

Relationship between the coronavirus pandemic and criminal activities: Emerging evidence from Fiji Islands

Kunal Singh¹, Tayyab Shah², and Amrit Raj³

¹British High Commission, Gladstone Road, Suva, Fiji

Email address: kunalsingh.usp@gmail.com

²Corresponding author: University of Saskatchewan, Canadian Hub for Applied and Social Research, 9 Campus Drive, Saskatoon, SK, Canada

Email address: tayyab.shah@usask.ca

³University of the South Pacific, School of Agriculture, Geography, Environment, Ocean and Natural Sciences

Email address: amrit.raj@usp.ac.fj

ABSTRACT

Introduction: The spread of the coronavirus has led to strict containment measures around the world, simply to restrict the gathering of a large number of people. In Fiji, the COVID-19 lockdown measures are affecting different social aspects, including crime rates and criminal activities.

Methods: This study was based on a secondary analysis of aggregated crime data, presenting preliminary analyses on crime trends across the Fiji Islands, during the first six months of the curfew period. It considers how the crime patterns shifted due to the numerous containment restrictions. We studied the crime data during the first six months of the curfew period, starting from March 31 to September 30, 2020, against the average of crime occurrences for the same period over the last four years (2016-2019).

Results and Discussion: The study shows an overall increase of 18.8% in crime occurrences, during the curfew period. The disobedience against lawful orders were largely made up of curfew breaches (with an astounding increase of 2602 cases), with the southern and western divisions registering the majority of offences. The study also provides evidence of a decrease in offences against public morality (-41.7%) and property (-26.8%) during the curfew period, which could most likely be linked to strict stay-home restrictions and limited mobility. Criminal offences such as burglary (-24.6%), theft (-22%) and aggravated robbery (-23.3%) show a decreasing trend in the curfew period. However, a worrying increase in offences against the drugs ordinance act (104.4%), common assault (28.6%), serious assault

(97.4%) and criminal intimidation (36.8%) is noted in this study. It could be interpreted that the central division (-46.4%) was possibly the safest area in Fiji during the first few months of the curfew, while the southern (17.9%) and western (29.2%) continue to show an increasing crime trend.

Conclusion: The findings of this research are consistent with the predictions of the routine activity theory, which estimates crime rates to fluctuate during an exceptional event. Regardless of some limitations and directions for future research, the current study contributes to the literature on exceptional events and crime through an ongoing pandemic in the South Pacific.

Keywords: Coronavirus, Fiji, lockdown, crime rates

Introduction

The novel coronavirus (COVID-19) pandemic is undoubtedly one of the most significant global events in recent history. It is tempering sociocultural norms, increasing fragility of national economies, weakening human rights, intensifying political and social tensions and slackening developments for the probable future (Hodgkinson & Andresen, 2020; Stickle & Felson, 2020). COVID-19 has become a worldwide public health pandemic and was declared a public health emergency of international concern in January 2020. COVID-19 led to an unprecedented shift in the social norms of global cities (Hodgkinson & Andresen, 2020). However, the pandemic crisis threatens to disproportionately hit Pacific Island Developing Countries (PIDCs), not only as a health crisis in the short term but as a devastating social and economic crisis over the months and years to come. A recent assessment report published by the United Nations Development Programme (UNDP) highlights that the pandemic brings associated income losses exceeding approximately \$220 billion in developing countries (UNDP, 2020). With an estimated 55 percent of the population in the Pacific having little to no access to social protection (UNDP, 2020), such income-related losses will reverberate across societies, impacting education, human rights, and can create food insecurity and instability (United Nations Pacific, 2020; WHO, 2020). This may be further exacerbated by a spike in cases, as up to 75 percent of people in the least developed countries lack access to proper sanitary and hygiene supplies (United Nations Pacific, 2020).

The impact of this pandemic crisis is anticipated to be long-lasting and will probably intensify pre-existing inequalities common across societies. Fiji and other PIDCs have recorded significant COVID-19 cases, and governments have been quick to implement public health emergency measures, including lockdowns, curfews, travel restrictions, and international border closures (United Nations Pacific, 2020). In Fiji, the first COVID-19 case was announced on the 19th of March, 2020. As of April 23rd, 2021, Fiji has recorded a total of 78 cases (for the monthly cumulative cases, see Figure 1), including 2 COVID-related deaths.

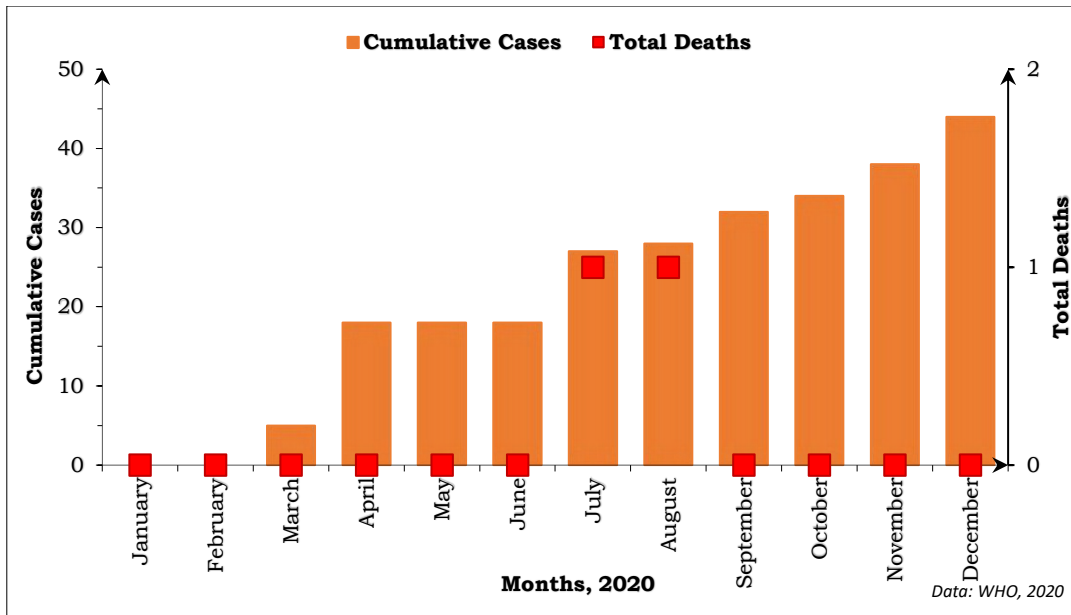


Figure 1. Monthly COVID-19 cases reported in Fiji (Data source: WHO, 2020)

In their efforts to reduce the impacts of COVID-19 and prevent local transmission, on March 31, the Fiji government announced public health measures in the country, including restricted movements, bans on mass gatherings, community quarantine, school and workplace closure, curfews, and lockdowns. Lockdowns were implemented in two major cities, Lautoka and Suva, following the announcement of Fiji's first COVID-19 case (United Nations Pacific, 2020). Further, the Fijian Government took proactive and effective measures to identify, monitor, and manage COVID-19 case developments. For example, such measures included the contact tracing initiative, establishing fever clinics to assess people who may be infected with COVID-19, and supervised home quarantine to ensure the safe delivery of clinical services (United Nations Pacific, 2020). However, the fallout of the COVID-19 pandemic and countries' responses to it, are having unprecedented impacts on our societies, disrupting the functioning of criminal justice systems worldwide (UNODC, 2020). The pandemic has intensified the fragile nature of Pacific countries to become even more vulnerable, where daily crime is posing an immediate risk to human security (SOUSA-SANTOS, 2020). In Fiji, as the country attempts to warrant an immediate response to contain the spread of the virus and stabilize economies in a sustainable and resilient manner, social concerns, such as criminal activities, continue to burden the judicial and law enforcement authorities. The effects of social distancing, contraction anxiety, unemployment and intensified domestic disputes are but a few factors to heightened crime rates in developing countries (Miller & Blumstein, 2020). Existing research on crime and exceptional events (e.g. pandemics or natural disasters) shows that a shift in collective

behaviour can often lead to shifts in criminal behaviour (Ashby, 2020; Drabek, 1986).

