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ABSTRACT

Assaults during Lockdown in NSW and Victoria

We study the relationship between Covid-19 lockdowns and domestic assaults in New South Wales and Victoria using police data on crime by Local Government Area over the period 2019-2020. We apply both Ordinary Least Squares and a fixed effect estimator, and find that domestic assaults decline during the lockdowns of 2020, but less than other types of assaults. As a result, there is a higher relative incidence of domestic assaults rather than an overall increase in crime. The results are robust to omitted variable bias based on Oster's (2019) test, and mimic Boman and Gallupe (2020) - a similar study carried out in the US.

JEL Classification: I10, K42

Keywords: domestic assault, COVID-19, lockdowns, crime

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1. Introduction

On the 20th of January 2020 the Director-General of the World Health Organisation declared the novel coronavirus outbreak to be a public health emergency of international concern (World Health Organization, 2020). Following this announcement, governments around the world adopted containment and reduction strategies to limit the spread of COVID-19 (Wilder-Smith and Freedman, 2020). The approaches implemented have enforced a combination of social distancing and stay-at-home orders.

Though the strategies that have been employed by governments have had the principal objective of limiting the spread and impact of COVID-19, they have also resulted in disruptions in the everyday lives and routine activities of individuals. Anxiety and stress levels have risen across the population but especially for households at the lower end of the income distribution (e.g. Paloyo et al, 2020).

Over the first year of Covid-19 and the ensuing restrictions, news of domestic assaults has become more common. Indeed, in November 2020 the Guardian, a prominent independent Australian newspaper, published an article defining 2020 as “the worst year” for domestic violence in Australia (<https://www.theguardian.com/society/2020/dec/01/the-worst-year-domestic-violence-soars-in-australia-during-covid-19>). Is it the case? Have domestic violence crimes risen as a result of the lockdowns?

We investigate this hypothesis using detailed police data on crime reported by Local Government Area (LGA) in the two most affected states: New South Wales and Victoria. Our analysis captures the 24 months of 2019 and 2020 and compares trends in domestic and non-domestic assaults exploiting spatial variation in the imposition of lockdowns in the two states by LGA. We restrict our analysis to assaults to reduce the potential heterogeneity across various types of crimes vis-à-vis their potential links to mobility, using the maintained, likely assumption that mobility affects each type of crime to varying degrees. Domestic assaults are classified as such when they involve “family violence”, as assessed by police (Victoria), or relate to “domestic violence” based on the Crimes (Domestic and Personal Violence) Act 2007 in New South Wales. We use the term ‘domestic assaults’ to define assaults flagged as related to domestic or family incidents.

We find that the reduction in mobility associated with lockdowns reduces the number of reported crimes, but the reduction is much larger in non-domestic relative to domestic assaults. As a result, domestic assaults have risen, but only in relative terms: lockdowns are associated with a compositional shift rather than an increase in the number of crimes. Against the background of rising trend in domestic assault in NSW over last 5 years (NSW Bureau of Crime Statistics and Research, 2021) and overall increase in family violence related criminal offences in Victoria (Crime Statistics Agency, 2020), reported incidents of domestic assaults decreased during the lockdown period.

The rest of the paper is organised as follows. Section 2 provides a brief overview of the literature on crime. This is followed by a description of the data (Section 3), methodology (Section 4) and results (Section 5). Section 6 concludes.

2. Literature

Competing views exist with reference to the relationship between mobility and crime. The most common view suggests that routine activities of individuals contribute significantly to when and where crime has a higher likelihood of occurring. Crimes are more likely to be committed when the following three elements intersect – a motivated offender, a suitable target, and the absence of a capable guardian (Cohen and Felson, 1979). Individuals living their routine lives would already have all three elements necessary to produce the physical conditions for most criminal incidents. Any interruptions to the routine activities of potential offenders and victims may have a significant effect on the timing and the locations of where the crimes occur (Brantingham and Brantingham, 1995).

