					

Figure 5 presents the results of the ARIMA forecast model. An ARIMA model was fit to the data from the 83 days prior to the stay-at-home orders and then generated a predicted domestic violence count and two prediction intervals for the remaining 35 days. The 80 and 95 percent prediction intervals present the range of values of domestic violence counts that would be expected 80 or 95 percent of the time based on the data prior to March 24th. Of most concern is observed crime counts reaching above the predicted intervals, which indicate a spike in crime counts that go beyond what would be expected 95% of the time. In Figure 5, observed crime data is the solid black line, and the dashed black line represents the forecasted point estimate for domestic violence. The dark grey polygon is the 80% prediction interval and the light grey polygon is the 95% prediction interval. The dotted black line at March 24th represents the beginning of the stay-at-home intervention.

In the first week following the stay-at-home orders, the series peaks above the 80 percent prediction interval for three days and peaks above the 95 percent interval two weeks later. It rises again above the 80 percent interval in the last week demonstrated. Overall, only one day (2.8 percent) rises above the 95 percent prediction interval's upper limit. This suggests that the movement in domestic violence could have been predicted before the stay-at-home order went in to place and that any upward trend might be part of an already upward moving average.

Figure 5. Domestic Violence Project

Domestic Violence Projection in Dallas, TX
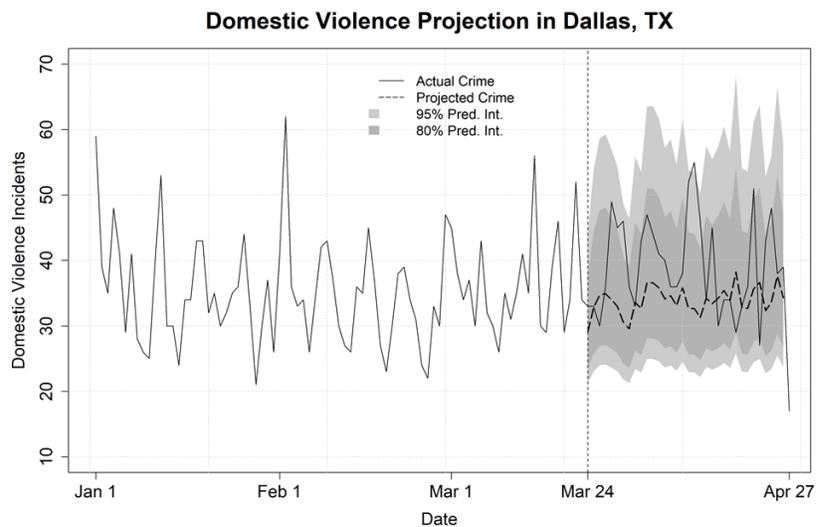
Conclusion

       At the start of the pandemic, COVID-19 resulted in massive societal change that seemed to have had several collateral consequences. One such consequence was crime, and this study focused primarily on one crime in particular: domestic violence. The study examined how lockdowns or stay-at-home orders effected domestic violence in one major U.S. city, Dallas, Texas. Initially, results did not demonstrate strong evidence of any changes in domestic violence. However, further analyses of the time series showed that there appeared to be an upward trend in domestic violence incidents in the first two weeks following the implementation of the lockdowns, with a decrease thereafter. However, some of that spike might have been attributed to an already-existing upward moving trend prior to the adoption of stay-at-home orders. This leads the researcher to cautiously interpret the regression models, and to underscore the need for more long-term, updated data. The current results demonstrate that domestic violence incidents did increase following March 24th, but do not provide strong evidence that this increase can be directly and solely tied to the stay-at-home order. Instead, the finding of a short term increase following March 24th could be due to the fact that people were already deciding to stay home prior to the official adoption of the lockdown policy. In fact, Google's community mobility maps demonstrated in Figure 6 show that people were already beginning to make changes in the places they frequented before March 24th, likely due to the CDC guidelines that were already in place.