Theoretical explanations for shifts in crime rates and exceptional events include social structure, social disorganization and opportunity theories (Hodgkinson & Andresen, 2020). Interestingly, the heavily criticized social cohesion or altruism theories, predict that crime rates decrease or remain fairly constant during an exceptional event (Zahran, Shelley, Peek, & Brody, 2009). The social disorganization theory shows that crime rates will unquestionably increase as the social order is disrupted (Frailing & Harper, 2016; Prelog, 2016). The social disorganization theory contradicts the social theory; it argues that exceptional events intensify social inequality and make people vulnerable (Hodgkinson & Andresen, 2020). Finally, the opportunity theory states that crime rates would most likely increase or decrease, depending on the balance between the crime type and the opportunity structure (Leitner, Barnett, Kent, & Barnett, 2011). For a crime event to occur, a suitable target, a motivated offender and the lack of a capable guardian need to relate in time and space (Cohen & Felson, 1979). According to Cohen and Felson (1979), and the routine activity theory, crime rates increase due to a sudden increase in opportunities during exceptional events.

The effect of exceptional events on the crime rate shows mixed results in the literature. The difference, explained by the crime theories could most likely be a result of locality, social structure and the nature of the exceptional events. For instance, the New Zealand earthquake in 2010 and 2011 resulted in a significant drop in crime rates in Christchurch (Breetzke & Andresen, 2018), whereas during a flood in Brisbane, Australia in 2011, criminal activities fluctuated throughout the flood event, but eventually returned to previous levels soon after the event ended (Zahnow, Wickes, Haynes, & Corcoran, 2017). Similarly, the severe Hurricane Katrina in 2005 (Frailing & Harper, 2016) and Hurricane Hugo in the United States (Quarantelli, 2007) lead to significant increases in burglary and property crime respectively. While, there has been considerable attention given to changes in crime during and after other natural disasters (e.g. cyclones, floods, etc.), the COVID-19 pandemic is relatively unique in many aspects (Ashby, 2020). The pandemic is a 'slow-onset' emergency, which emerges over time and then varies in its impacts (OCHA, 2011). It is also unique, because it does not have a direct environmental impact, instead, the changes wrought by the pandemic are mostly related to human activity. This study examines how crime patterns can change during a lockdown situation that restricts human activities using the case of the pandemic in Fiji Islands. In particular, this study examines the crime trends across Fiji during the first six months of the curfew period, starting from March 31 to September 30 against the average of crime occurrences for the same period over the last four years (2016-2019). It is hoped that this research will contribute to informing

resource distribution and pandemic response approaches, and better help in a considered and effective recovery.

Methods

Fiji is an archipelago consisting of 332 islands covering a total land area of 18,333 km² within 1.3 million km² of the South Pacific (United Nations Pacific, 2020). The country has two major islands Viti Levu (10,429 km²) and Vanua Levu (5,556 km²) as shown in Figure 2. Fiji is administratively divided into five major divisions (i.e., west, east, central, south and north; see, Figure 2), which are further subdivided into fourteen provinces (Cronin & Neall, 2001). According to the 2017 Fiji Population Census, the total population stands at 884,887 where approximately 60% of the population are residing in urban centres (Fiji Bureau of Statistics, 2017). The distribution of population in terms of population density per square kilometres is displayed in Figure 2. Suva is the capital city and the administrative hub of the country. Fiji's economy is heavily reliant on the tourism industry and has suffered enormously from border closures and lockdowns. Fiji, which is already highly vulnerable to the deleterious impact of natural and climate change-related disasters, faces immediate health and social risks due to the pandemic (United Nations Pacific, 2020).

The study was based on a secondary data analysis exploring the crime incident data collected by the Crime Statistics Unit at the Fiji Police Force. Raw data was presented in Excel format and arranged across ten major fields: Division name, police station, type of offence, place of offence, unique identifier (i.e., code), day and time of the crime (including Year, Month, and Day). This study investigates the changes in crime occurrences during the first six months of lockdown (i.e., March 31st - September 30th) with a similar period in previous years. For a balanced comparative analysis, the study looked at averages in criminal occurrences from March 31st - September 30th, over four years (2016-2019) as a normal period, against March 31st - September 30th, for 2020 as a curfew period (United Nations Pacific, 2020; WHO, 2020).

Data cleaning, standardization, and analysis were conducted in Microsoft Excel where the PivotTable function was used to prepare the tables, crosstabs, and charts. Data analyses include determining the normal-over-curfew percentage change in crime occurrences (or counts) across different categorical variables including major offences, administrative areas (divisions, and police stations), monthly, and weekdays. A percentage change in crime occurrence was calculated by subtracting the normal period crime data (set as a base year; an average of 2016-2019 crime occurrences) from the curfew period crime data (i.e., 2020) and then dividing by the normal period data and multiplied by 100. A list of the top fifteen criminal offences during the curfew period along with the percentage changes was

also prepared. Next, a cross-tabulation approach was applied to analyze the relationships between the major offence categories and other categorical variables such as division, month, and weekday to further explore the trends in the percentage change in crime occurrences.