The restrictions implemented by state governments inherently altered both individual and community behaviour and thus resulted in changes in criminal opportunities and shifting criminal motivations (Campedelli, Aziani and Favarin, 2020). COVID-19 containment measures, such as lockdown and restrictions, disrupt the routine activities and spaces that offenders interact in, reducing opportunities for potential criminal activities. Decline in economic and social activities outside of the household during a lockdown reduces the opportunity of interactions between victims and criminals. Hence, we expect that assault in general and violence targeting women outside the household decreases during the lockdown. In line with this theory, Shen, Fu and Noguchi (2021) find that the 2020 lockdown in Japan led to a 12.7% decline in violent crime victimization rates per 100,000 people.

The competing view on mobility and crime, proposes that the existence of negative stimuli may lead to an increase in criminal activity (Agnew's 1992 general strain theory). Stressors may prevent individuals from attaining positive goals, decrease access to positive stimuli or increase negative affect due to exposure to negative stimuli. The potential financial stress and anxiety due to employment uncertainty (Felson et al., 2012) and stress associated with social isolation may create or exacerbate negative stimuli for individuals. Additionally, the inability for individuals to achieve positively valued goals, due to social distancing and stay-at-home orders, may lead to increases in negative emotional responses. Thus, the increase in negative stimuli due to lockdowns, such as job loss, financial stress, and increased anxiety due to employment uncertainty (Felson et al., 2012), may lead individuals to engage in criminal activities they might otherwise forgo.

To the extent that crime such as assaults are related to distress, there is no doubt the COVID-19 crises led to increase in mental distress. Parents, particularly, fathers, unemployed and parents of young children experiences significant distress during this time in Australia (Broadway, Méndez and Moschion, 2020). While Australia's socio-economic response to COVID-19 has been successful in containing the spread of the virus, it has highlighted the social inequalities and vulnerable groups and might leave increasing disparities in access and opportunities (O'Sullivan, Rahamathulla and Pawar, 2020).

Since the World Health Organisation declared the novel coronavirus outbreak to be a public health emergency of international concern, an emerging literature has studied the impact that social distancing and stay-at-home orders have on the incidence of crime. Empirical findings about the link between lockdown and domestic violence are mixed. For example, using data for police calls during the lockdown in some cities in the US, Leslie and Wilson (2020b), Mohler et al. (2020) and Sanga and McCrary (2020) show an increase in police calls for

domestic violence. Mixed or opposite results have been found in other US cities (Ashby, 2020) as well as Mexico (Hoehn-Velasco et al., 2021).

One important factor to consider here is that police calls for service do not necessarily translate into official crime reports. A call to police may not proceed to be recorded as an offence, depending on the severity of the crime and judgements and decisions of persons involved in the situations. Important differences between physical abuse or violence and psychological violence get lost in broad offence categories in the police and crime data and can be one possible explanation for the observed difference between police calls and crime reports (Arenas-Arroyo et al, 2020; and Mohler et al., 2020).

With reference to Australian studies, Payne and Morgan (2020) find no significant difference in the occurrence of common assault, serious assault, sexual offences, and breaches of domestic violence orders in Queensland on the basis of data up to March 2020, when restrictions were first introduced in the state. In fact, there was a significant decrease in the rate of recorded serious assault and sexual offending in the very early stages of the pandemic during April 2020. The Household Impacts of COVID-19 Survey in Australia, carried out in October, June and April 2020, includes a question about relationship difficulties, and shows that the proportion of relationship difficulties was higher around the lockdown time (April and October). This is especially the case for women in Victoria, where lockdowns were both longer and repeated relative to other Australian states.

3. Data

The data is sourced from crime data provided by the New South Wales Bureau of Crime Statistics and the Crime Statistics Agency of Victoria. These agencies collect data of the monthly count of reported offences, with the data aggregated at state level, and by Local Government Areas (LGAs). Data is updated monthly and the most recent addition for New South Wales and Victorian data to date is December 2020. There are 128 LGAs in New South Wales and 79 LGAs in Victoria. Data on median personal income in LGAs is sourced from Australian Bureau of Statistics (Personal Income in Australia).