Figure 6. Google Mobility Patterns, Dallas County, Dallas, Texas. February 29, 2020 – April 11, 2020.
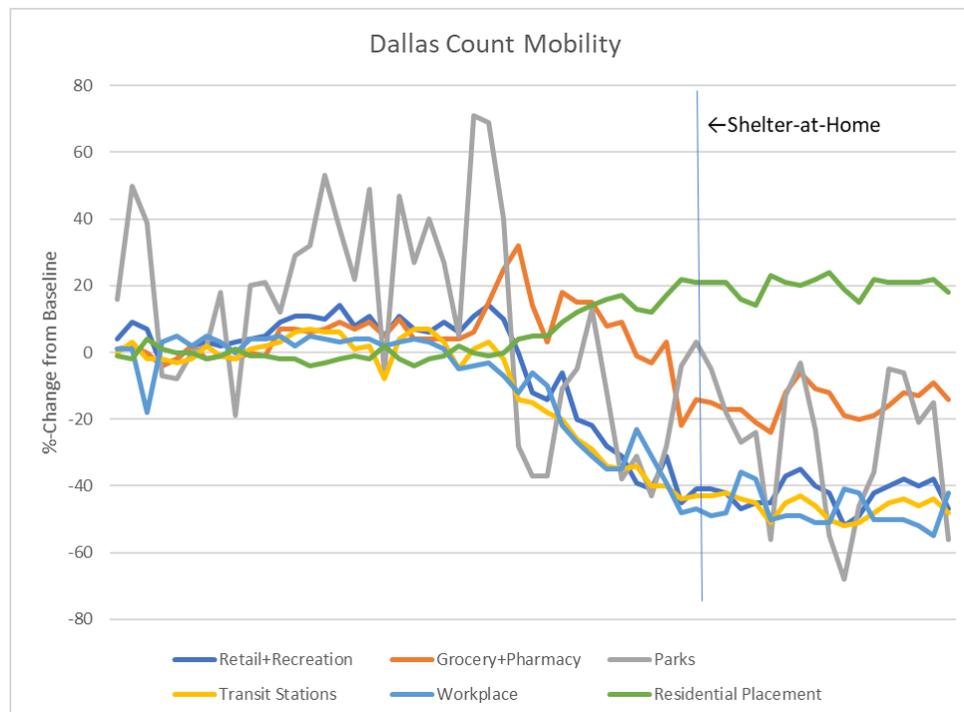
       The current study does not provide any evidence for lasting increases or sustained higher levels of domestic violence because of the pandemic. However, these results were based on a short-term analysis. Further research should continue to evaluate whether the long-lasting lockdowns, resulting financial stress, and increased time at home did affect domestic violence. In fact, more recent systematic reviews of domestic violence and COVID-19 studies do show moderate to strong increases in domestic violence incidents between pre- and post-lockdown periods.

       The current study used data from months at the very beginning of the pandemic. Time has demonstrated that despite vaccines and differing responses to COVID-19, the virus is likely here to stay. Many people still work from home and many, still, have been laid off. Researchers must continue to evaluate the collateral consequences and adverse effects that these changes in our lives have on persons throughout the world, including on domestic violence.

References

Agnew, R. (1992). Foundation for a general strain theory of crime and delinquency. Criminology, 30(1), 47-88.

Cohen, L. E., & Felson, M. (1979). Social change and crime rate trends: A routine activity approach. American Sociological Review, 588-608.

CW39. (April 3, 2020). Houston COVID-19 update: Increased cases; domestic violence, assault, burglary also up. https://cw39.com/news/local/houston-covid-19-update-increased-cases-domestic-violence-assault-burglary-also-up/.

Gonzalez, Jose R. (March 30, 2020). Montgomery County's DA's office sees 35 percent increase in domestic violence cases during coronavirus isolation.

Kamenetz, A. (2020). I was a Screen–Time Expert: Then the Coronavirus Happened. New York Times.

Neuman, Scott. (April 6, 2020). Global lockdowns resulting in 'horrifying surge' in domestic violence, U.N. warns. https://www.npr.org/sections/coronavirus-live-updates/2020/04/06/827908402/global-lockdowns-resulting-in-horrifying-surge-in-domestic-violence-u-n-warns

Piquero, A. R., Jennings, W. G., Jemison, E., Kaukinen, C., & Knaul, F. M. (2021). Evidence from a systematic review and meta-analysis: Domestic Violence during the COVID-19 Pandemic. *Journal of Criminal Justice*, 101806.

Solis, Natalie and Gerardo Martinez (March 23, 2020). *Cook Children's sees spike in child abuse cases likely from COVID-19 stress.* https://www.fox4news.com/news/cook-childrens-sees-spike-in-child-abuse-cases-likely-from-covid-19-stress

Townsend, Mark. The Guardian. (April 4, 2020). *Domestic abuse cases soar as lockdown takes its toll*. https://www.theguardian.com/world/2020/apr/04/domestic-abuse-cases-soar-as-lockdown-takes-its-toll

United Nations. 2020. *UN chief calls for domestic violence 'ceasefire' amid 'horrifying global surge'*. https://news.un.org/en/story/2020/04/1061052

United Nations Women. (2020). *Covid-19 and ending violence against women and girls.* United Nations . https://www.unwomen.org/en/digital-library/publications/2020/04/issue-brief-covid-19-and-ending-violence-against-women-and-girls

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