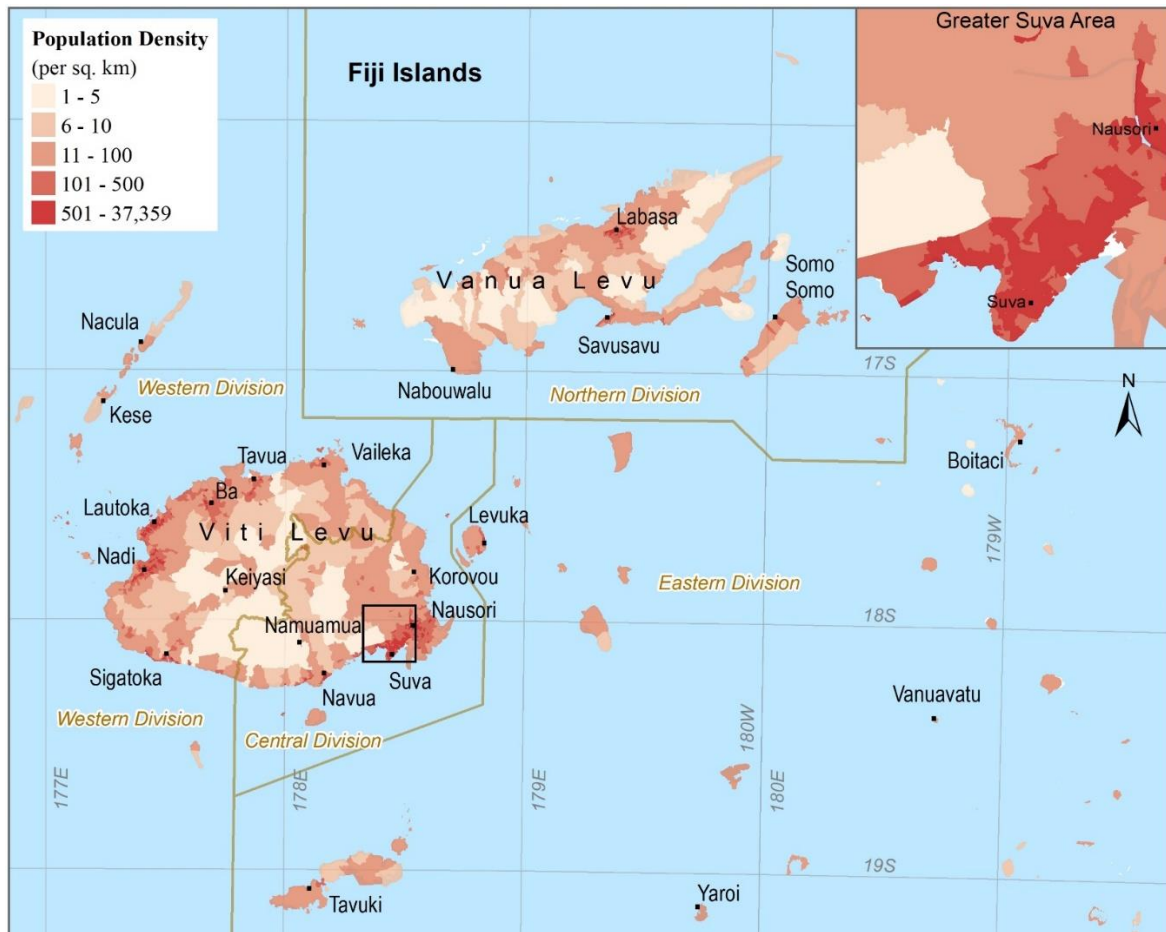


Figure 2. Division of Fiji Islands – study area map showing population density. Source of data: (Fiji Bureau of Statistics, 2017)

Results

Table 1 presents the crimes that occurred in the last five years (2016 to 2020; including normal and curfew periods) across the major offence(s) category. Between March 31st and September 30th, there was an increase in crime occurrences reported during the curfew period across Fiji Islands (i.e., 18.8%; 1,728 crimes) with an enormous increase in *offences against other acts*. Other notable increases include offences against lawful authority (14.2%; 275 crimes), against the person (10.8%; 2,840 crimes), and other offences against crime act (24.8%; 1,465 crimes). Offences against public

morality (-41.7%; 315 crimes) and property (-26.8%; 3,425 crimes) show a considerable decrease in the curfew period.

Table 1. Major Offence(s) category during curfew period and percent changes from the average of the last four years data for the same period (between Mar 31st and Sept 30th).

Major Offence(S) Category	Normal Period (Year) (between Mar 31st and Sept 30th)					Curfew 2020	% Change
	2016	2017	2018	2019	Average (2016-19)		
Against Lawful Authority	168	180	284	331	241	275	14.2
Against Public Morality	785	525	517	335	541	315	-41.7
Against The Person	2,627	2,450	2,556	2,616	2,562	2,840	10.8
Against The Property	5,820	5,003	4,447	3,449	4,680	3,425	-26.8
Other Offences Against Crime Act	1,105	1,135	1,394	1,060	1,174	1,465	24.8
Offences Against Other Acts	7		1		4	2,607	65,075.0
Total (between Mar 31st and Sept 30th)	10,512	9,293	9,199	7,791	9,199	10,927	18.8

Table 2 and Figure 3 shows the top fifteen criminal offences during the curfew period. Also, a percentage change in crime occurrence was recorded, where cases of disobedience of lawful orders registered an astounding 2602 offences in the curfew period, compared to no crime reported in the normal period. The increase in total crime occurrences, as indicated in Table 1 could be linked to the increased cases of disobedience against lawful orders. Offences related to assaults, including serious assaults (97.4%), common assaults (28.6%) and assaults causing actual bodily harm (2.2%) show notable change during the pandemic. Likewise, offences such as drug abuse (104.4%), criminal intimidation (36.8%) and criminal trespass (4.7%), show substantial increases in the curfew period. In contrast, there were decreased incidents of offences against property, including burglary (-24.6%), aggravated robbery (-23.3%), theft (-22%), damaging property (-9.1%) and fraud/false pretense (-74.5%). Also, the data showed a reduction in the number of rape cases and attempted rape (-19.3%) during the curfew period.

Table 2. Top 15 criminal offences offered during the curfew period and percent changes from the average of the last four years data for the same period (between Mar 31st and Sept 30th).

Criminal Offences	Major Offence(S) Category	Normal Period (Average: 2016-2019)	Curfew (2020)	% Change
Disobedience of lawful orders	Offences Against Other Acts	-	2,602	
Theft	Against The Property	2,434	1,898	-22.0
Assault Causing Actual Bodily Harm	Against The Person	1,818	1,858	2.2
Against Drugs Ordinance/Act	Other Offences Against Crime Act	419	856	104.4
Burglary	Against The Property	1,090	821	-24.6
Criminal Intimidation	Against The Person	268	366	36.8
Damaging Property	Against The Property	402	365	-9.1
Others Against Crime Act	Other Offences Against Crime Act	438	336	-23.2
Common Assault	Against The Person	261	336	28.6
Criminal Trespass	Other Offences Against Crime Act	256	268	4.7
Others Against Lawful Authority	Against Lawful Authority	181	229	26.5
Aggravated Robbery	Against The Property	256	196	-23.3
Serious Assault	Against The Person	76	149	97.4
Rape and Attempted Rape	Against Public Morality	117	94	-19.3
Fraud and False Pretense	Against The Property	353	90	-74.5
Total (between Mar 31st and Sept 30th)		8,366	10,464	25.1

Note: Disobedience of lawful orders - This term is used by Fiji Police Force to categorise crimes that include breaches or willfully disobeying any order, summons, warrant or command duly issued. In this case, they are primarily used to denote cases to do with curfew breaches.