Table1 Personal Income at LGA level in 2017-8018

	New South Wales	Victoria
Median	50,153.0	49,266.0
1 st quartile	42151.5	42003.0
3 rd quartile	50888.0	50017.5

Source: Personal Income in Australia, Australian Bureau of Statistics

While comparable, each state uses different classifications for offences and for flagging domestic violence of family related offences. We concentrate on offences recorded under the ‘assaults’ category. New South Wales provided data on subcategories of assault, identifying ‘domestic violence related assaults’ as a separate category from other types of assault. Data from Victoria instead records a ‘family incident flag’ against reported offence categories. We focus on the narrowly defined and comparable category of ‘offence, assaults’ to estimate the differential effect of lockdown on overall offences and domestic offences as suggested by the

literature though acknowledge that both states use slightly different definitions to identify domestic assaults (this leads us to add a state in addition to LGA fixed effect in the empirical analysis).

Information on lockdowns is publicly sourced from the announcement dates made by each Premier. Victoria experienced longer lockdowns compared to New South Wales. In New South Wales, a lockdown was imposed during April 2020 and this was lifted in May 2020 (Storen and Corrigan, 2021). New South Wales remained without widespread restrictions for the rest of 2020. Victoria, in contrast, experienced prolonged lockdown conditions. Similar to NSW, Victoria had no restrictions on mobility till March 2020. A State of Emergency was declared by the Victorian Government on the 16th of March 2020 (Victorian Government Gazette, 2020) which was lifted in June 2020. Between July 2020 to September 2020, Victoria was again in lockdown. We therefore identify the lockdown with April 2020 for NSW (1 month), and April-May 2020 and July-October 2020 (5 months) for Victoria.

To compare the effect of lockdown on crime we use data from 2019, as it provides a pre-COVID base comparison for both states. Overall, as shown in Table 2, 4.2 percent of the observations pertaining to New South Wales in the working sample, and 20.5 percent of the observations in Victoria, were under lockdown.

Figure 1 provides a timeline of the evolution of domestic and other assaults, by state, for the 24 months analysed. The vertical axis shows the trend in average number of domestic assaults and other assaults for each month in our sample relative to the month of January 2019. Overall, both domestic and other types of assault display seasonal patterns, especially for NSW, and a sharp decline during the lockdown periods. However, the decrease in domestic assaults during lockdown was smaller than the drop in other assaults in the corresponding lockdown period, especially in NSW, resulting in a temporary compositional shift, in this case a rise, in the proportion of domestic assaults rather than an increase in the overall number of domestic assaults.

Figure 1 Assaults in New South Wales and Victoria (Jan 2019 to Dec 2020)



Notes: Data includes all LGAs from Victoria and New South Wales, average offences at state level relative to January 2019. 24 Monthly observations from January 2019 to December 2020, 1 denotes Jan 2019 and 24 denotes Dec 2020. Lockdown is April 2020 (NSW) and April-May 2020 and July-September 2020 (VIC).

Source: New South Wales Bureau of Crime Statistics; Crime Statistics Agency of Victoria

The effect of lockdown on average assault crimes is perhaps clearer in the summary data reported on Table 2, which reports the average monthly number of assaults by type, state and lockdown status. Although these figures are not weighted by population size, they nevertheless indicate the marked decline in the number of other assault types vis-à-vis domestic assault during lockdown times.

Table 2: Mean Number of Assaults by State (Jan 2019-Dec 2020)

	NEW SOUTH WALES		VICTORIA	
	No lockdown	Lockdown	No lockdown	Lockdown
Domestic assaults				
Monthly mean	2,659	2,244	981	627
As % of no lockdown	100%	84.4%	100%	63.9%
<i>Observations</i>	<i>3,013</i>	<i>131</i>	<i>4,835</i>	<i>1,247</i>
Other assaults				
Monthly mean	2,618	1,609	429	137
As % of no lockdown	100%	61.5%	100%	31.9%
<i>Observations</i>	<i>6,026</i>	<i>262</i>	<i>5,886</i>	<i>1,512</i>

Notes: Data includes all LGAs from Victoria and New South Wales over the period January 2019 to December 2020, and are **not** adjusted by state population size. Lockdown is April 2020 (NSW) and April-May 2020 and July-September 2020 (VIC).