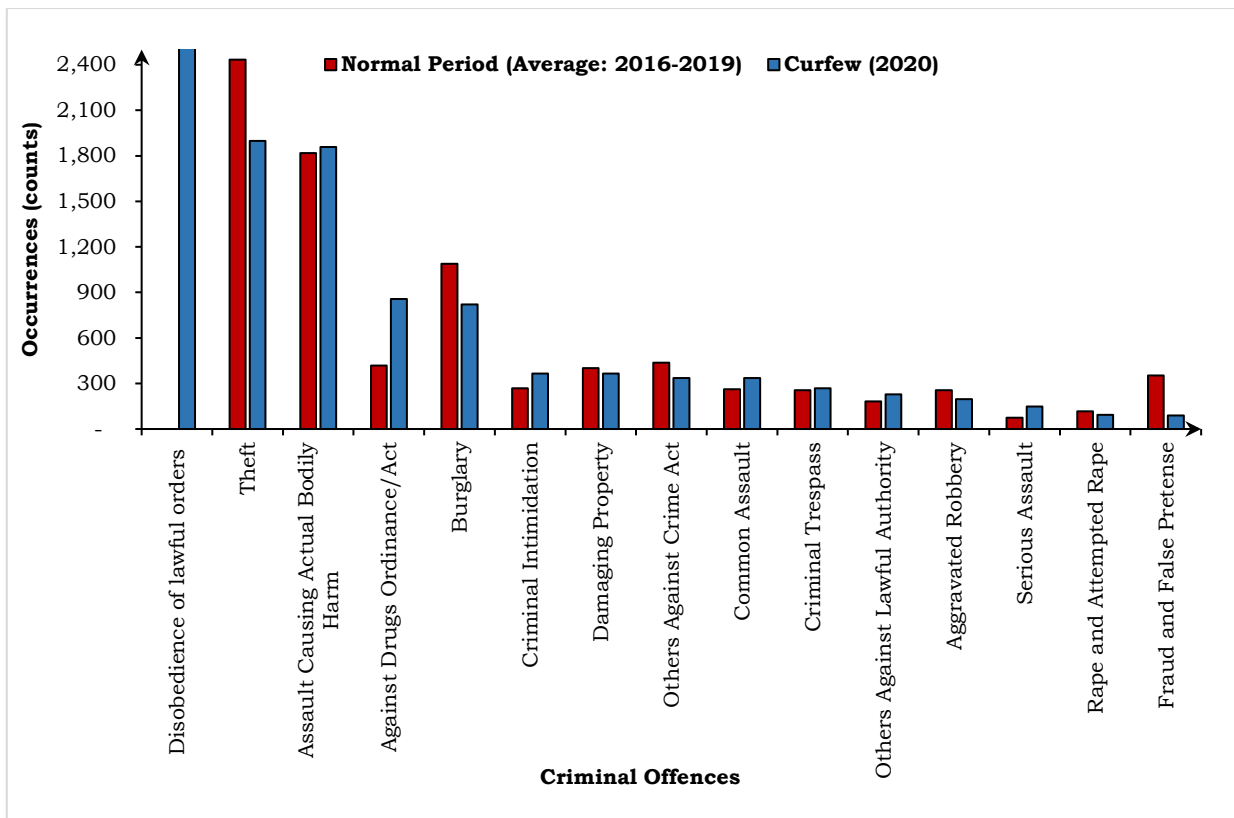


Figure 3. Distribution of the top 15 criminal offences during the curfew period and an average of the last four years (2016-2019) data for the same period (between Mar 31st and Sept 30th).

The distribution of crimes across five divisions are given in Table 3 (for police station level crime can be found in appendix A). The central division that encompasses the greater Suva region showed a massive change in criminal offences (-46.4%) during the curfew period, compared to the average of the same period in the four years preceding it (2016-19; 436 crimes). All other major divisions in Fiji including Eastern (38.9%), Northern (19%), Southern (17.9%) and Western (29.4%) show relative increases in crime trends during the curfew period as compared to the 4-year period (i.e., the average for the last four years).

Table 4 provides a wider understanding of the percent change in criminal offences relative to different divisions and major offences categories. Figure 4 further shows the distribution of criminal offence(s) across different divisions in the country. The central division records a major decrease (-46.4%) in crime occurrences across all major offence(s) categories. The eastern division demonstrates an overall increase (38.9%) in crime occurrences that is reflected by an increase across all major offence(s) categories, except for a drop in offences against property (-21.9%). Likewise, the northern division shows an overall increase in crime occurrences, and notable increases across all major offence(s), except for decreases in offences

against morality (-61.3%) and property (-2.2%). In the south, the high surge in crime occurrences could be attributed to the enormous increase in offences against other acts and lawful authority. All other offence(s) category shows relative decreases in the south. Likewise, the western division demonstrates an overall increase in crime occurrences, except for offences against public morality (-39.1%) and property (-20.9%). Generally, only offences against public morality (-41.7%) and property (-26.8%) show significant decreases in crime occurrences across all major divisions in the country.

Over the curfew period, an increase in the trend of offences against lawful authority (14.2%) and the person (10.8%) was observed in Fiji, despite a reduction in the number of cases reported in the central division. Likewise, there was a substantial increase in reported cases of “other offences against the criminal act” (24.8%) in the country. Offences against other acts, commonly comprising of cases related to disobedience and curfew breaches show the largest overall increase for the curfew period. Only the southern and western divisions show percent changes in Table 4, due to similar offences reported in these areas during the normal period (2016-19). Although the central, eastern and northern divisions show offences against other acts in the curfew period, these are not represented in the percent changes, due to no such cases recorded over the last four years in these divisions.

Major criminal offence(s) show increasingly high occurrences in the south and west of Fiji. The central division show reducing criminal offences in the curfew period. However, Figure 4 shows cases of offences against other acts, primarily disobedience and curfew breaches, which were not represented in Table 3 for central, east, and north. Offences against property show a small increase in occurrences in the north over the curfew period.

Table 3. Percent change in crime occurrences across five major divisions during the curfew period from the average of the last four years data for the same period (between Mar 31st and Sept 30th).

Geography (Division)	Normal Period (between Mar 31st and Sept 30th)					Curfew	% Change
	2016	2017	2018	2019	Average (2016-2019)	2020	
Central	1,150	780	932	480	836	448	-46.4
East	1,165	1,053	1,048	1,143	1,102	1,531	38.9
North	1,358	1,144	1,297	913	1,178	1,402	19.0
South	3,185	2,759	3,051	2,358	2,838	3,347	17.9
West	3,654	3,557	2,871	2,897	3,245	4,199	29.4
Total (between Mar 31st and Sept 30th)	10,512	9,293	9,199	7,791	9,199	10,927	18.8

Table 4. Cross-tabulation of major offence(s) category across different divisions to show the overall change in crime occurrences.

Major Offence(S) Category / Division	Central	East	North	South	West	Overall
Against Lawful Authority	-52.2	134.8	9.7	19.8	4.7	14.2
Against Public Morality	-50.0	4.9	-61.3	-50.7	-39.1	-41.7
Against The Person	-32.2	11.1	31.2	-8.9	25.6	10.8
Against The Property	-69.5	-21.9	-2.2	-27.3	-20.9	-26.8
Offences Against Other Acts				108300.0	14800.0	37142.9
Other Offences Against Crime Act	-33.0	45.9	25.3	-10.8	57.4	24.8
Overall	-46.4	38.9	19.0	17.9	29.2	18.8