4. Methodology

As the series on domestic and other assaults do not appear to display any particular trend over the period, besides seasonal patterns, we use standard estimation techniques rather than estimators accounting for I(1) or higher order processes.

We estimate the effect of the lockdown according to the statistical model:

$$y_{ist} = \alpha + \beta Lock_{st} + \gamma Dom + s\delta_1 + time\delta_2 + State\delta_3 + \varepsilon_{ist} \quad (1)$$

where y is the total number of monthly assaults, i is a dummy variable indicating whether it is domestic or other assault, respectively, s is the LGA, and t is an indicator of the month (time trend going from 1 to 24). The variable $Lock$ indicates whether crime occurs at a time of lockdown. Dom is a dummy variable equal to one if the assault is domestic-related and zero otherwise, $State$ indicates if the LGA is located in NSW or Victoria, and ε is an idiosyncratic error term. Using LGA fixed effects ensure that time-invariant differences between locales are accounted for. This likely applies to population, too, given the relatively short time span covered in the analysis (24 months).

We initially perform regressions by Ordinary Least Squares (OLS) separately, by type of assault (i.e. without the variable Dom). As shown in the relevant columns of Table 3, β is negative, implying that lockdowns are negatively associated with the average number of crimes committed in a month over the period. In the case of domestic violence, lockdown reduces the count of assaults by 4.6 crimes/month, but in the case of other types of assaults

the decrease is almost double (8.063). The months in lockdown are therefore associated with a *decline* in the monthly number of *both* crimes, but at different *rates*. As a result, the relative composition of assault crimes tilts in favour of domestic violence, but that occurs in the context of a declining number of both assaults.

This lockdown effect is perhaps better seen when the model is estimated on pooled data across both domestic and other types of assaults:

$$y_{ist} = \tilde{\alpha} + \tilde{\beta}Lock_{st} + \tilde{\gamma}Dom + \theta Dom Lock_{st} + s\tilde{\delta}_1 + time\tilde{\delta}_2 + State\tilde{\delta}_3 + \epsilon_{ist} \quad (2)$$

where all variables are identical to the single-crime specification, but the parameter of interest is θ - the effect of lockdown interacted with *Dom*, the dummy variable for domestic assaults.

The results under the column labelled ‘pooled’ in Table 3 suggest that θ is both positive and statistically significantly different from zero: on average during lockdown domestic assaults, adds about 2.265 crimes to the monthly count of assaults: domestic violence during lockdowns because it has become more common in relative terms though the count of assaults is lower if either it occurs during a lockdown or if it is a family-related assault.

Table 3: Effect of lockdown on Assaults

Dependent variable: monthly count of offences	Assaults (Pooled)	Domestic Assaults	Other Assaults
Lockdown	-7.498*** (0.617)	-4.652*** (0.382)	-8.063*** (0.654)
Domestic-related assault	-4.903*** (0.296)		
Lockdown * Domestic-related assault	2.265*** (0.838)		
LGA fixed effects	YES	YES	YES
State fixed effects	YES	YES	YES
Controls for time	YES	YES	YES
Observations	22,912	9,226	13,686
R-squared	0.818	0.928	0.880
Oster delta	1.490	-4.993	-3.626

Notes: Estimations includes LGAs from Victoria and New South Wales. Monthly observations from January 2019 to December 2020. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

To verify if the results are robust to the possibility of omitted variable bias we run the test developed by Oster (2019). This approach exploits the fact that the bias from observed variables informs to some extent about the bias of unobserved confounders by assuming proportionality between the two biases. Estimating movements in coefficients and R^2 , this method enables the identification of how large the explanatory power of unobserved variables would have to be to render the estimated treatment effect insignificant. A value of 1 is

normally regarded as a benchmark: absolute values above it imply that the results are unlikely subject to omitted variable bias. In contrast, the results are likely driven by omitted variable bias if absolute values are between zero and one (the negative sign implies that the direction of bias from observed and unobserved covariates is opposite).

The last line of Table 3 shows the results of Oster’s test: they are well in excess of the benchmark, implying that unobserved covariates do not present a threat to the results presented. As a result, the estimates reported in Table 2 can be considered ‘robust to omitted variable bias’ (Oster, 2019).