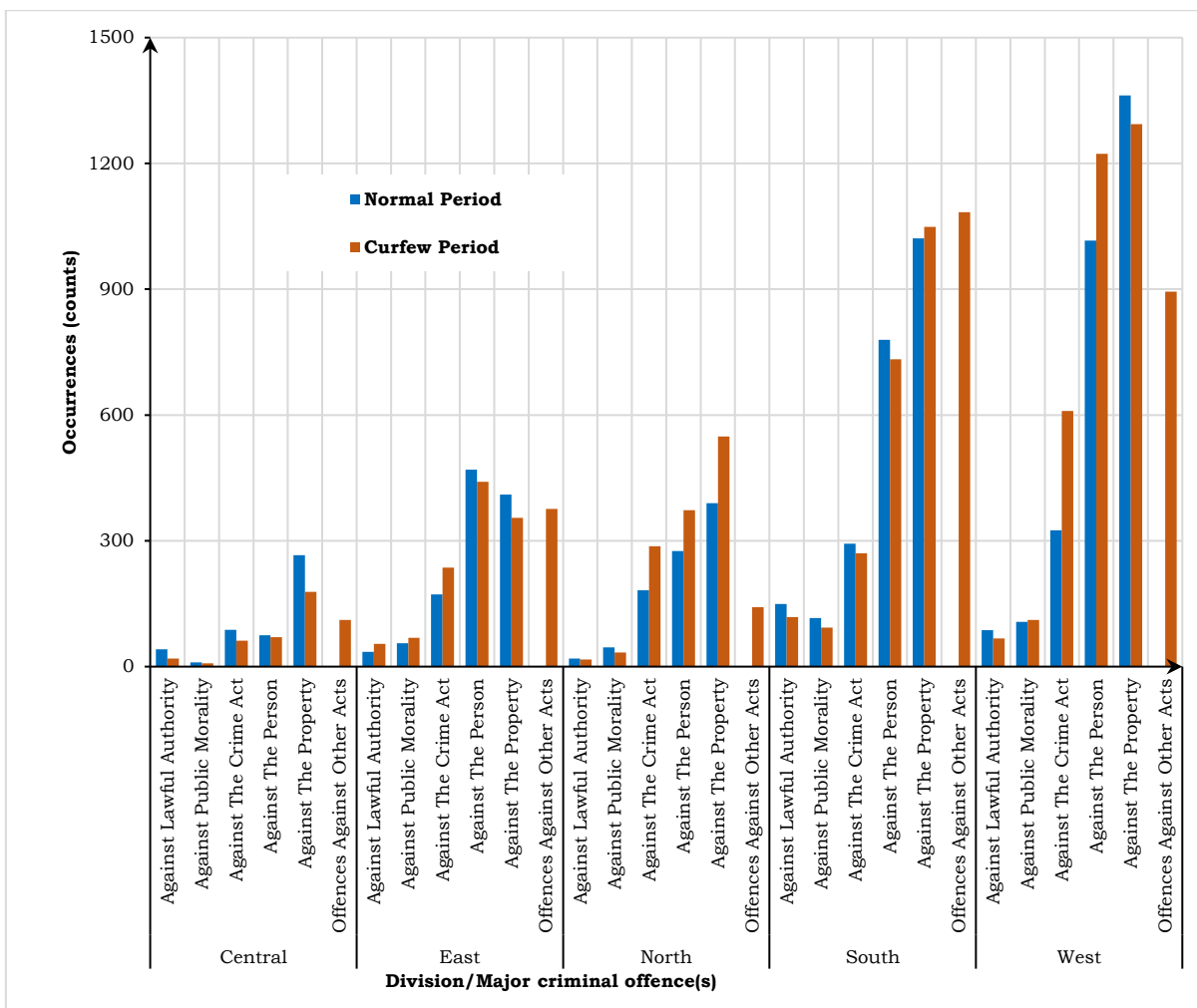


Figure 4. Total criminal offence(s) distribution during the curfew period and an average of the last four years data for the same period (between Mar 31st and Sept 30th) across major divisions in Fiji.

Table 5 represents total monthly crime occurrences during the curfew period, the average for the same period in the last four years and the monthly percentage change for the six-month analysis period. There is an increasing trend in total crime occurrences (18.8%) over the curfew period. April 2020, the first month, following the curfew announcement in Fiji shows a massive increase in crime (62.7%) in the country. May (25%) and June (3%), both show significant increases in criminal offences compared to the normal period (average for the same period over the last four years), but they show a decrease compared to the crime occurrences in April. July (-0.6%) records an all-time low in reported cases during the curfew period. August (20.4%) and September (11.4%) show steady increases in crime occurrences, compared to the normal period (earlier in the year and the average for the same period over the last four years).

The variation in the monthly crime occurrence across major offence categories is presented in Table 6. Offences against lawful authority (75%) and person (18.8%) were the most common form of crimes in March before the restrictions were announced. Immediately after restrictions, April and May show a rapid increase in offences against other acts, other offences against crime act and offences against lawful authority. There was a subsequent drop in offences against public morality, against the person and property. All major offences show a decreasing trend after the first two months of the lockdown, except offences against other acts. August noticed a spike in crime across the country, offences against lawful authority (25.1%) and person (26.3%) show notable increases. September notices an all-time low of criminal activities in the country, across major crime categories.

Table 5. Total monthly crime occurrences during the curfew period and percent change from the average of the last four years data for the same period (between Mar 31st and Sept 30th).

Month/Year	Normal Period					Curfew	% Change
	2016	2017	2018	2019	Average (2016-2019)	2020	
March	156	146	207	272	195	228	16.8
April	1,305	1,119	1,441	1,332	1,299	2,114	62.7
May	1,693	1,496	1,522	1,248	1,490	1,862	25.0
June	2,076	1,599	1,498	1,231	1,601	1,649	3.0
July	1,840	1,923	1,741	1,258	1,691	1,681	-0.6
August	1,903	1,599	1,370	1,200	1,518	1,828	20.4
September	1,539	1,411	1,420	1,250	1,405	1,565	11.4
Total	10,512	9,293	9,199	7,791	9,199	10,927	18.8

Table 6. Cross-tabulation of major offence(s) category across different months to show the overall change in crime occurrences.

Major Offence(S) Category / Month	March	April	May	June	July	August	September	Overall
Against Lawful Authority	75.0%	52.8%	103.4%	3.0%	-25.4%	25.1%	-39.6%	14.2%
Against Public Morality	-54.1%	-64.8%	-44.9%	-33.3%	-53.0%	-29.0%	-17.0%	-41.7%
Against The Person	18.8%	-1.0%	6.4%	4.7%	11.8%	26.3%	14.9%	10.8%
Against The Property	-10.7%	-39.1%	-33.5%	-37.6%	-31.1%	-6.5%	-11.2%	-26.8%
Other Offences Against Crime Act	-24.5%	96.9%	96.4%	8.4%	16.1%	-13.5%	-2.7%	24.8%
Offences Against Other Acts	0.0%	396700%	36460%	73300%	0.0%	0.0%	0.0%	130250%
Overall	16.8%	62.7%	25.0%	3.0%	-0.6%	20.4%	11.4%	18.8%

Table 7 represents total weekly crime occurrences during the curfew period, the average for the same period in the last four years and the weekly percentage change for the six-month analysis period. There is an increasing trend in total crime occurrences over the curfew period. Wednesday (-2.6%) and Saturday (-14.7%) are the only two days in the week that show a decreasing trend in crime occurrences in the country. The highest increase in crime occurrences occurs on Sundays (43.7%). The weekly crime occurrence across major offence categories is presented in Table 8. A sudden spike in offences against lawful authority is observed closer to the weekends, and continue to remain a concern early in the week before decreasing on Tuesday and Wednesday. Offences against public morality and property continue to show decreasing trends across the week, except for an all-time high in offences against property on Sunday. Offences against the person show a significant increase over the weekend, leading into Monday and Tuesday before showing a decreasing trend on Wednesday, Thursday and an all-time low on Saturday. Wednesday, Thursday and Saturday show a maximum increase in offences against other acts, primarily made up of curfew breaches. Saturday registers the highest number of offences against other acts in the week. Other offences against the crime act show an increasing trend throughout the week, except for a drop in cases on Wednesday and Saturday.

Table 7. Total weekday crime occurrences during the curfew period and percent change from the average of the last four years data for the same period (between Mar 31st and Sept 30th).

Weekday	Normal Period (between Mar 31st and Sept 30th)					Curfew	% Change
	2016	2017	2018	2019	Average (2016-2019)	2020	
Monday	1532	1363	1360	1164	1355	1749	29.1
Tuesday	2061	1782	1637	1078	1639	2144	30.8
Wednesday	1803	1727	1503	1434	1617	1575	-2.6
Thursday	1854	1298	1289	1015	1364	1536	12.6
Friday	1451	1293	1184	1064	1248	1674	34.1
Saturday	942	901	1299	899	1010	862	-14.7
Sunday	869	929	927	1137	965	1387	43.7
Total	10,512	9,293	9,199	7,791	9,199	10,927	18.8

Table 8. Cross-tabulation of major offence(s) category across weekdays to show overall change in crime occurrences.

Major Offence(s) Category / weekday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Overall
Against Lawful Authority	34.2%	13.3%	-15.4%	43.6%	21.9%	-19.3%	25.5%	14.2%
Against Public Morality	-35.6%	-23.7%	-51.5%	-46.5%	-38.3%	-62.1%	-39.3%	-41.7%
Against The Person	34.1%	29.8%	-10.9%	-1.5%	23.4%	-29.6%	22.9%	10.8%
Against The Property	-31.1%	-28.4%	-29.9%	-25.6%	-15.0%	-52.8%	-2.1%	-26.8%
Offences Against Other Acts	0.0%	0.0%	6180%	16550%	0.0%	27000%		65075%
Other Offences Against Crime Act	20.1%	50.5%	-4.5%	33.1%	63.3%	-19.7%	37.5%	24.8%
Overall	29.1%	30.8%	-2.6%	12.6%	34.1%	-14.7%	43.7%	18.8%

Discussion

Unlike the social cohesion and social disorganization theories, which predict that crime would increase or remain stable, the opportunity theory explains that as routine activities change, it causes a change in crime occurrences (either increase or decrease), depending on the balance between the crime type and the opportunity structure (Cohen & Felson, 1979; Hodgkinson & Andresen, 2020; Leitner et al., 2011). Curfews, lockdowns and stay-at-home rules imposed the most wide-reaching, significant and sudden

alteration of the lives of people in different parts of Fiji. Theoretically, it was expected that the huge increases in job insecurity and income losses may lead to subsequent rises in major crime offences in the country. In the Fiji Islands, curfews and restricted movement orders to effectively contain the spread of coronavirus triggered an immediate change that caused disruptions to the lives of thousands across the country. Apart from alteration to people's daily routine, the pandemic and its related restrictions have shifted the structure of organized crime, a trend quite common in other parts of the world during this pandemic (Ashby, 2020; Hodgkinson & Andresen, 2020; Miller & Blumstein, 2020; Stickle & Felson, 2020). Although relatively small, the current study shows a change in overall crime occurrences during the pandemic compared to offences for the same period 4 years preceding (2016-2019).

There is a significant increase in overall crime occurrences of 18.8% (1,728 cases), most likely caused by an enormous increase in offences against other acts, as shown in Table 1. The Public Health Act of Fiji (Fiji Government, 2020) was heavily breached during the curfew and restricted movement period. Disobedience against lawful orders (curfew breaches) is the most common offence, registering an astonishing 2,602 cases during the pandemic alone (see, Table 2). The study argues that people are not well-prepared for such abrupt restrictions that caused significant alterations to their day-to-day activities. An exponential increase in breach of curfew orders could be linked to the lack of awareness and familiarity with restrictions of such nature in Fiji.

Other notable rises in criminal activities during the pandemic include increases in offence(s) against the person, lawful authority and other offences against crime act. The offences against person category, including common assault, serious assault, assault causing actual bodily harm and criminal intimidation have considerably increased during the curfew period (see, Table 2). This is not unexpected, given that suitable targets and motivated offenders converge in similar time and space, leading to increases in the chances of assaults. The pattern of occurrence in this crime reflect frustrations, insecurities and anxiety among people, due to alterations in their lives due to the pandemic. This study shows a shift in crime patterns in the country, where offences relating to confrontations are becoming increasingly common. The paradigm shift nature of the crime trend in Fiji reflects offenders taking advantage of the climate of panic, anxiety and fear, created largely due to job losses, financial and health insecurities.

A significant drop in offences against public morality and property during the curfew period is observed (see, Tables 1 and 2). The routine activity theory explains that a declining trend in offences of such nature could be expected, as motivated offenders, suitable targets and lack of capable guardianship converge disproportionately (Hodgkinson & Andresen, 2020). Decreases in theft, burglary, aggravated robbery, rape and fraud during the

pandemic could be linked to fewer opportunities for offenders, as more and more people followed strict stay-at-home laws. Increased capable guardianship and the lack of a suitable target lowered the chances of crime against property in the country. The study argues that due to the changes in people's routine activities, the balance between a suitable target, motivated offender and capable guardian could not be met (Cohen & Felson, 1979; Leitner et al., 2011). It is also highly likely that increased precautionary and security measures taken up by businesses and property owners during this pandemic have decreased cases of burglary or theft in most areas across the country. An increase in property crimes, including theft and burglary were observed during Hurricane Hugo (Quarantelli, 2007) and Hurricane Katrina (Frailing & Harper, 2016) in the areas affected by the disasters. Hence, there is still a possibility of an increase in property crimes as the slow onset pandemic causes more social unrest and brings in financial insecurities. The study recommends a high resolution study of crime, extending the temporal scale of this study, once data is made available.

Crime Concentration across Major Divisions: Crime occurrences varied widely across major divisions. In line with the literature on crime concentration, our study found that containment restrictions have affected crime in different ways across communities. In terms of crime occurrences, only the central division showed a significant reduction in offences (i.e., -46.4%) during the curfew period. The decrease in crime in the central division could possibly be attributed to increased police presence and better security arrangements compared to other divisions in the country. Similarly, out of six major crime offence(s) categories, only offences against public morality (-41.7%) and property (-26.8%) showed a decreasing trend. All other major crime offence(s) categories and divisions interchangeably show variations in occurrence. The study detected cases in which certain crimes have increased in specific divisions only. For instance, offences against lawful authority have increased substantially (134.8%) in the east. Similarly, offences against other acts showed an enormous change in the south and west of Fiji. Although the central, east and north reveal the cases of curfew breaches, these are not accounted for in the percent change due to no previous cases for the same period in the last four years.

This study largely follows the routine activity theory (Cohen & Felson, 1979). However, the contextual analyses are motivated by the literature on crime concentration, which indicates that crime does not occur randomly in time and space (Campedelli, Favarin, Aziani, & Piquero, 2020; Weisburd, 2015), rather it accumulates in certain areas of a city. The variability in offence(s) is primarily influenced by the massive reduction in opportunities, increased supervision and limited human mobility. Additionally, the presence of negative stimuli – such as the stress associated with isolation and the financial and economic

uncertainty may lead to crime by increasing negative emotion response (Campedelli et al., 2020).

Differences in crime occurrences across major divisions also reflect the efficiency of restrictions in certain parts of the country. The difference in offence(s) across Fiji divisions reflect the structure and nature of society and communities which shapes overall crime distribution. Divisions that show an ongoing increase across major offence(s) categories most likely reflect vulnerable areas that were already under stress, and now experiencing more social unrest, in light of increased restrictions. It may also reflect the underlying socioeconomic structure of communities, which are worsening under a slow onset pandemic. Certain areas of the country experienced crime reductions, these are crime-sensitive and depend on various contextual characteristics of the communities.