We then perform separate analyses on two groups of LGA, depending on whether they are below or above the median income to explore the heterogeneity of assaults with respect to income levels and more broadly socio-economic status.

Table 4: Effect of lockdown on Assaults by median income in LGAs

Dependent variable: count of assaults	Low income LGAs	High income LGAs
Lockdown	-8.519*** (0.540)	-5.744*** (1.440)
Family related assault	-2.269*** (0.350)	-10.310*** (0.540)
Lockdown * family related assault	3.677*** (0.903)	-0.096 (1.677)
LGA fixed effects	YES	YES
State fixed effects	YES	YES
Control for time	YES	YES
Observations	15,340	7,572
R-squared	0.848	0.725

Notes: Estimations includes LGAs from Victoria and New South Wales. For low income LGAs: sample restricted to LGAs with median income below the respective state median income. For high income LGAs: sample restricted to LGAs with median income above the respective state median income. Monthly observations from January 2019 to December 2020. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4 summarises the results. The main coefficient of interest is the interaction between timing of assault (during lockdown or else) and type of crime (domestic or other). The point estimates suggest that the relative increase of domestic assaults occurs in LGAs below median income: the effect is no different from zero in LGAs with above-median incomes. This is perhaps not surprising, as individuals in lower socio-economic status might have less opportunity to relieve stress and anxiety outside the households. At the same time, it points that socio-economic and assault status are not only related but the former likely influences the latter. As a result, solutions that target relative deprivation may reduce crime and the public resources used to fight it.

We explored the role of unemployment rate at LGA level in this relationship between lockdown and assaults. We re-estimate the statistical models (1) and (2) after adding controls

for unemployment rate at the LGA level¹. The results (available from authors) are similar in magnitude and significance to those reported here.

So, how do these results square with the newspaper headlines that domestic violence has grown during the lockdown imposed to combat Covid-19? Besides our suggestion that the increase is the result of a relative shift, rather than an increase in absolute numbers, two important caveats should be highlighted. First, there is a difference in the crime reported by support agencies and police reports, as personal conditions may self-select sub-groups of the population to seek support through agencies but not through the police, and vice-versa. We use police reports and as such are bound to its advantages and limitations. The reports enable us to have consistent definition over time and across regions. However, they are likely to suffer from under-reporting and may not capture the full extent of distress in the community.

The second caveat is that police reports do not measure the total extent of domestic violence and distress. As such, it is not possible to disentangle assaults that occur as a result of conditions (e.g. psychological) from other assaults that generate domestic violence and distress. There is further possibility that lockdown may cause a change in reporting behaviour. For example, the victims were not able to leave home so, could be reluctant to report violence because of the possible consequences to them and other family members.

Our study underlines the key distinctions (i) between calls and official reports and (ii) between absolute numbers and relative shares. Bullinger, Carr and Packham (2021) show that stay-at-home policies in Chicago resulted in an increase in domestic violence-related calls for police service, but a decrease in total calls. In line with the present results, official reports by police officers and arrests for domestic violence crimes fell by 6.8 percent and 26.4 percent, respectively. The lockdown measures lead to a decline in overall crime, however, reduction in domestic violence crimes is around 5 times smaller than the decline in overall crime rates.

5. Conclusion

We use police record data to test whether the lockdown imposed to reduce the spread of Covid-19 raised the count of domestic assaults in New South Wales and Victoria. We find that domestic assaults have only increased in relative terms, as the lower mobility generated by the lockdown is associated with lower crime counts, especially in non-domestic crimes. Notwithstanding the limitations of the data and a relatively simple analysis, we find that such effect is almost entirely occurring in LGA with below-median income levels. We show that all assaults, including domestic assaults, decreased during lockdowns in absolute terms. Our results point to the need to carefully distinguish between reported offences and other measures of crime and absolute number of crimes and relative shares.

¹ The unemployment rate was sourced from Small Area Labour Markets (SALM), March quarter 2021, produced by the National Skills Commission (<https://lmip.gov.au/default.aspx?LMIP/Downloads/SmallAreaLabourMarketsSALM>)

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