Temporal variability in criminal offences: Major criminal offence(s) change with different time scales as well. Although the analysis period was relatively short, the study was able to denote changes across major criminal offence(s) on monthly and weekly time scales. The study notes a spike in criminal offences in April, the first month after curfew and restricted movement orders were implemented in Fiji. The gradual drop in offences after April reflect the potential change in people's behaviour and greater awareness of restricted movements that could be linked to people's inability to respond to abrupt changes in their day-to-day activities (see, Table 6 for monthly crime occurrence across major offence categories). Offences against other acts, made up of disobedience cases (curfew breaches) are the most common criminal activity in the analysis period. August sees a spike in crime, possibly due to the easing of restrictions in the country and a possible sign of lockdown fatigue. An increasing trend in offences against lawful authority, public morality, against person and property indicate an increase in opportunities for crime provided by reduced capable guardianship, motivated offenders and suitable targets (Hodgkinson & Andresen, 2020). Sunday records the highest number of criminal offences during the curfew period (see, Table 5). All major crime offence(s) peak closer to the weekends, indicating that more opportunities for offenders and victims to converge exist on Saturday and Sunday. The weekend is mostly a non-working day for people, and the likelihood of offence(s) against lawful authority, against the person, public morality and property are higher. An increase in offence(s) against property on Sunday, could be due to an increase in commercial property crimes, caused by lack of supervision. Criminal activities on Saturday are lower, probably due to increased monitoring and police patrolling in different areas over weekends. However, offences against other acts, are immensely high on Saturdays, indicating stay-at-home orders being ineffective, and the need to strategize such restrictions.

Existing tendencies in criminal offences: Variability in criminal offence(s) due to restrictions are common among countries. This study aligns with a

recent study in Australia (Payne & Morgan, 2020), which indicates that crime rates have changed dramatically during the pandemic but are unevenly distributed across different categories and types. Felson, Jiang, and Xu (2020) examined crime rates in Detroit during three periods: before restrictions and two periods under the restrictions. Their findings indicate an overall 32% decline in burglary under the restriction period. Crime rates in Sweden showed a massive change, following government restrictions; an early study by Gerell, Kardell, and Kindgren (2020) indicated an 8.8% total drop in reported crime. Ashby (2020) provided evidence of decreasing crime rates in eight large cities in the United States, concluding that arrests in these cities have reduced by approximately 50% following the strict stay-at-home orders.

While it may be too early to conclude any exact pattern in crime occurrences, it is believed that this study may be useful in guiding policy and practice. The study offers possible explanations, which may explain an increase in uncommon criminal offences following restrictions in Fiji. The shift in types and nature of crime could be due to disruptions in social and economic life caused by the pandemic. It is also believed that concerns of discomfort and frustration are probably driving an increase in cases of different assaults, attempted murders and criminal intimidation. Similarly, in a situation of limited freedom, financial distress, risk of economic backlashes, society becoming more disorganized and negative social influences, individuals may be subjected to increasing stress and negative emotions (Campedelli et al., 2020; Stickle & Felson, 2020). While this study does not look in great detail at each of these crimes, future research could look into the nature of such offences and observe if there are any changes in the victims targeted before and after the pandemic. Future research into this question may need to explore any changes with who is involved in these assaults during and before the pandemic can confirm the current patterns. It may also be helpful to investigate if this category of crime includes cases of domestic violence, which would be expected to increase during this crisis.

Conclusion

The present study focused primarily on the changes in crime immediately after public health measures, such as lockdowns, curfews and strict stay-at-home were implemented. At present, data is only available for the first few months of the pandemic – the first case in Fiji was confirmed approximately 30 weeks before the time of writing. Although providing new insights on the relation between the COVID-19 pandemic and crime, our study comes with some limitations. Firstly, there is a known bias between actual and reported crimes, and therefore it is crucial to approach the results that are primarily based on reported crimes with caution. Similarly, this study only considered a small aspect of crimes (i.e. assault does not

break down into gender-based crimes, burglary between residential and non-residential crimes).

Regardless of these limitations and numerous directions for future research, the current study contributes to the literature on exceptional events and crime through an ongoing pandemic in a small island developing state. The main purpose of writing this paper at such an early stage is to set up a baseline for future research in the region. This study has used primary data to identify potential trends in different types of crime, and future research should use these findings to identify more detailed research questions.

Overall, the present study finds, there is little doubt that the early effects of the pandemic on crime largely rest on the routine activity theory. The findings of this research are consistent with the predictions of the routine activity theory, which estimates crime rates to either increase or decrease during an exceptional event. The highest increase in offences is noted in crime against other acts, particularly in cases of disobedience of lawful orders, largely curfew breaches. However, the study shows evidence of decreases in offences against public morality (-41.7%) and property (-26.8%) during the curfew period. The study demonstrates that crime trends do not behave in the same way across different regions of the country and across different types of crime in the context of this pandemic.

As we begin to relax restrictions in Fiji and other parts of the world, mobility levels are expected to change, leading to changes in routine activities, and it is strongly believed that crime incidences will respond and vary accordingly. Given the evolving nature of the crisis, there is a need for replication and extension of the work initiated here. There is an urgent need to better understand this social phenomenon, hopefully making cities safer during the crisis and its aftermath.

Declarations***Availability of data and materials***

All data are open source and can be obtained from the Fiji Police Forces (<https://www.police.gov.fj/>) upon request.

Competing interests

The authors declare that they have no competing interests.

Funding

No external funding was used to support this study.

Authors' contributions

All authors read and approved the final manuscript; all authors were involved in data analyses and interpretations; all authors contributed intellectual input and read and approved the final manuscript.

Acknowledgements

The authors thank the Fiji Police Forces for access to the data used in this research.

References

- Ashby, M. P. J. (2020). Initial evidence on the relationship between the coronavirus pandemic and crime in the United States. *Crime Science*, 9(1), 6. doi:10.1186/s40163-020-00117-6
- Breetzke, G. D., & Andresen, M. A. (2018). The spatial stability of alcohol outlets and crime in post-disaster Christchurch, New Zealand. *New Zealand Geographer*, 74(1), 36-47. doi:<https://doi.org/10.1111/nzg.12182>
- Campedelli, G. M., Favarin, S., Aziani, A., & Piquero, A. R. (2020). Disentangling community-level changes in crime trends during the COVID-19 pandemic in Chicago. *Crime Sci*, 9(1), 21. doi:10.1186/s40163-020-00131-8
- Cohen, L. E., & Felson, M. (1979). Social Change and Crime Rate Trends: A Routine Activity Approach. *American Sociological Review*, 44(4), 588-608. doi:10.2307/2094589
- Cronin, S. J., & Neall, V. E. (2001). Holocene volcanic geology, volcanic hazard, and risk on Taveuni, Fiji. *New Zealand Journal of Geology and Geophysics*, 44(3), 417-437. doi:10.1080/00288306.2001.9514948
- Drabek, T. E. (1986). *Human system responses to disaster: An inventory of sociological findings*: Springer -Verlan New York Inc. <https://doi.org/10.1002/sres.3850050409>
- Felson, M., Jiang, S., & Xu, Y. (2020). Routine activity effects of the Covid-19 pandemic on burglary in Detroit, March, 2020. *Crime Science*, 9(1), 10. doi:10.1186/s40163-020-00120-x
- Fiji Government. (2020). Public Health (COVID-19 Response) (Amendment) Act 2020. Retrieved from <http://www.parliament.gov.fj/wp-content/uploads/2020/03/Act-9-Public-Health-COVID-19-Response-Amendment.pdf>
- Frailing, K., & Harper, D. W. (2016). *Crime and criminal justice in disaster: Carolina*. Academic Press, Durham, NC. ISBN 978-1-61163-739-7
- Hodgkinson, T., & Andresen, M. A. (2020). Show me a man or a woman alone and I'll show you a saint: Changes in the frequency of criminal incidents during the COVID-19 pandemic. *Journal of Criminal Justice*, 69, 101706. doi:<https://doi.org/10.1016/j.jcrimjus.2020.101706>
- Leitner, M., Barnett, M., Kent, J., & Barnett, T. (2011). The Impact of Hurricane Katrina on Reported Crimes in Louisiana: A Spatial and Temporal Analysis. *The Professional Geographer*, 63(2), 244-261. doi:10.1080/00330124.2010.547156
- Miller, J. M., & Blumstein, A. (2020). Crime, Justice & the COVID-19 Pandemic: Toward a National Research Agenda. *American Journal of Criminal Justice*, 45(4), 515-524. doi:10.1007/s12103-020-09555-z
- OCHA. (2011). *OCHA and slow-onset emergencies* Retrieved from <https://www.unocha.org/sites/unocha/files/OCHA%20and%20Slow%20Onset%20Emergencies.pdf>

- Payne, J., & Morgan, A. (2020). Property Crime during the COVID-19 Pandemic: A comparison of recorded offence rates and dynamic forecasts (ARIMA) for March 2020 in Queensland, Australia. doi: 10.31219/osf.io/de9nc
- Prelog, A. J. (2016). Modeling the Relationship between Natural Disasters and Crime in the United States. *Natural Hazards Review*, 17(1), 04015011. doi:10.1061/(ASCE)NH.1527-6996.0000190
- Quarantelli, E. L. (2007). The myth and the realities: Keeping the “looting” myth in perspective. *Natural Hazards Observer*, 31(4), 2-3. <https://hazards.colorado.edu/uploads/observer/2007/mar07/mar07.pdf>
- SOUSA-SANTOS, J. (2020, 31 JULY 2020). Profiteering from the pandemic: COVID-19, crime and vulnerability in the Pacific. *Policy Forum Pod*. <https://www.policyforum.net/profiteering-from-the-pandemic/>
- Stickle, B., & Felson, M. (2020). Crime Rates in a Pandemic: the Largest Criminological Experiment in History. *American Journal of Criminal Justice*, 45(4), 525-536. doi:10.1007/s12103-020-09546-0
- UNDP. (2020). COVID-19: Looming crisis in developing countries threatens to devastate economies and ramp up inequality. Retrieved from <https://www.undp.org/press-releases/covid-19-looming-crisis-developing-countries-threatens-devastate-economies-and-ramp>
- United Nations Pacific. (2020). *Socio-Economic Impact Assessment of COVID-19 in Fiji - Full Report and Recommendations*. Retrieved from Suva, Fiji: <https://www.pacific.undp.org/content/pacific/en/home/library/socio-economic-impact-assessment-of-covid-19-in-fiji.html>
- UNODC. (2020). *The impact of COVID-19 on organized crime (Research Brief)*. Retrieved from Vienna: https://www.unodc.org/documents/data-and-analysis/covid/RB_COVID_organized_crime_july13_web.pdf
- Weisburd, D. (2015). The law of crime concentration and the criminology of place. *Criminology*, 53(2), 133-157. doi:<https://doi.org/10.1111/1745-9125.12070>
- WHO. (2020). Fiji reaches COVID-19 milestone, but remains vigilant. Retrieved from <https://www.who.int/westernpacific/about/how-we-work/pacific-support/news/detail/05-11-2020-fiji-reaches-covid-19-milestone-but-remains-vigilant>
- Zahnaw, R., Wickes, R., Haynes, M., & Corcoran, J. (2017). Disasters and crime: The effect of flooding on property crime in Brisbane neighborhoods. *Journal of Urban Affairs*, 39(6), 857-877. doi:10.1080/07352166.2017.1282778
- Zahran, S., Shelley, T. O. C., Peek, L., & Brody, S. D. (2009). Natural disasters and social order: Modeling crime outcomes in Florida. *International Journal of Mass Emergencies and Disasters*, 27(1), 26-52.

Appendix – A

Table. The distribution of crimes across police stations - percent change in crime occurrences during the curfew period from the average of the last four years data for the same period (between Mar 31st and Sept 30th).

Geography		Normal Period					Curfew	%
Division	Station	2016	2017	2018	2019	Average	2020	Change
Central	TPS	1150	780	932	480	835.5	448	-46.4
Central Total		1150	780	932	480	835.5	448	-46.4
East	ED	666	523	542	502	558.2	667	19.5
East	EI	203	238	195	351	246.7	464	88.0
East	EK	133	107	121	95	114.0	180	57.9
East	EO	78	88	120	130	104.0	141	35.6
East	EV	85	97	70	65	79.2	79	-0.3
East Total		1165	1053	1048	1143	1102.2	1531	38.9
North	NA	126	183	160	127	149.0	281	88.6
North	ND	477	356	471	326	407.5	463	13.6
North	NN	79	87	127	55	87.0	70	-19.5
North	NQ	315	115	76	62	142.0	99	-30.3
North	NS	280	301	366	262	302.2	316	4.5
North	NU	81	102	97	81	90.2	173	91.7
North Total		1358	1144	1297	913	1178.0	1402	19.0
South	SA	262	238	189	164	213.2	246	15.4
South	SB	17	20	1	2	10.0	8	-20.0
South	SK	69	65	94	55	70.7	60	-15.2
South	SL	143	180	314	150	196.7	240	22.0
South	SN	344	294	421	376	358.7	526	46.6
South	SO	56	58	61	38	53.2	21	-60.6
South	SQ	450	316	275	302	335.7	419	24.8
South	SR	401	339	343	250	333.2	318	-4.6
South	SS	360	238	226	180	251.0	398	58.6
South	SU	8	7	5	1	5.2		-100.0
South	SV	1075	1004	1122	840	1010.2	1111	10.0
South Total		3185	2759	3051	2358	2838.2	3347	17.9
West	Border	27	102	33	34	49.0	5	-89.8
West	WA	298	333	262	269	290.5	393	35.3
West	WB	482	402	284	307	368.7	436	18.2
West	WI	67	59	41	70	59.2	76	28.3
West	WK	70	33	22	30	38.7	55	41.9
West	WL	1120	915	922	777	933.5	1369	46.7
West	WN	784	702	477	599	640.5	724	13.0
West	WO	138	172	111	100	130.2	111	-14.8
West	WR	178	212	238	156	196.0	192	-2.0
West	WS	324	447	351	407	382.2	593	55.1
West	WU	112	116	100	108	109.0	173	58.7
West	WV	54	64	30	40	47.0	72	53.2
West Total		3654	3557	2871	2897	3244.7	4199	29.4
Grand Total		10512	9293	9199	7791	9198.7	10927	18.8